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CA Technologies Product References

This document references the following CA Technologies products:

- CA Database Analyzer™ for DB2 for z/OS (CA Database Analyzer)
- CA Fast Check® for DB2 for z/OS (CA Fast Check)
- CA Fast Load for DB2 for z/OS (CA Fast Load)
- CA Fast Recover™ for DB2 for z/OS (CA Fast Recover)
- CA Fast Unload® for DB2 for z/OS (CA Fast Unload)
- CA Log Analyzer™ for DB2 for z/OS (CA Log Analyzer)
- CA Merge/Modify™ for DB2 for z/OS (CA Merge/Modify)
- CA Plan Analyzer® for DB2 for z/OS (CA Plan Analyzer)
- CA Quick Copy for DB2 for z/OS (CA Quick Copy)
- CA Rapid Reorg® for DB2 for z/OS (CA Rapid Reorg)
- CA RC/Migrator™ for DB2 for z/OS (CA RC/Migrator)
- CA RC/Query® for DB2 for z/OS (CA RC/Query)
- CA RC/Secure™ for DB2 for z/OS (CA RC/Secure)
- CA RC/Update™ for DB2 for z/OS (CA RC/Update)
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Documentation Changes

The following documentation updates have been made in the fourth edition of this documentation:

- **Tablespace Reports** (see page 89)—Added a description of the new Tablespace Eligible for PBG List (TS-EG) report.

The following documentation updates have been made in the third edition of this documentation:

- **List of Line Commands** (see page 45)—Added a row for the CLONE line command.
- **How to Apply Changes to Many Objects** (see page 63)—Updated to indicate that CARC/Query can now automatically apply changes to more than 255 selected objects.
- **Routine Reports** (see page 111)—Added description for the new Routine Package (RO-PK) report.
- **Table Reports** (see page 66)—The following table object report enhancements have been made:
  - The new CLONE line command can be executed on a table object to create its clone table. You can exchange data between the base table and the clone table by using the EXCHANGE command.
  - The Table Drop Impact (T-DI) report now displays history table information for temporal tables. You can execute all line commands for table objects from the history table line in T-DI reports.
- **Index Reports** (see page 70)—The following Index object report enhancements have been made:
  - Index List (I-L) report has a new column, Include. This column indicates whether an index is an include index. Only unique indexes support include columns.
  - Index Detail (I-D) report includes a new column, Sparse. This column indicates whether an index is sparse.

The following documentation updates have been made in the second edition of this documentation:

- **How to Create Customized Reports** (see page 25)—Updated the description of this process.
- **Generate Hierarchical Object DDL** (see page 62)—Updated to indicate that you can generate SPUFI compatible HDDL output.

The following documentation updates have been made since the last release of this documentation:

- Removed REXX and CLIST calls. This information is now detailed in SRCLIB(DBCLIST).
- **Recommended Region Sizes for Executing the HDDL Command** (see page 16)—Added this new topic that describes the region sizes to use when executing the HDDL command.
- **How to Apply Changes to Many Objects** (see page 63)—Added this topic that describes the new ALL command.
- **Table Reports** (see page 66)—Added new history table report options.
- Index Reports—Added new history table report options.
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**Index**

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Chapter 1: Introduction

This section contains the following topics:

Overview (see page 11)
Comprehensive Reporting (see page 12)

Overview

CA RC/Query is a comprehensive DB2 catalog management facility that helps you query, analyze, maintain, and manage DB2 subsystems. CA RC/Query generates reports that deliver a cohesive view of DB2 objects and their relationships.

CA RC/Query provides more than 140 reports. These reports provide integrated views of DB2 object details and their relationships. You can take immediate action from within reporting sessions by:

- Executing DB2 commands and utilities.
- Jumping to other products to perform tasks such as:
  - CA RC/Update to edit, browse, or copy table data; clone object definitions; alter, create, or drop DB2 objects; or review tablespace DASD statistics.
  - CA Database Analyzer to update catalog statistics, review tablespace DASD statistics, repair broken pages.
  - CA RC/Migrator to move whole environments between subsystems.
  - CA RC/Secure to grant or revoke authorizations or report on existing authorizations.
  - CA Plan Analyzer to run a quick EXPLAIN on a plan.
  - CA Plan Analyzer to BIND, REBIND, or FREE a plan.

Note: Appropriate licensing is required.

You can also directly invoke product functions and enhanced versions of DB2 commands. For example, from the Database Status Display report, you can start and stop databases, execute utilities in many databases, request more details, and much more.

This functionality alleviates the time-consuming task of manually developing and testing specialized queries.
Comprehensive Reporting

CA RC/Query gives you a complete array of reports on the DB2 system catalog. With full support of split screen mode, you can query multiple DB2 subsystems at the same time.

Horizontal and vertical scrolling makes it possible for you to view entire reports online. In addition to full ISPF scrolling support, scrolling commands are provided to help you move through reports easily and precisely. These commands include FIND, SORT, FREEZE (lock a column’s position in the report display), and EXCLUDE (remove a column from the report display).

After the report appears, no further DB2 resources are used. You can scroll the report without worrying about DB2 resources or catalog contention.

Note: For complete reporting flexibility, you can navigate between reports (and to other products) by entering line commands on report lines or by entering global commands and changing report options and selection criteria.
Chapter 2: Operational Considerations

This section contains the following topics:

- **Product Authorization** (see page 13)
- **Set Profile Variables** (see page 14)
- **Improve Performance of Detail and List Reports** (see page 15)
- **Interrupt Processing** (see page 15)
- **Command Processor** (see page 15)
- **Split Screen Support** (see page 16)
- **Direct Access Scrolling Feature** (see page 16)
- **Recommended Region Sizes for Executing the HDDL Command** (see page 16)
- **CA Database Analyzer Jump Command** (see page 17)
- **Selection Criteria** (see page 17)
- **Compound Selection Criteria** (see page 18)
- **Working with Long Object Names** (see page 18)

**Product Authorization**

You can grant or revoke authorization to the Query Services plan of CA RC/Query. This plan lets the user execute CA RC/Query.

**Note:** For more information about granting authorization using the Product Authorization facility, see the *General Facilities Reference Guide*.

Before running CA RC/Query, review the following additional authorization requirements:

- To grant the user EXECUTE authority on the Utility Manager plan, enter G next to the Utility Manager entry (found in the Database Analyzer category).

  **Note:** For more information, see the *CA Database Analyzer User Guide*.

- To perform dynamic SQL, the user might need SELECT authority on DB2 catalog tables. To grant this authority, enter G next to the DB2 Catalog entry (found in the General category).
Set Profile Variables

The Profile facility lets you update the variables for the general execution parameters that are specific to CA RC/Query processing. These variables act as the default execution values, and can be overwritten by users as needed.

**Note:** You can also specify global profile values that apply to all installed CA Database Management for DB2 for z/OS products. These options include execution libraries, JOB statement specifications, print parameters, screen colors, and usage language options. For more information about defining the global profile parameters, see the *General Facilities Reference Guide*.

You can define defaults for using CA RC/Query so that your session is customized to address your needs most accurately. For example:

- Specify print parameters (whether to print pages that display SQL statements in batch or online reporting).
- Specify processing options for CA RC/Query reports. For example, how many view levels to include for Object Dependency reports, whether to use CA Technologies utilities, whether to display customized reports, and so on.

**Follow these steps:**

1. Enter **PROF** (PROFILE) in the command line on the CA RC/Query Main Menu and press Enter.
   The CA RC/Query Profile Menu panel appears.
2. Select the CA RC/Query profile option and press Enter.
   The CA RC/Query Profile Variables panel appears.
3. Review the default profile settings and make changes as needed.
   **Note:** For fields that have a defined list of valid values, see the online help.
4. Press F3 (End) to save your selections and return to the Profile panel.
Improve Performance of Detail and List Reports

To improve the performance of detail and list reports, use the Full Detail and the Max Lines CA RC/Query profile variables.

When Full Detail is set to N (No), object counts are omitted from the detail reports and report performance is improved. For the Column Detail report, the RULE, INDEX, STATS, and FLDPROC values are omitted. These counts are determined using SELECT COUNTS, which can require considerable processing time.

**Note:** You can also use the ATTN key to interrupt processing on a long-running detail report.

When only a general inquiry is needed, set a limit on the number of objects that are displayed for list and detail reports using the Max Lines profile variable. The default is to display all selected objects. Setting a Max Lines value can also be helpful when you want to print the report.

Interrupt Processing

The capability to interrupt a long-running report is provided. The interrupt service is invaluable because it lets you halt a long-running SELECT statement in an orderly fashion. Otherwise, you may have to cancel your session.

To interrupt a data retrieval process, press the ATTN key or the equivalent keystrokes on your system.

When processing is interrupted, the data retrieved before the ATTN key was pressed appears. You might have to press PA2 to refresh the screen data.

**Note:** Any SQL request that is currently executing finishes before the ATTN takes effect.

Command Processor

The command processor works only on local DB2 subsystems. When changing the LOCATION field on any of the CA RC/Query panels to report remote objects and you issue commands such as START or STOP, these commands are issued against the LOCAL subsystem (not a remote subsystem).
Split Screen Support

CA RC/Query fully supports split-screen mode. The number of lines in the display area is adjusted according to the change caused by the split screen. All vertical scrolling functions are adjusted to the correct number of lines in the report area.

Direct Access Scrolling Feature

To scroll through lines of a displayed report, issue one of the following commands in the COMMAND area:

■ UP n
■ DOWN n

Note: Some reports allow you to accomplish the same thing by overwriting the LINE or FRAME number.

If a report has more than 100,000 lines or frames, the feature appears on the panel as Line xxxxxx or Frame xxxxxx. You can access a specific line or frame by entering the number in the input area.

If you enter anything other than a numeral in the input field, then the first available line or frame appears at the top of the display area. If you enter a value greater than the maximum number of lines or frames, the last line (or frame) appears at the top of the display area.

Recommended Region Sizes for Executing the HDDL Command

The IEALIMIT or IEFUSI exit routine modules provide IBM-supplied default limits. If these defaults are not changed, the following region sizes are recommended to execute HDDL successfully:

<table>
<thead>
<tr>
<th>Region Size</th>
<th>DB2 Object Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 KB or 0 MB</td>
<td>Unlimited storage available. Any object with any number of dependencies.</td>
</tr>
<tr>
<td>&lt; 0 MB &lt; REGION &lt; 16 MB</td>
<td>Small and medium sized objects:</td>
</tr>
<tr>
<td></td>
<td>■ Small (objects that have up to 100 dependent objects).</td>
</tr>
<tr>
<td></td>
<td>■ Medium (objects that have up to 1000 dependent objects).</td>
</tr>
</tbody>
</table>
Region Size | DB2 Object Size
---|---
< 16 MB ≤ REGION < 32 MB | Large objects (objects that have more than 1000 dependent objects).
<32 MB ≤ REGION < 2047 MB | Any DB2 object with more dependencies.

More information:
[Generate Hierarchical Object DDL](#) (see page 62)

**CA Database Analyzer Jump Command**

A jump command to CA Database Analyzer is not supported.

**Selection Criteria**

Many fields accept selection criteria. Selection criteria let you specify a portion of a character string. We then search for all occurrences that match the selection criteria. Selection criteria can be an asterisk (*), a percent sign (%), or an underscore (_), as described in the following section:

*  
  Selects all objects.

%  
  Appears at any location in the name and signifies that zero or more characters can occupy that position to the next character and all remaining positions to the end of the name. For example, DSN% retrieves all names that start with DSN. DSN%06 retrieves all names that start with DSN, then any characters up to 06, and then any remaining characters to the end of the name.

**Note:** The % symbol works as an actual wildcard. For example, DSN%06 retrieves all names starting with DSN, then any characters up to 06.

_  
  Indicates that any character can occupy that position. The underscore character can be repeated at multiple locations within the field. For example, DSN_B__ matches DSND804 and DSNXBPH.

If a character does not appear at the underscore's location, then the match fails. This is different from the percent (%) character, as an underscore does not match zero characters.
Compound Selection Criteria

You can enter any combination of selection criteria in the header's control center. If the Item Name, Creator, Qualifier, or Grantor fields contain selection operators (% or _), they are added as LIKE conditions to the internal SQL statement's WHERE clause. Any extended query is added to the end of the SQL statement's WHERE clause. You can use the Extended Query Facility (EQF) to set up extensive WHERE conditions to control the list of objects or reports displayed.

Sample extended queries are supplied with CA RC/Query.

Working with Long Object Names

When your object names are longer than the display area, you can scroll and expand them to view or input data as follows:

- For fields that cannot be scrolled, such as header fields, place your cursor in the field to be expanded and specify the EXPAND command (typically, using a PF key setting).
- For scrollable fields, the greater than (>) symbol appears for fields with truncated values when the column is not wide enough to display the long value. You can view or edit this data using scroll commands or the EXPAND and SETWIDTH commands.

Note: For more information about these commands, enter a question mark (?) on the command line.
Chapter 3: Generating Reports

This section contains the following topics:

- Report Types (see page 19)
- How to Generate Reports (see page 23)
- How to Jump Between Reports Using Cursor Select (see page 24)
- How to Create Customized Reports (see page 25)

Report Types

You can generate the following types of reports for DB2 objects:

- List
- Detail
- Object dependency
- Object to object
- Referential integrity
- System
- User authorization
- Plan and DBRM
- Package and collection
- History

List Reports

For certain DB2 objects, you can use selection criteria to display a limited list of those objects. These reports are often a good starting point for a report session. You can first list the objects that you are interested in, and then view detailed information about those objects in the list. You can also make the object list as specific or general as you like by inserting selection criteria in the item name and creator header fields.

For example, you can display a list of tables that are created by a certain user before deciding to display a Table Detail report for one of the tables listed. This processing lets you select from a list of tables in case you did not know the exact name of the table (needed for the Table Name header field) to display a Table Detail report specifically for that table.
Detail Reports

The Detail reports present detailed information for an object or multiple objects on a single panel. Information is extracted from multiple catalog tables, if necessary, to present all the information about an object.

For example, the Table Detail report includes creation and storage information, the number of synonyms for the table, and more. The Column Detail report identifies the column type, length, null value, LOW2KEY and HIGH2KEY values, and DB2 catalog distribution values. You find:

- The associated table or view name.
- The total number of columns in the table or view.
- Where the column occurs within the table or view.
- The foreign and primary keys.
- Whether it is used in an index.

Object Dependency Reports

The Object Dependency reports reveal the hierarchy of DB2 data structures. This information is necessary when assessing the effects of object deletion or alteration on dependent objects or when planning migration strategies. The Object Dependency reports provide an overall view of the system.

Two features can be used to customize your Object Dependency reports: View Levels and Qualifiers.

- The View Level feature lets you limit the number of view levels included.
- The Qualifier feature lets you include or exclude creator IDs. (On other reports, the Qualifier feature toggles the display of the createdby/BOUNDARY fields.)

Object to Object Reports

When you want specific cross-reference information about another object that is related to the object currently displayed, use an Object-to-Object report. These reports let you display information from multiple perspectives.

After viewing a Table Detail report, for example, if you need more information about the indexes that are defined on a table after viewing the table you need more information about the indexes that are defined on the table. To learn more about those indexes and how they relate to the table, you could use the Table Index report. The Table Index report presents index information as it relates to the tables selected.
There are many other Object-to-Object reports. The Table Column report lists column and table information for the tables you select. The information provided in this report helps verify column definitions across tables.

**Referential Integrity (RI) Reports**

Before making changes to tables, you must know their parent/child relationships so you can assess the effect of additions or deletions. The Referential Integrity reports display the information necessary for monitoring and maintaining referential integrity. Referential integrity enables you to define the relationship between a primary key (a selected unique key) in one table and a key in another table, called the foreign key.

To define the relationship between two tables using primary and foreign keys, you must make referential rules. Referential rules help ensure referential integrity. After you have defined the relationship between the keys, DB2 helps ensure that changes to data are consistent between parent and child tables. (The table whose primary key you are using for reference is called the parent table. The table that calls upon this reference through a foreign key is called the child table.)

**System Reports**

The System reports contain detailed statistics about DB2 utilities, including when the last load, reorganization, or image copy was performed. It also describes the volume and data set used. This information helps you keep track of the execution status of a specific utility and assists in DASD space management.

**User Authorization Reports**

User Authorization reports provide valuable security information about the system, databases, tables, plans, and resources; all sorted by user ID for the selected object. Authorities for objects such as packages and collections are also reported on.

Additionally, User Authorization reports that list information by object name, are offered for many objects. For example, the Table User Authorization report displays the same information as the User Table Authorization report, but sorts the information by table name, instead of the user name.

The variety of User Authorization reports lets you display the information from the correct perspective for a specific task.
Plan and DBRM Reports

The Plan reports display an abundance of information concerning DB2 application program plans. For example, you can:

- Display basic or detailed information concerning one or more application plans.
- Display detailed DB2 performance and optimization information about statements in an application plan.
- List the actual SQL statement text that is contained in an application plan.
- List the SQL in the DBRMs for an application plan.

Other Plan reports give you detailed information about plan dependencies, user authorizations, and DBRMs.

The DBRM reports display all the plans for which a DBRM has been defined. They also provide a report listing the actual SQL statement text that is contained within the specified DBRMs.

Package and Collection Reports

The Package reports display the same information for packages that the Plan reports present for plans. Additionally, the package connection report lists the system connection types for your packages and shows whether they are enabled or disabled.

The Collection reports show information about collections, which are groups of packages. The Collection List report presents basic information about collections. The Collection Package report lists the packages in the collections you specify. Other collection reports, however, provide information about collection dependencies and user authorization information for the packages in a collection.

More information:

Plan and DBRM Reports (see page 22)

History Reports

The History Table reports display the information available in the DB2 system catalog concerning DB2 history tables and their related objects.
How to Generate Reports

As a database administrator (DBA), you want to query, analyze, maintain, and manage DB2 subsystems using information that is obtained from the DB2 catalog. You can generate reports that provide integrated views of DB2 object details and their relationships. CA RC/Query lets you view items from the DB2 systems catalogs through the controlled environment of an ISPF/DB2 application program.

From any report, you can select a variety of options to generate more detailed information about such attributes as an object’s relationship to other objects in the DB2 subsystem. You can also build new reports directly from the currently displayed information, drill down for more detail, or move laterally for a broader view. Once you have the information you need, you can:

- Take appropriate action by executing DB2 command and utilities
- Immediately jump to another report or menu alleviating the time-consuming task of manually developing and testing specialized queries.
- Print the report results

Most reports also let you enter selection criteria to further customize the report results and specify extended queries. From within any reporting session, you can select the DB2 object you want to report on, and specify other selection criteria.

Follow these steps:

1. Specify 1 in the Option line on the CA Database Management Solutions for DB2 for z/OS main menu.

   The CA RC/Query Main Menu panel appears. This panel lists all the available DB2 objects that can be reported on and is the starting point for requesting your first report in any reporting session. Once you are familiar with how the header fields are used to specify selection criteria and generate various reports, you may want to generate your initial report directly from the header fields on this panel.

   **Note:** This is the only panel that lists all the object codes and is the only panel where you can specify the Location and DB2 SSID.

2. Specify the DB2 object code on which you want to report and the report option for the selected object, and press Enter.

   **Note:** Leave the report option blank to see all options for an object.

   The object report menu appears. The report menus list the report options that are available for each DB2 object. After the initial report is generated, use line commands for generating additional reports about related objects.

3. Select a report type from the available options, and press Enter.

   The requested report is displayed. Enter ISPF, product, or TSO commands as needed. You can also assign commands to the function keys, and then press the appropriate function key to execute a command.
How to Jump Between Reports Using Cursor Select

Example: Jumping to Another Report or Menu by Changing the Selection Criteria

The selection fields let you identify the exact report you want. For example, you can display a table list report for all tables beginning with the letter D and having a creator beginning with the letter D by entering T in the DB2 object field, L in the Option field, and D% in the Item Name and Creator fields.

You can then jump to a Table User Authorization report for all tables beginning with A that have creators beginning with A and grantors (of the privilege) starting with A by changing the Option field to UA, and the Item Name, Creator, and Grantor fields to A%.

How to Jump Between Reports Using Cursor Select

You can use shortcut and line commands for jumping between reports and executing commands on a selected object.

Use the Cursor Select feature to select a new Item Name for the header by placing the cursor over the new name you want and pressing Enter. Cursor Select transfers the token at the cursor to the Item Name field. All other header fields are unchanged (unless you change them) and are used in generating the new report.

Cursor Select can also be used with primary commands. Enter the command in the command line and select the appropriate item with the cursor. The command executes using the information in the header, including the new Item Name selected.

The difference between Cursor Select and line commands becomes more apparent as you learn how to use Cursor Select. You are able to decide which method is appropriate in a given situation.

You can enter a command in the command line and then select the appropriate item with the cursor by using Cursor Select.

Note: Cursor select and line commands work differently. Select the method to use depending on your needs. Cursor Select is limited to changing the value in the Item Name field. All other header fields are unaffected unless you change them. For example, suppose you have a Table List report with B% in the Creator field. Each line in the report contains creator, table, tablespace, and database information for the listed table. If you change the Option field to D (Detail), place the cursor on one of the listed tables, and press Enter, a Table Detail report generates for all tables having the name you selected with the cursor and a creator beginning with B. The creator, tablespace, and database information in the line is not used. If, from the same Table List report, you enter the D (Detail) line command in one of the CMD lines, a detail report is generated for only a single table. The line command picks up all the identifying information for the table shown on the line (in this case creator, tablespace, and database), regardless of the identifying information specified in the header.
Follow these steps:

1. Make any changes in the header (other than the Item Name field).
2. Enter the command in the Command field to execute a primary command.
3. Place the cursor over the name you want entered in the Item Name field and press Enter.

The name is inserted in the Item Name field and the requested report appears or the requested command executed.

Example: Display an Index Detail Report

If you are viewing a database object dependency report that includes tablename SYSCOPY, you can use the cursor select to display an index detail report for SYSCOPY.

Follow these steps:

1. Enter the new object type I (Index) in the DB2 Object field.
2. Enter the new option D (Detail) in the Option field.
3. Place the cursor over the name SYSCOPY, and press Enter.

The Index Detail report for SYSCOPY appears.

Remember that you do not have to change the DB2 Object or the Option. You can leave the Object and Option values the same and select another name. However, the name you select with the cursor must be of the same object type displayed in the DB2 Object field when you press Enter. The report type displayed must also be valid for the Object type selected.

If you choose an object with a creator different from the one displayed in the Creator field, you must enter that creator ID in the Creator field, because the creator ID is not retrieved as part of the Cursor Select process.

How to Create Customized Reports

CA RC/Query lets you create customized report formats and control their usage. You can save, display, and remove customized reports as needed. After the saved customized reports are displayed, you can edit and delete them as needed.

Important! You can create customized report formats only with list type reports that contain definite columns.
Follow these steps:

1. Set the Saved Reports profile option to Y (type PROF on the Command line and press Enter). This option lets you display customized reports if they exist when a report is generated.

   **Note:** Only one report format can be saved per user ID, report, and DB2 version. To force CA RC/Query to use only default formats, set the Saved Reports profile option to N.

2. Generate any list type report that contains definite columns. For example, specify T (table) for the DB object, and L (list) for the report option.

   The requested report displays.

3. Customize the generated report using standard scrolling commands (like EXCLUDE, SHOW, FREEZE, or UNFREEZE). For example, from the table list report, specify the following commands to create a customized report version:
   - EXCLUDE CREATOR to hide the creator column.
   - FREEZE TBLSPACE to move the column up on the report display.

4. Type SAVE on the command line.

   The customized report format is saved and stored in a table. The table includes the user ID, report type, sub type, and DB2 version. See the following example:

   ```sql
   CREATE TABLE ABC.PTRCQ_SAVED_RPTS
   (USERID CHARACTER(8)
    ,TYPE CHARACTER(2)
    ,SUB_TYPE CHARACTER(2)
    ,VERSION CHARACTER(8)
    ,COL_ORDER SMALLINT
    ,RPT_INFO CHARACTER(20)
    ,COLNAME VARCHAR(30)
   )
   IN PTDB.ABCRCQTS;
   ```

   If you save a new version of a customized report, the old format is replaced with the new report format.

   **Note:** To clear the customized report format temporarily, use the CLEAR command. This command has no effect on the saved customized report. However, it lets you make more changes and see the regenerated report without affecting the saved customized report.
5. (Optional) Create a unique index as shown in the following example:

   Important! A unique index is not required, however we strongly recommend that you create one.

   ```sql
   CREATE UNIQUE INDEX ABC.PTRCQ_INDEX_RPTS
       ON ABC.PTRCQ_SAVED_RPTS
       (USERID ASC,
        TYPE ASC,
        SUB_TYPE ASC,
        VERSION ASC,
        COL_ORDER ASC);
   ```

6. To manage saved reports, complete the following steps:
   a. Type **REPORTS** (or **REP**) on any command line.

      The Customized Reports panel displays for your user ID. From this panel, you can specify whether a column is excluded or shown, frozen or scrollable, and can change column names. All columns that are frozen are displayed first. If you freeze more than one column, they display in order, based on their position in the original report. You can also move columns within the display.

   b. Edit or delete the saved report formats as needed. For example, you can:
      - Exclude a column.
      - Change the column order or block of columns using freeze or move before and after commands.

         **Note:** All columns that are frozen are displayed first. If you freeze more than one column, the columns display in order, based on their position in the original report.

      - Change the column name by typing over it.

      For example, to place a column named **STATTIME** as the second viewed column, type **F** next to the column and press Enter. The Frozen flag toggles to **YES**, freezing the column, and moving the column up in order.
Chapter 4: Line Commands

This section contains the following topics:

- **Line Commands Usage** (see page 29)
- **Benefits of Line Commands** (see page 30)
- **The CMD Field** (see page 32)
- **Default Objects for Line Commands** (see page 32)
- **Consistent Line Commands Use** (see page 33)
- **Types of Line Commands** (see page 34)
- **Processing Considerations for Line Commands** (see page 34)
- **Line Command Help** (see page 40)
- **Line Command Services Help Screen** (see page 41)
- **How to Execute DB2 Utilities** (see page 43)
- **User-Defined Line Commands** (see page 46)
- **User-Defined Line Commands Usage** (see page 61)
- **Generate Hierarchical Object DDL** (see page 62)
- **How to Apply Changes to Many Objects** (see page 63)

**Line Commands Usage**

Line commands entered on individual report lines let you generate multiple reports, access specific functions in our products, and execute DB2 commands without using menus or the header fields.

You can also use line commands to execute utilities, such as COPY. This saves you time by providing direct access to the utilities.

Report line commands give you specific control over the reports generated. You can view any number of reports without having to return to the original report. For example, you can request an Object Dependency report for database DSNDB04 and at the same time request a Referential Integrity Primary Key report for table ADDRESS. The reports are generated in sequence.
Reports generated through line commands are saved so they can be reviewed by means of the PATH command without having to be regenerated.

Global line commands let you access our product functions, including those of the built-in Utility Manager, for objects selected from a single report screen. For example, if you are in the Database Table Inquiry report, you can do either of the following:

- Enter UTIL next to a database name to update the statistics for the database in the system catalog by accessing the Utility Manager.
- Enter TEMPL next to a table object to jump directly to CA RC/Update to template the table using the Template feature.

Note: To view available line commands for an object, enter ? on the CMD line next to the object.

To control the processing of object names as it pertains to case sensitivity, use the MATCHCASE ON or OFF command. Specify this command in the command line on any panel where the specified object name (like tables, indexes, aliases) is effected.

Note: Unlike the Matchcase profile variable, you do not need to exit the product for the change to become effective. The MATCHCASE command is effective immediately.

To process underscores in tables, indexes, aliases, synonyms, views, or columns as wildcards or as regular characters, use the WILDCARD command.

**Benefits of Line Commands**

Benefits of using line commands include:

- **Easier Navigation**—Moving between CA RC/Query reports and other CA products is simplified, especially for the new user. For example, a user does not need to memorize which reports are available from a report. Report options available for a report’s DB2 object are listed at the bottom of the screen. Report options available for the default object of the current line or for the selected help object are listed on the Line Command Help Services screen.

- **Header Changes Unnecessary**—You can access various reports from one report without changing the DB2 Object or Option fields. This increases flexibility because different reports can be generated from one screen, rather than one report generated per screen.
Benefits of Line Commands

- CA RC/Query as the Control Center—Displays detailed information about your DB2 catalog. From a report, you might need to alter an object’s statistics.

  Global line commands function as a springboard from CA RC/Query to any other CA product and then back again. For example, you can view a database listing from CA RC/Query, enter a single global line command, view the selected database’s statistics in CA Database Analyzer, and return to the database listing again in CA RC/Query.

- Fast Navigation of Sub-reports—The sub-reports generated with line commands are stored. With a single command (PATH), a generated sub-report listing appears so you can select the sub-report you want to review. You do not have to navigate back up the sub-report chain.

Although header changes, primary global commands, and cursor select can be used to perform many of the same functions, you might find line commands more convenient.

Easy Navigation

Line commands simplify moving between reports and our products, especially for the new user. You do not need to memorize which reports are available from a given report. All possibilities are detailed in the line command help screens.

Streamlined Report Access

Line commands let you access various reports from one report without changing the Object or Option fields in the report header or accessing object menus. This way, different reports can be generated from one screen.

Fast Report Review with PATH Command

Reports that were generated with line commands are remembered. Use the PATH command to view a listing that traces the path from the current report back to the original report. Then, to eliminate overhead and decrease response time, select from a list of generated reports that can be reviewed directly from memory, without having to move back up the chain of reports.

The PATH command also helps you keep your place in the hierarchy of reports by identifying how many levels each report is removed from the original report.
Online or Batch Reporting

Reports can be printed online or in batch mode. When printing online, you can print the whole report or only the current screen.

Batch reporting reduces resource consumption during peak hours while still delivering the necessary reports. Users can write report requests to data sets for batch execution later. Batch report requests are selected from a list of reports that can be made as specific as needed.

A selection queue on the Batch Report Selection panel holds the report requests and can be displayed or changed at any time before the request is made. You can also use extended queries to customize reports for batch reporting. Any report created online, including customized reports, can be generated in batch mode.

The CMD Field

The CMD field lets you perform a specific action. This field appears for every report (except the System DSNZPARM and System Communication Database reports). The format of the CMD field varies according to the type of report displayed. Column format reports can display multiple objects on one screen. Detail format reports display one data item at a time. The CMD field appears as a column on column format reports and as a single command line on the detail format reports.

For column format reports, a line command is available next to each report line.

The CMD field consists of a single CMD line for each data item on a detail report. The CMD field for both types of reports is eight bytes long, so global commands can be entered.

Default Objects for Line Commands

The CMD lines correspond to default objects. The default objects are listed to the right of each CMD line for a column format report and listed as the leftmost item for the detail format report.
The following sample illustrates the corresponding default objects for a column format report. The default object is the first displayed object from left to right.

In this example, the objects to the right of the CMD lines are a tablespace or table. These are the two default objects for the report.

<table>
<thead>
<tr>
<th>CMD</th>
<th>NAME</th>
<th>CREATOR</th>
<th>CREATEDBY</th>
<th>DATABASE</th>
<th>N. ROWS</th>
<th>N.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DSN8S61D</td>
<td>USER02</td>
<td>USER02</td>
<td>DSN8D61A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEPT</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DSN8S61E</td>
<td>USER02</td>
<td>USER02</td>
<td>DSN8D61A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMP</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DSN8S61P</td>
<td>USER02</td>
<td>USER02</td>
<td>DSN8D61A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACT</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMPPROJACT</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>74</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROJ</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROJACT</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td>77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DSN8S61Q</td>
<td>USER02</td>
<td>USER02</td>
<td>DSN8D61P</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MAP_TBL</td>
<td>USER020</td>
<td>USER02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DSN8S61R</td>
<td>USER02</td>
<td>USER02</td>
<td>DSN8D61A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Options: D=Detail, L=List, P=Plan, T=Table, O=Object Dependency, UA=User Auth, PK=Package, DI=Drop Impact, LC=LISTCAT, LR=Lob Relationship, PL=Partition List

The default object for the CMD line next to DSN8S61P is a tablespace. The default object for the CMD line next to ACT is a table.

Default objects are important when you use line commands because you can enter a line command for the default object or request a line command that is valid for a different object.

**Consistent Line Commands Use**

The primary object and its first secondary object appear on separate lines. This eliminates the confusion of which object will be used when generating a report from a line command is eliminated. You do not have to qualify which object to use when using line commands on the primary object line.

For example, if you generate a Table Column report, you will find that the primary object and the first secondary object are on separate lines. Therefore, if you wanted to generate a Column Detail report for any of the secondary objects, all you would have to do is enter D on the line for those objects. The line command is consistent for all objects.
Types of Line Commands

You can specify primary commands in the header area command line on the report panels. You can also specify line commands in the CMD field column (which also appears as a single command line on the detail format reports). Many commands can be entered in the command line or CMD field.

Note: To see a listing of valid line commands for any report, enter ? in the CMD field to display the Line Command Services help panel. This panel also provides explanations for how commands are categorized.

The following types of line commands are available:

Global line commands

Allow quick access to any licensed CA product. When you use global line commands, pertinent information is carried from the report to the inter-product panel.

Report line commands

Allow you to access other CA RC/Query reports from a single report (without leaving the current report). Available options for the report’s DB2 object are listed at the bottom of each report panel. Additionally, the Line Command Help Services panel lists report options available for the default object of the current line or for the selected help object.

Note: Each report generated with report line commands since the original report is called a sub-report.

CA RC/Query line commands

Include commands such as DDL, FORM, DISPLAY, and LBIND. The format of this command depends on the command that you want to use.

Processing Considerations for Line Commands

A command hierarchy is established for CA RC/Query. The command line is at the top and the CMD field is at the bottom.
A primary command entered in the command line overrides any header or line command information. Header information (and cursor select) overrides any line command information.

For example, if you specified line commands in the CMD field (without pressing Enter) and then entered MAIN in the command line, the line commands are ignored and the Main Menu appears.

**Note:** The CMD field does not have a hierarchy for report and global line commands. Line commands are processed in the order displayed on the report; any combination of line commands can be entered in the CMD field.

### Levels

You can enter multiple line commands from one sub-report, and other line commands from the next sub-report, and so on. Therefore, levels are used to indicate which sub-report is being displayed.

The level field represents how many levels away the generated report is from the base level report:

**Base Level (Level 00)**

Any report generated by using cursor select or by entering information in the header field is at base level (level 00).

**Level 01 - 99**

Reports generated by entering report line commands are specified by a level number. For example, a report generated from base level by using line commands is at level 01; a report generated from level 01 is at level 02; and so on.
The LVL field shows how far you have navigated from the base level. Any report generated from the base level is at level 01.

You can access as many levels as you like. For example, you can use the UA line command to generate a Table User Authorization report, which will be at level 02. The following textual illustration shows progression through levels of reports:

Press PF3 (End) to display a previous level. When you re-access a previous report, you incur no extra overhead because the report has already been generated.

The concept of report levels is important when you access sub-reports or use the PATH command.

**Sub-Reports**

The report at the base level is called the original report. In the previous example, Table Detail and Table User Authorization are sub-reports of the original report, Table List.
There can be multiple sub-reports within a level. Multiple reports generated from a single report share the same level number, as indicated by the LVL field.

For example, if three report line commands are entered from the Table List report (original report), there will be three sub-reports at level 01. The sub-reports will be at the same level because they were all created by line commands entered from the same original report. The following example shows this concept.

<table>
<thead>
<tr>
<th>Original Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter Command, Press Enter</td>
</tr>
<tr>
<td>▼</td>
</tr>
<tr>
<td>Sub-Report 1</td>
</tr>
<tr>
<td>PF3</td>
</tr>
<tr>
<td>Sub-Report 2</td>
</tr>
<tr>
<td>PF3</td>
</tr>
<tr>
<td>Sub-Report 3</td>
</tr>
<tr>
<td>PF3</td>
</tr>
</tbody>
</table>

The previous illustration shows that:
- If line commands are specified, press Enter to have those commands processed.
- If no line commands are entered from a sub-report, press F3 (End) to continue the processing.
- After all sub-reports within a level have been processed, the previous level's report appears when you press PF3 or 15 (END). In this example, all the level 01 sub-reports were processed before redisplaying the previous level, the base level report.
On a larger scale, you can have multiple levels, each with multiple sub-reports. This is shown in the following illustration:

After all sub-reports within a level have been processed, F3 (End) redisplaysthe previous level. F3 (End) continues to backtrack through the sub-reports until the original report reappears.

The PATH command is an alternative to using F3 (End) to re-access generated reports.

**PATH**

The PATH primary command traces the reports by level from the current report back to the original report. This lets you quickly select a previous sub-report from the listing.

To display the level listing, enter **PATH** in the command line. The Path screen appears. All fields, except the S (Selection) field, are for display only.
Fields on the Path screen are as follows:

**LVL**
Displays the number of levels the generated report is away from the base level. For example, 00 represents the base level, which is always the original report. In the example, the original report was a Table List (T-L) report. The increasing numbers indicate the levels removed from the base level. The number 01 represents the first starting level. In this example, 01 represents that a Table Detail (T-D) report was generated from the original report. Any level above 00 indicates sub-reports. For example, level 02 indicates that the sub-report generated from the Table Detail report (level 01) is a Database Detail (DB-D) report.

**OBJECT**
Displays the object type. For example, T for table and DB for database.

**OPTION**
Displays the report option specified for the report. For example, L for list and D for detail.

**ITEM NAME**
Displays the item for which the report was generated. In the example, all tables (*), table DEMO2, and database JSDB were selected for each report.

**CREATOR**
Displays the creator of the item

**WHERE**
Indicates whether the Extended Query Facility (EQF) was used.
- Yes—EQF was used.
- No—EQF was not used.

**S (Select)**
Selection line. Valid values are S and ?. If you do not want to select from the PATH screen, press F3 (End) to exit and return to the current report.
- S—Enter S to select the report. Only one selection is allowed. In the example, the Table Detail report is chosen. When you enter S, that report appears. The PATH is cleared of any higher entries when you select a lower level or when you re-access a previously generated report through F3 (End). In the example, the Table Detail report at level 01 is selected. When the Table Detail report reappears, entering the PATH command will display only levels 00 and 01 because the higher level sub-report (level 02) has been deleted from the PATH.
- ?—Enter ? to display object help for the selected option. For example, if you entered a question mark next to the Database Detail report (DB-D), the Database Detail help panel appears.
Line Command Help

Line command help is available from any report. Report options for the report's DB2 object are displayed at the bottom of each report screen except the System DSNZPARM [SY-Z] and System Communication Database [SY-CD] reports. If you need report options for the current line's default object, or for another object, or any other help with line commands, you can enter help line commands.

Report options for the report's DB2 object are listed at the bottom of each report screen.
Display Available Line Commands for the Current Line

You can display the available line commands for the current line.

Follow these steps:

1. Enter ? or the menu (M) command and press Enter. The help screen lists all available line commands. The sample shows how to specify line command help for the indicated line’s default object, table.
2. Enter ? in the selection line next to any of the listed items to get detailed help.

Display Information About the Report Options for an Object

You can display information about the report options for an object other than the current line’s default object.

Follow these steps:

1. Enter OBJECT COMMAND, where OBJECT is the object type and COMMAND is the help command (? or M) and press Enter. The object you specify can be referred to as the help object. The help screen will also list other line command.
2. Enter ? in the selection line next to any of the listed items to get detailed help.

Line Command Services Help Screen

This section describes the commands that appear on the Line Command Services help screen when the ? or M command is used alone in the CMD field from a Table List report (no help object is specified). (Help object is defined in the annotation for the previous screen.).

Enter S next to a command to select it for the object. The current report reappears with the selected command entered in the CMD line. You can select only one command from the Line Command Services help screen, because the selected command applies only to the CMD line where the help command was entered originally.

Note: If the command is from the Available Report Objects section (see Available Report Objects), a listing of report line commands for the object appears. You can select (S) from the listing, receive additional information (?), or exit from this screen by pressing PF3 or 15 (End).

Enter ? in the selection field to receive detailed help for any of the listed commands. You can enter as many question marks (?) as you like.

Note: The selection (S) and help (?) commands cannot be intermixed.
Available Report Objects

When a help object is not specified, the Available Report Objects section appears. This section shows the other report objects available from the current line. If you select a command from this section by entering S in the selection line, the full line command format (Object Option) will appear on the report.

General Line Commands

The General Line Commands section lists the line commands provided with CA RC/Query.

Note: For more information about command options, see the General Facilities Reference Guide.

Licensed Line Commands

The licensed line commands (global line commands) provide access to the functions of other installed CA products.

Note: For more information about these interproduct commands, see the General Facilities Reference Guide.

The client-name line commands are the commands used to access user-defined line command programming.

Line Command Services Help Screen Sections

The Line Command Services help screen is divided into sections as follows:

Report Options

Displays the line commands that are valid for the default object of the current line, or for the selected help object. (Help object is defined in the annotation for the previous screen.)

Report Objects

Displays the report objects available for the current line’s default object.

Note: If a help object has been specified, this section does not appear.
CA RC/Query Line Commands
Displays only the line commands that are specific to CA RC/Query.

Global Line Commands
The Interproduct Interface commands, which let you jump to other CA products.

Client-Name Line Commands
User-defined line command help is shown in this section.

How to Execute DB2 Utilities
You can execute the CA Technologies and the IBM DB2 utilities from within CA RC/Query using line commands. This execution saves time by providing direct access to the CA Technologies and IBM DB2 utilities.

You can also execute these utilities by specifying the UTIL command within CA RC/Query to be taken into the Utility Manager or by executing the utility itself.

You can enter a line command on any panel that contains objects the utility can process. For example, if you are using the COPY utility or the CA Quick Copy utility, the valid object types are tablespace (TS) and index (I).

Note: To access a CA Technologies utility through CA RC/Query, appropriate licensing must be in place and the utility must be installed.

Follow these steps:
1. Specify whether you want to use CA Technologies or IBM utilities:
   a. Type PROF on the command line and press Enter.
   b. Type 2 to select the CA RC/Query profile variables.
   c. Set the CA Technologies utilities field to Y (yes) for CA Technologies utilities or N (no) for IBM utilities.
      Note: If you enter Y, but do not have a license for the CA Technologies utility, CA RC/Query uses the equivalent IBM utility.
   d. Press F3 (End) to exit the profile.
2. Access a CA RC/Query report, enter a utility line command (like COPY, LOAD) next to an object, and press Enter.
   You can select multiple objects by entering the:
   - Same line command next to more than one object.
   - Line command next to the first object, and then entering an equal sign (=) next to any additional objects.
ALL command with a parameter like COPY or LOAD on any list report.

**Note:** For the utilities, there is one job step for each object. If more than 255 objects are selected, edit the JCL manually to break up the pieces.

Press Enter.

A panel displays for entering utility parameters. The parameters that are displayed change depending on which utility you are executing:

- CA Technologies utility users are taken to a utility parameter panel for the utility.
  
  **Note:** For more information about the fields and acceptable entries, see the utility product documentation.

- For an IBM utility, the default values are automatically assigned to the parameters. You can assign different values or press Enter to use the default values.
  
  **Note:** For a detailed description of the parameters and values for a particular IBM utility, see the IBM *Command and Utility Reference* guide.

When processing multiple objects, the parameter panel redisplays each time that you press Enter so that you can define parameters for each object.

3. Specify the utility parameters or accept the defaults, and press the END key.

The Submit Utilities panel appears.

4. Specify the job execution parameters and press Enter. These parameters include:

- The library that contains the model JCL.

- The execution mode (batch or online).

- Whether to submit the job to a data set or internal reader like JES.

- The output data set name.

The job is processed according to your specifications.

**More information:**

*Set Profile Variables* (see page 14)
List of Line Commands

There are several line commands that you can enter to select a utility. In some cases, the same line command is used to call the CA utility or the IBM utility:

- The CA utility is called if you have installed the utility and you entered a Y in the CA-UTILITIES field on the Profile screen.
- The IBM utility is called if you entered N in the CA-UTILITIES field on the Profile screen.

Note: Previously, the COPY line command was used to jump to CA RC/Update to copy a table. This line command has been changed to COPYD. The COPY line command now calls a utility, as listed in the following table.

A list of the line commands and the utilities they call are provided in the following table:

<table>
<thead>
<tr>
<th>Line Command</th>
<th>IBM Utility</th>
<th>CA Utility</th>
<th>Model Member Used</th>
<th>Object Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHECK</td>
<td>Check</td>
<td>CA Fast Check</td>
<td>MJUTLCD</td>
<td>TS, I</td>
</tr>
<tr>
<td>CLONE</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>T</td>
</tr>
<tr>
<td>COPY</td>
<td>Copy</td>
<td>CA Quick Copy</td>
<td>MJUTLIC</td>
<td>TS</td>
</tr>
<tr>
<td>LOAD</td>
<td>Load</td>
<td>CA Fast Load</td>
<td>MJUTLGL and MJUTLLD</td>
<td>TS</td>
</tr>
<tr>
<td>MERGE</td>
<td>MergeCopy</td>
<td>CA Merge/Modify</td>
<td>MJUTLMC</td>
<td>TS</td>
</tr>
<tr>
<td>MODIFY</td>
<td>Modify</td>
<td>CA Merge/Modify</td>
<td>MJUTLMD</td>
<td>TS</td>
</tr>
<tr>
<td>QUIESCE</td>
<td>Quiesce</td>
<td>Not Applicable</td>
<td>MJUTLQU</td>
<td>TS</td>
</tr>
<tr>
<td>RECOVER</td>
<td>Recover</td>
<td>CA Fast Recover</td>
<td>MJUTLRC#</td>
<td>TS, I</td>
</tr>
<tr>
<td>REORG</td>
<td>Reorg</td>
<td>CA Rapid Reorg</td>
<td>MJUTLRO</td>
<td>TS, I</td>
</tr>
<tr>
<td>REPAIR</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>MJUTLRPS</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>REPORT</td>
<td>Report Recovery or Report Tablespace (Screen displays selection of one or both utilities.)</td>
<td>Not Applicable</td>
<td>MJUTLRR</td>
<td>TS</td>
</tr>
<tr>
<td>RUNSTATS</td>
<td>RUNSTATS</td>
<td>PDASTATS</td>
<td>MJUTLRS</td>
<td>TS, I</td>
</tr>
<tr>
<td>STOSPACE</td>
<td>Stospace</td>
<td>Not Applicable</td>
<td>MJUTLGL</td>
<td>SG</td>
</tr>
<tr>
<td>UNLOAD</td>
<td>Unload</td>
<td>CA Fast Unload</td>
<td>MJUTLUNL</td>
<td>TS</td>
</tr>
</tbody>
</table>
**User-Defined Line Commands**

User-defined line commands are line commands that you create. There are several advantages when you create your own line commands:

- **Limited Access**—Create user-defined line commands through the model panels and ISPF. When you create the source code for the line commands through ISPF, you can program the source code to accept limited user IDs. Only those user IDs can execute the created line commands.

- **Convenience**—User-defined line commands execute like any other CA RC/Query line command. For example, you can enter multiple user-defined line commands from a report. You can access a report for your line commands and quickly return to the current report. (Because the created user-defined reports are an extension of an existing CA RC/Query report, the PATH command does not register the user-defined report.)

- **Control**—You have total control over the functionality of the line command program, the design of its created report, and the extent of its help panels.

**Note:** To change many objects at one time, use the ALL command with a parameter (like COPY, LOAD) on any list report. For utilities, there is one job step for each object. If more than 255 objects are selected, edit the JCL manually to break up the pieces.

The following model JCL members are used when you specify YES for USE THESE OPTIONS FOR ALL SELECTED OBJECTS:

- MJUTLGU (the UNLOAD driver)
- MJUTALLL (LOAD for multiple objects)
- MJUTALLU (UNLOAD for multiple objects)

To use site-specific naming conventions for data sets that the UNLOAD and LOAD utilities generate, configure these members as needed. The following standard naming conventions are used:

- For UNLOAD, %USERID..TABLE.UNLOAD.DATA.I%INCR.
- For LOAD, %DATASET.I%INCR.
User-defined line commands are instrumental when you want to achieve a certain focus for a report. For example, you can view information about an indexed column's DB2 catalog information. Or, you can view space usage information from IDCAMS. You can access the DB2 catalog and IDCAMS information by creating user-defined line commands. As illustrated in both of the examples, user-defined line commands are useful to look past DB2 objects.

**Note:** Creating user-defined line commands is an optional process. Sample user-defined line commands, LISTCAT and FLDSTAT, are provided to serve as functional models. LISTCAT displays space information that is taken from IDCAMS. FLDSTAT reads the SYSFIELDS table for the first column in an index key and displays DB2 catalog information for the index. These commands are enabled in the shipped product. The ULINENUL member in hlq.CDBASRC can be used to disable all user-defined line commands.

**LISTCAT**

The LISTCAT line command allows access to IDCAMS and displays the tablespace or indexspace space usage information as a report. LISTCAT can execute if:

- The actual space name appears on the report line. In this case, the command executes against the requested object.
- A table name and creator are displayed. In this case, the command executes on the table's tablespace.
- An index name and creator are displayed. In this case, the command executes on the index's indexspace.
LISTCAT is useful when you want to determine how much space you are currently using and how much space is available for extending the data set.

The following example illustrates the results of the LISTCAT line command.

```
![LISTCAT output]
```

Notice the following terms on the previous screen:

**LISTCAT LEVEL**

The VSAM information for this line was based on the database and tablespace of the selected object. This VSAM information was used by IDCAMS to generate the report displayed in the sample.

**IN-CAT...** (remainder of information on sample screen)

These fields display details about history, physical attributes, use, and allocation of the VSAM data set.

Press F10 or F11 to scroll left or right. Press F7 or F8 to scroll up or down. The last line of the report indicates if the report was successfully generated.

**Note:** For detailed information about the LISTCAT report’s fields, see the IBM Access Method Services Reference Guide.
FLDSTAT

Information about the first column in an index key is stored in SYSIBM.SYSFIELDS. FLDSTAT reads the SYSFIELDS table for the selected column and displays the information as a report.

This command is useful when you need to judge whether index values are evenly distributed among the index's partitions. If distribution is uneven, the FLDSTAT report can help you determine how partition index values should be reassigned.

FLDSTAT can be entered from a CA RC/Query report displaying both column and table fields, providing the column is the first column within an index that has had the catalog table updated.

RUNSTATS

If the selected column meets the mentioned criteria, the FLDSTAT report appears with the SYSFIELDS information. Otherwise, a blank report appears.

Column Detail Inquiry Report

The easiest method to determine which column is valid for the FLDSTAT command is to use the Column Detail Inquiry (C-D) report. From the Column Detail Inquiry report, enter FIND STATS. The columns containing the STATS field are eligible for the FLDSTAT command.

Note: For more information about the Column Detail Report and the STATS field, see the "Column Reports" chapter.

The following sample shows the results of the FLDSTAT line command for column ADMRDEPT:

| USFLDST | RUNSTATS Index Column Statistics
|---------|---------------------------------|
| COMMAND | SCROLL ====> CSR
| COLUMN  | TABLE   | CREATOR | FLDTYPE | LENGTH | SCALE | PERCENT | VALUE |
| ADMRDEPT | DEPT     | B062SNL | CHAR    | 3      | 0     | 50.00   | A00   |
|          |          |         | CHAR    | 3      | 0     | 30.00   | E01   |
|          |          |         | CHAR    | 3      | 0     | 20.00   | D01   |
|          | DSN8220  |         | CHAR    | 3      | 0     | 55.55   | A00   |
|          |          |         | CHAR    | 3      | 0     | 22.22   | D01   |
|          |          |         | CHAR    | 3      | 0     | 22.22   | E01   |

This report shows the column name, table name that contains the column, authorization ID of the user who created the table, data type and length of the column. In the case of a decimal column, length represents its precision or total number of digits in the number. It does not include the internal prefixes used to record the actual column lengths or null states.
This report also provides the scale information (number of digits to the right of the decimal point) of a decimal column, the percentage of times that the value of the column is contained in the VALUE field, and the column value whose frequency appears in the PERCENT field. For example, in both tables B0625NL.DEPT and DSN8220.DEPT, the most frequently occurring value is A00. This value occurs in at least half (50% and 55.55%) of all rows.

**EX**

The line command EX opens a popup window and lets you execute an 8-character REXX exec or clist name. The REXX exec or clist does not need to be registered in the USALINE source lib member. The normal z/OS search concatenation will be used to find the supplied name and then execute the routine. If the name does not exist or is spelled improperly, error messages are generated. Re-enter a proper name or exit the popup window using PF3.

This line command makes it simpler to access existing execs or clists that are not registered in source lib member USALINE. To eliminate the use of the popup window to execute REXX execs or Clists outside the product, register the name of the exec in source lib member USALINE. The example in Using USALINE depicts the definition of a sample REXX exec, TESTEX1, in USALINE. There is a new parameter, TYPE=R which indicates that TESTEX1 is a REXX exec or Clist. TESTEX1 executes from the line command position of many different reports.

**User-Defined Line Command Installation**

The sample user-defined line commands are installed as part of the regular installation procedure.

You can customize user-defined line commands after installation using the following members in *high-level.CDBASRC*:

**ULINEAL**

Use this member to enable user-defined line commands.

**ULINECMD**

Use this member to assemble user-defined line commands.

**ULINENUL**

Use this member to disable user-defined line commands.
Creating Your Own User-Defined Line Commands

If you want to create your own user-defined line commands, it is important that you understand the various members (programs and panels) referenced during user-defined line command creation and execution.

**USALINE**

Calls the application command programs. Application command programs are the programs containing the source code for the user-defined line commands. Before USALINE can call the line command's source program, you must define the command's title, name, and description that will appear on the Line Command Services help screen. These definitions are entered within USALINE.

**PTALINE**

CA global line command processor (Assembler source code). This program contains weak external references defined in USALINE.

**PTOLINE**

CA global line command processor (load module). This load module has been link edited without USALINE.

**PTLLINE**

Resulting load module from the linkage of PTOLINE with USALINE; uses information from USALINE (command title, name, description) to create the user-defined sections displayed on the Line Command Services help screen.

**PTLSCROL**

CA general scrolling routine. This program displays the user-defined line command's report.
Sample Programs

The following table presents some sample programs to create user-defined line commands.

**USALISTC**
Application command program invoked by LISTCAT, which contains the source code for the command.
- When LISTCAT is used, USALISTC retrieves database and tablespace information for the selected object. This information is formatted as the LISTCAT LEVEL (VSAM information) command.
- The LISTCAT LEVEL command is passed to IDCAMS, which generates the LISTCAT report. IDCAMS then sends the report to USALISTC. USALISTC prepares the report for CA's scrolling routine, PTLSCROL. USALISTC invokes PTLSCROL, which displays the LISTCAT report.

**USHLISTC**
Help panel for LISTCAT's report, USPLISTC.

**USPLISTC**
Product/report panel for LISTCAT, which displays the results of using the LISTCAT line command.

**USAFLDST**
Application command program invoked by FLDSTAT, which contains the source code for the command.
- When FLDSTAT is used, USAFLDST retrieves column and table information for the selected object. This information is formatted as object information.
- USAFLDST executes a static SQL statement on the object information that will retrieve the RUNSTATS information stored in SYSIBM.SYSFIELDS. USAFLDST generates the FLDSTAT report by preparing the statistics for scrolling (PTLSCROL). USAFLDST invokes PTLSCROL, which displays the FLDSTAT report.

**USHFLDST**
Help panel for FLDSTAT's report, USPFLDST.

**USPFLDST**
Product/report panel for FLDSTAT, which displays the results of using the FLDSTAT line command.
USAEX

Application command program invoked by EX, which contains the source code for the command.

When EX is used, a popup window appears prompting the user for an 8 character REXX exec or Clist name.

USAEX then attempts to execute the supplied exec or Clist name.

USHEX

Help panel for EX's popup window.

RQPREXX

Product panel for EX, which is the panel name for the popup window.

Naming Conventions

CA member names let you quickly recognize a member's product, type, and description. This section describes the naming conventions used by CA. These conventions should also be applied when you create members for your own user-defined line commands.

Maximum Length

A member name can be up to eight bytes.

Byte Categories

A member name is divided into several byte categories: product, type, and description.

These categories are illustrated in the following sample for file USAFLDST:

```
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Type</td>
<td>Description</td>
</tr>
</tbody>
</table>
```

The following describes the terms used in the previous example:

Product

Members are named according to their product category, as indicated by the first two bytes.

US

User-defined line commands (for example, USALINE). All user-defined line commands you create will begin with US.

PT

CA products (for example, PTLSCROL). Do not edit files beginning with PT when you create your own line commands.
User-Defined Line Commands

Type

The third byte represents the type of member.

O

Represents a load module prior to final link-edit. To include client modules, you must link edit these load modules. For example, PTOLINE is the load module for the global line command processor. PTOLINE must be link edited before user-defined line commands can be modified and executed.

A

Represents an application program. For example, USALINE is CA's user-defined line command program.

Note: When you create user-defined line commands, the source program for each created command must begin with USA.

L

Indicates a load module resulting from a link-edit. For example, PTLLINE is CA's load module that displays the user-defined commands on the Line Command Services help screen. PTLLINE is created when you link edit PTOLINE with USALINE.

P

Represents a product panel. When you create a user-defined line command, you must also create its corresponding product panel. The product panel will display the results of using the line command; the product panel is the report. For example, USPLISTC displays the results of using the LISTCAT line command. (When the product panel is shown within CA RC/Query, the third byte, P, is not shown.)

Note: When you create user-defined line commands, the product panel for each created command must begin with USP.

H

Indicates a help panel. When you create a user-defined line command, you must also create its corresponding help panel. A general rule is that the help panel uses the same member name as the product panel, except the P for product is substituted with an H for help. For example, the help panel for product panel USPLISTC is USHLISTC.

Note: When you create user-defined line commands, the help panel for each created command must begin with USH.

Description

The remaining five bytes describe the member. For example, PTLSCROL is the application program for CA's scrolling routine.
When you create a user-defined line command, the descriptive bytes are the first five bytes of the command name. For example, USAFLDST is the application program for line command FLDSTAT.

Note: For consistency and to avoid duplicate names, you will want the application program, product panel, and help panel for a user-defined line command to have the same description.

How to Define Line Commands

If you want to include user-defined line commands other than LISTCAT and FLDSTAT, you must assemble and link edit to help ensure that CA RC/Query can find your created line command files. The following section introduces the basic steps to creating user-defined line commands.

To create user-defined line commands:

1. Name the Command.
   
   Determine the command name, up to eight bytes. The first five bytes of the command name will become the descriptive bytes of the application command program (USAcmd_name), product panel (USPcmd_name), and help panel (USHcmd_name).
   
   For example, the command to list all valid objects is called REPORT1. Because the first five bytes are used to identify the command and are used as the basis for the application command program (USAREPOR), product panel (USPREPOR), and help panel (USHREPOR), these bytes should be unique. You could not create a command called REPORT2.

2. Create the Application Command Program.

   Create the application command program for your line command. This program should be created in the high-level.CDBASRC library. You can copy members USALISTC or USAFLDST as model programs and edit accordingly. The name should begin with USA and end with the first five bytes of the command name. In the example, REPORT1’s application command program is named USAREPOR.
3. **Edit USALINE.**

   Access USALINE from the *high-level.CDBASRC* library. Find the macro definition section (Macro Calls...Commands) and insert user-defined macro calls.

4. **Create Product and Help Panels.**

   Create the product and help panels for your line command. These panels should be created in the *high-level.CDBAPNL0* library. Copy product member USPLISTC (or USPFLDST) and help member USHLISTC (or USHFLDST) as model panels. Edit accordingly.

   The product panel name must begin with USP and end with the first five bytes of the command name. The help panel name must begin with USH and end with the first five bytes of the command name. In the example, REPORT1’s product panel is named USPREPOR, and its help panel is named USHREPOR.

5. **Assemble USAcmd_name.**

   Assemble the application command program. In the example, USAREPOR needs to be assembled. When the program is assembled, an object module is created for it. This object module is used by PTOLINE.

   JCL member ULINECMD can be used for an example when assembling.

6. **Link.**

   Link PTOLINE and USALINE. USALINE automatically brings in any references for USA named files. For example, the application command programs for USAcmd_name (USAREPOR), USAFLDST, and USALISTC are automatically brought in. The result of the linkage is called PTLLINE.

   When linking, use member ULINEAL from *high-level.CDBASRC*.

7. **Rebind.**

   Rebind the CA RC/Query plan. The name of this plan varies according to the product release. For example, the plan name of release 3.0 is RQPAO300.

   **Note:** For more information about the REBIND command, see the IBM *DB2 Administration Guide*.

8. **Confirm.**


   b. Enter a help command (? or M) in an appropriate report’s CMD line. The Line Command Services help screen appears.

   c. Confirm that your created line command is listed on this screen.

   d. Select your line command by entering S in its CMD line.

   e. Press Enter. The current report should reappear with your line command entered in the appropriate CMD line.

   f. Press Enter to test execution.
Parameters Passed to the Called Routine

The following parameters are passed to the called routine.

**Note:** For an example of their use, see TESTEX1 in high-level.CDBASRC.

**LCMD@**
Address of line command.

**OBJTBL@**
Address of CA internal object table control block.

**PTMBDB@**
Address of CA internal BDB control block.

**PTILIB@**
Address of open load library.

**SELOBJ@**
Address of selected object.

Using USALINE

USALINE automatically calls application command programs, product panels, and help panels referenced by user-defined line commands. You need to access and edit USALINE only when you want to create your own user-defined line commands.
USALINE is found in the high-level.CDBASRC library. When you access USALINE, search for the section Macro Calls to Describe Available Command by using the FIND command. This section must be edited to include macro calls. Macro calls identify the command names, titles, and descriptions that appear on the Line Command Services help screen. There are two macro call lines that you must define when you create user-defined line commands: USMLINE1 and USMLINE2.

```
EDIT .... GENERAL.WRK0202.ASM(USALINE) - XX.XX -------------- COLUMNS 001 072
COMMAND ===> SCROLL ===> CSR
025800     TITLE 'MACRO CALLS TO DESCRIBE AVAILABLE COMMANDS'
025900
**********************************************************************
026000 *    PTALINE PROVIDES A SCROLLABLE LIST OF AVAILABLE LINE    *
026100 *    COMMANDS.
026200 *                                                            *
026300 *    USMLINE1 CREATES A SECTION TITLE FOR THE                  *
026400 *    USER-DEFINED PORTION OF THIS LIST AND SHOULD BE          *
026500 *    FOLLOWED BY ONE OR MORE USMLINE2 MACROS.                *
026600 *                                                            *
026700 *    USMLINE2 CREATES A LINE IN THIS LIST FOR EACH            *
026800 *    USER-DEFINED COMMAND.                                  *
026900 **********************************************************************
027000     USMLINE1 'CLIENT-NAME LINE COMMANDS'
027100     USMLINE2 LISTCAT,(DB,TS),                                *
027200     'IDCAMS Listcat of table space'
027300     USMLINE2 FLDSTAT,(C,T),                                 *
027400     'Most frequent index column values'
027500 **********************************************************************
027600     USMLINE3 FOLLOWS THE FINAL USMLINE2 MACRO TO              *
027700     COMPLETE GENERATION OF THIS LIST AND CREATE THE TABLE OF *
027800     COMMANDS AND OBJECTS THAT PTALINE WILL USE TO VALIDATE   *
027900     LINE COMMANDS.                                          *
028000 **********************************************************************
028100     USMLINE3
```

Notice the following fields on the preceding screen:

**Text in boxes**

Indicates the edits you need to make are documented within comment boxes.

**USMLINE1**

Indicates the command title, represented as command_title. Enter the appropriate information in the format: USMLINE1 'command_title' In the example, CLIENT-NAME LINE COMMANDS is used to describe LISTCAT and FLDSTAT.
USMLINE2

Indicates the command name, the objects that must appear on the report before the command can be used, and the command description. Enter the appropriate information in the format: USMLINE2 command, (object,object,...), 'command_description'. In the example, LISTCAT can be executed only from a report displaying both a database (DB) and tablespace (TS). FLDSTAT can be executed only from a report displaying both columns (C) and tables (T).

USMLINE3

This line must appear only once within USALINE; it is already included as the default, so do not edit it. USMLINE3 indicates to USALINE the end of the macro calls.

After the appropriate assembling and linking, PTLLINE will display the macro calls on the Line Command Services help screen.

<table>
<thead>
<tr>
<th>Command</th>
<th>Command Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LISTCAT</td>
<td>IDCAMS Listcat of table space</td>
</tr>
<tr>
<td>FLDSTAT</td>
<td>Most frequent index column values</td>
</tr>
</tbody>
</table>

Additional macro calls are created in blocks, which let you quickly copy and edit with ISPF line commands. A block consists of one USMLINE1 line and its associated USMLINE2 lines.

```
USMLINE1 'CLIENT-NAME LINE COMMANDS'
USMLINE2 LISTCAT, (DB,TS),
  'IDCAMS Listcat of table space'
USMLINE2 FLDSTAT, (C,T),
  'Most frequent index column values'
USMLINE1 'SAMPLE EXTRA SECTION OF LINE COMMANDS'
USMLINE2 REPORT1, (T,V,C,S,U,P,DR,I,VC,SG,DB,TS,BP,SY,RI),
  'List of all valid object codes'
USMLINE3
```
User-Defined Line Commands

After the appropriate assembling and linking, PTLLINE will display the multiple macro calls on the Line Command Services help screen as:

```
PTLINE ---------------- Line Command Services -------------------
COMMAND ===> SCROLL ===> PAGE
S COMMAND COMMAND DESCRIPTION
CLIENT-NAME LINE COMMANDS
   LISTCAT - IDCAMS Listcat of table space
   FLDSTAT - Most frequent index column values
   SAMPLE EXTRA SECTION OF LINE COMMANDS
   REPORT1 - List of all valid object codes
```

You can create as many commands as you need. The default number of commands (USMLINE2) is 20.

To change this macro definition default, search for &CMD (20), &OBJ(20). There are three occurrences of this string. Change the 20 values to the new numeric values. Save your changes.

Help Panels

When you create user-defined line commands, you must also create a help panel (USHcmd_name). Otherwise, an ISPF error will occur if someone tries to access a nonexistent help panel.

Note: You must use CA naming conventions to allow successful help panel connection.

Help panels can be as detailed as you want. USHLISTC and USHFLDST are provided as model help panels.

A help screen can be invoked from either of the following sources:
- Line Command Services help screen
- User-defined line command’s product panel

Access Help from Line Command Services

To access the help panel from Line Command Services, enter a question mark (?) on the selection line next to a user-defined line command.

The help panel appears.
Product Panel Help

When the user-defined line command's product panel (USPcmd_name) appears within CA RC/Query, you can press PF1 to receive additional help about that report. PF1 references the product panel's PROC section to find the associated help panel.

A help panel is associated with a product panel by the line, .HELP=USHcmd_name. For example, USPLISTC associates its help panel as .HELP=USHLISTC. See product panels USPLISTC and USPFLDST as models.

Proprietary Services

When you edit USALINE, you must be careful not to edit CA's two proprietary services: PTMBDB and PTLSCROL. PTMBDB is a macro routine that performs a reconnect. This macro enables any USA program to properly access DB2. PTLSCROL is a scroll routine that provides a scrollable list.

Note: These proprietary services must be included in any USA named program. USALISTC and USAFLDST include PTMBDB and PTLSCROL as model code.

User-Defined Line Commands Usage

To achieve a certain focus for any report, create user-defined line commands that invoke user application programs.

Two sample user-defined line commands are provided as useful models:

**FLDSTATS**

Provides DB2 catalog information for an indexed column.

**LISTCAT**

Displays space usage information from IDCAMS.

User-defined line commands give you total control over the function and design of reports. If necessary, you can limit access to a user-defined line command by programming the command's source code to accept only certain user IDs.
Generate Hierarchical Object DDL

The HDDL (hierarchical DDL) command lets you generate DDL online and in batch (in the proper execution order) for a primary object and parent and dependent objects in its hierarchy. This command lets you use DDL to manipulate the objects as needed. For example, you can generate and execute DDL that creates the set of objects on a separate subsystem. You can also specify whether to generate SPUFI compatible HDDL output. This option lets DBAs save scripts and run them in online mode. Running scripts in batch mode can be time-consuming if the batch queues are busy.

Batch processing is useful when you are working with a large number of objects (like on a database such as PTDB). Other activities can continue while the command executes in batch.

Note: This command generates implode and explode DDL. HDDL does not support auxiliary implode or the ability to include foreign key definitions and tables that are contained within the referential integrity structure. For complete information about auxiliary implode and referential integrity, see the CA RC/Migrator User Guide.

Follow these steps:

1. Complete the fields on the CA RC/Query main menu to define the object and options for a report, and then press Enter.

   The appropriate report appears.

2. (Optional) Scroll through the report by pressing F7 (to scroll up) or F8 (to scroll down).

   Details appear as you scroll.

3. Enter HDDL in the CMD field for an object.

   Note: Multiple HDDL line commands on separate lines are processed separately. For more information about this line command (and other available line commands in CA RC/Query), see the online help.

   A pop-up dialog appears where you can specify additional options (execution mode, the SQL terminator option, and whether to generate SPUFI compatible output).

4. Specify the execution mode and press Enter.

   For batch execution, the parameter file and model JCL are built and the Batch JCL Specification panel appears where you can enter information and can submit the batch job. HDDLOUT DD has the output of the HDDL commands, which can be used as input for the Batch Processor to execute the generated DDL. ERRORMSG DD has any informational, warning, or error messages that are generated.

   For online execution, the Batch Processor Display Input panel appears showing the generated DDL, which can be edited or executed.
How to Apply Changes to Many Objects

The ALL command copies any line command to all lines of a generated report automatically. You can exclude (=X) lines as needed. When you press Enter, the included (=) commands are executed at one time. This behavior is the same as manually typing equal (=) for all items in the report list. The ALL command is useful when you have a command that you want to apply to many objects simultaneously. For example, from a tablespace list you can execute the COPY command for all listed objects without retyping COPY on each object line.

**Note:** For the utilities (such as COPY, LOAD), there is one job step for each object. However, an option is provided to apply the changes to a single object or to all objects. If more than 255 objects are selected, a new JOB statement is inserted in the JCL automatically after every 255 steps.

To view a list of valid commands that can be used with the ALL command, enter a question mark (?) on the command line. To cancel and clear any specified commands, use the CANCEL or RESET commands.
Chapter 5: DB2 Object Reports

This section contains the following topics:

- Table Reports (see page 66)
- View Reports (see page 69)
- Index Reports (see page 70)
- Column Reports (see page 72)
- Synonym Reports (see page 74)
- Alias Reports (see page 75)
- Referential Integrity Reports (see page 76)
- Coldist Report (see page 81)
- Sequence Reports (see page 81)
- Role Reports (see page 82)
- Storage Group Reports (see page 84)
- Database Reports (see page 86)
- Tablespace Reports (see page 89)
- Buffer Pool Reports (see page 91)
- History Table Reports (see page 92)
- User Reports (see page 96)
- System Reports (see page 98)
- VSAM Catalog Reports (see page 102)
- Trusted Context Reports (see page 104)
- Plan Reports (see page 104)
- Collection Reports (see page 107)
- Package Reports (see page 108)
- DBRM Reports (see page 110)
- LOB Reports (see page 111)
- Routine Reports (see page 111)
- Schema Reports (see page 112)
- Trigger Reports (see page 113)
- Trusted Context Reports (see page 114)
- Distinct Type Reports (see page 115)
Table Reports

A table is a collection of rows, all having the same columns. All data in DB2, including the system catalog information, is stored in tables.

The table reports display the information that is available in the DB2 system catalog concerning DB2 tables and their related objects. You can use the function scrolling keys to scroll through the reports.

Some of the report columns display information that is produced when you update the DB2 catalog. If you have not updated information for a table's tablespace, N/A appears in the dependent report columns.

The following report options are available for the table (T) object type:

**Note:** To jump to another report, use the Qualifier field on the table panels. The Grantor field is inactive, except for selecting the grantor of the permission for the table authorization reports: Table User Authorization, Table Plan Authorization, and Table Package Authorization. The Creator field is used to select the creator of the table.

**D (Table Detail)**

Displays a full page of detail information for tables including:

- The number of rows
- The total number of pages
- The percent of used pages
- The maximum record length
- Summary statistics

To improve performance when this report is generated, set the Full Detail profile option to N. This setting omits object counts from the report. To interrupt processing on a long-running detail report, use the ATTN key.

**L (Table List)**

Displays a row of basic information about each table that matches your selection criteria. Multiple tables are shown on each page. This report is a good starting point for your table inquiries. Use it to find the tables about which you want further information. You can then use line commands to select other reports, such as the Table Detail report.

**P (Table Plan)**

Displays a row of information for each plan that is dependent on a table, matching your search and selection criteria. You can page the report to view all the dependent plans.

**S (Table Synonym)**

Displays all the synonyms that are defined for the selected tables.
I (Table Index)
Displays detail information for each index that is defined for specified tables. This information includes whether the index is clustered, the number of columns in the key, and whether the index is unique.

C (Table Column)
Displays detail column information for each table that is selected including the column type, length, whether it can be updated, column number, and key information.

Note: The Column Table report provides the same information, but from the perspective of the column, rather than the table.

V (Table View)
Displays a row of information for each selected table that has view dependencies (the view references the table in its SELECT statement). The report is sorted by table/view name; all views that reference a particular table are displayed together.

O (Table Object Dependency)
Displays all objects dependent upon a table in a hierarchical report format. Creator IDs for certain objects are displayed when the Qualify feature is turned on. The View Level option controls the number of view levels that are displayed.

UA (Table User Authorization)
Displays all the authorized users for each table selected. This report can be used to determine the effect on the user community of dropping a table and to verify the table security.

The UPDC column that is displayed on this report denotes whether the user holds specific column update privileges. If you want to view specific columns for which the user holds the update privilege, use the User Table Authorization report.

PA (Table Plan Authorization)
Displays all dependent plans for each table selected. The report also displays the authorities that those plans have over the tables, and therefore can help determine the possible impact of DB2 plans on production tables.

KA (Table Package Authorization)
Displays the authorities for packages that are dependent on the selected tables. You can view reports that are based on the table creator (by customizing the Creator field in the header). Alternatively, you can view reports that are based on the grantor of package privileges (by customizing the Grantor field).

PK (Table Package)
Displays the packages dependent on the selected tables and provides basic information about these packages.
UC (Table Unique Constraint)

Provides information about both primary key and unique key unique constraints. The qualifiers for this report are Table Name, Table Creator, and Constraint Name.

The Table Unique Column report displays detail column information for tables that were created with a UNIQUE clause, or that have columns that are defined as NOT NULL UNIQUE. These tables are recorded in the DB2 catalog as incomplete until all required unique indexes have been created. After all required indexes have been created for a table appearing on this report and the table is complete, it will no longer appear on the report.

DI (Drop Impact)

Lets you evaluate the impact of a drop on the selected tables and dependent or otherwise related objects.

A (Table Alias)

Displays a row of information for each selected table that has alias dependencies (the alias references the table in its SELECT statement). The report is sorted by table/alias name so that all aliases for a table are displayed together.

The Creator field in the header selects the creator of the referenced table, not the alias itself.

LR (Table LOB Relationship Report)

Displays the LOB relationship information for DB2 data sets associated with the selected table.

For this report, the qualifiers are the Table and Creator fields.

TG (Trigger)

Displays a row of trigger information for each selected table. This data can be useful when you need detailed information about a specific trigger and its associated tables.

The triggers are sorted in firing execution order. The primary sort is performed on the value (before or after) in the TRIGTIME column. The secondary sort is performed on the CREATEDTS timestamp.

For this report, the qualifiers are the Table and Creator fields.

MQ (Materialized Query Tables)

Displays a row of basic information for each Materialized Query Table (MQT) that matches your selection criteria. Multiple MQTs are shown on each page.

HL (Table History List)

Displays data from the following DB2 history tables in the DB2 catalog:

- TABL (SYSIBM.SYSTABLES_HIST)
- TABP (SYSIBM.SYSTABLEPART_HIST)
- TABS (SYSIBM.SYSTABSTATS_HIST)
View Reports

A view is a DB2 object that provides an alternate way of viewing a table or another view. A view can include all or some of the columns that are contained in the table or tables on which it is defined. A view can represent one or multiple tables and views. A view can be used like a table, but a view does not occupy any space because it is merely an alternate representation of the actual data.

The view reports display the information that is available in the DB2 system catalog concerning DB2 views and their related objects. You can use the function scrolling keys to scroll through the reports.

The following report options are available for the view (V) object type:

Note: To jump to another report, use the Qualifier and Grantor fields on the view panels. The exception is the View User Authorization report, where the Grantor field selects the grantor of the privilege. The Creator field is used to select the creator of the view.

D (View Detail Report)
Displays a page of detailed information for one or more views. This information includes:
- Creator information
- Whether the CHECK OPTION was specified during the view creation
- The actual text of the view

L (View List Report)
Displays a row of basic information about each view that matches your selection criteria. Multiple views are shown on each page. This report is a good starting point for your view inquiries. Use it to find the views about which you want further information. You can then use line commands to select other reports, such as the View Detail report.

T (View Table Report)
Displays all views and tables that are dependent on the selected views, and includes the view and table creator information.
P (View Plan Report)
Displays a row of information for each plan that is dependent on the selected views. This report is sorted by view/plan name; all plans dependent on a view are displayed together.

S (View Synonym Report)
Displays all the synonyms that are defined for a view.

**Note:** The Creator field in the header selects the creator of the view, not the synonym.

C (View Column Report)
Displays detailed column information for each view selected. Some of the columns on this report display information that is produced when you update the DB2 catalog. If you have not updated information for a view’s tablespace, N/A appears in the dependent report columns.

O (View Object Dependency)
Displays all objects that are dependent upon the selected views. Creator IDs for certain objects are displayed when the Qualify feature is turned on. The View Level option controls the number of view levels that are displayed.

UA (View User Authorization)
Displays all the authorized users for each view selected. This report can be used to determine the effect on the user community of dropping a view and to verify the view security.

PK (View Package Report)
Displays the packages that are dependent on the selected views and provides basic information about these packages.

DI (View Drop Impact)
Lets you evaluate the impact of a drop on the selected views and dependent or otherwise related objects.

**Index Reports**

An index is a DB2 object that contains an ordered set of pointers into a table. The index is based on one or many columns in a table and can be created at any time after the target table has been created. (It is more efficient to load the table after the indexes have been defined.) An index is used to improve performance and guarantee uniqueness of the columns.

Every index occupies its own indexspace, which consists of from one to several ESDS VSAM data sets. The indexspace is always stored in the same database as the target table.
When the index (indexspace) is created, you designate its storage group (or VSAM catalog for explicit VSAM definitions) and buffer pool. If you do not specify a buffer pool or storage group, the index uses the storage group and buffer pool designated for the database. An index can be partitioned or simple.

The Index reports provide the information necessary to monitor index definitions and plan dependencies.

The following report options are available for the index (I) object type:

Note: To jump to another report, use the Qualifier and Grantor fields on the index panels. The Creator field is used to select the creator of the index. Some of the report columns display information that is produced when you update the DB2 catalog. If you have not updated information for an index's indexspace, N/A appears in the dependent report columns.

D (Index Detail Report)
- Displays a full page of detail information for indexes including:
  - The creator, database, indexspace, storage group and buffer pool
  - The unique, erase, and close rules
  - An index's definition
  - Current space use
  - Partition information
  - Whether an index is sparse

To display the actual table column names that are used by the index, use the Index Column Report.

If an index is not partitioned (simple), the partition number is displayed as zero.

L (Index List Report)
- Displays a row of basic information about each index that matches your selection criteria. Multiple indexes are shown on each page. This report is a good starting point for your index inquiries. Use it to find the indexes about which you want further information. You can then use line commands to select other reports, such as the Index Detail report.

C (Index Column Report)
- For each index selected, the Index Column report displays the table the index is based on and the table columns referenced by the index. Multiple indexes are shown on each page.

PL (Index Partition List Report)
- Displays partition information for DB2 data sets associated with the selected index.
P (Index Plan Report)
Displays the plans that are dependent on the selected index or indexes.

PK (Index Package Report)
Lists the packages that are dependent on the specified indexes and provides basic information about these packages.

DI (Index Drop Impact Report)
Lets you evaluate the impact of a drop on the selected index or indexes and on dependent or otherwise related objects.

LC (Index LISTCAT Report)
Displays detail and summary space information for DB2 data sets associated with the selected index, letting you quickly identify exceptional conditions.

HL (Table History List)
Displays data from the following DB2 history tables in the DB2 catalog:
- TABL (SYSIBM.SYSTABLES_HIST)
- TABP (SYSIBM.SYSTABLEPART_HIST)
- TABS (SYSIBM.SYSTABSTATS_HIST)

HD (Table History Detail)
Displays detail information from the relevant history table.

HP (Table History Partition)
Displays partition table data from the relevant history table.

HS (Table History Statistics Detail)
Displays the statistical table data from the relevant history table.

**Column Reports**

The Column reports display cross-reference information for all table columns defined in the DB2 system. The Column reports let you view how a column is defined across multiple tables and indexes. They are very beneficial for implementing standard field definitions and enforcing those standards within the DB2 system.

**Note:** The Grantor field is typically used for jumping to other reports. The exceptions are the authorization reports: Column User Authorization, Column Plan Authorization, and Column Package Authorization. For these reports, the Grantor field selects the grantor of the update privileges on the column. The Creator field is used to select the creator of the table or view and the Qualifier field selects the name of the table or view. The exception is the Column Index Report, where the Creator field selects the creator of the index and the Qualifier field selects the name of the index.
The following report options are available for the column (C) object type:

**D (Column Detail Report)**
Displays detailed information for a column including:
- Columns used in an index
- Columns used in referential integrity (foreign and primary keys)
- DB2 catalog distribution values, if available
- Table or view name the column is in
- Total number of columns within the table/view
- Column type, length, null value, and second lowest/highest column values

This report is useful in determining valid columns for the FLDSTAT user-defined line command.

To improve performance when this report is generated, set the Full Detail profile option to N. This setting omits the RULE, INDEX, STATS, and FLDPROC sections from the report.

**T (Column Table/View Report)**
Displays all tables/views that reference a particular column name. Information provided includes table or view name and creator and column information, such as type, length, and whether the column is nullable or has a default value. The column definition defined within each table is also displayed to highlight possible discrepancies. A single column or multiple columns can be selected.

**I (Column Index Report)**
Displays all indexes that reference a particular column name. Information provided includes index name and creator, column number, sequence, order, and unique rule information. The column's role in the index (position and order) is also displayed, which allows you to easily view the different uses of a particular column. A single column or multiple columns can be selected.

*Note:* The Creator prompt selects the creator of the index.

**UA (Column User Authorization Report)**
Displays all the authorized users for each column selected. This report can be used to determine the effect on the user community of dropping a column and to verify the column security.
PA (Column Plan Authorization Report)

Displays authorizations for plans that hold update privileges for the specified columns. This report is similar to the Column Package Authorization report, except that it is based on the update privileges held by plans.

KA (Column Package Authorization Report)

Displays authorizations for packages that hold update privileges for specified columns. This report is similar to the Column Plan Authorization report, except that it is based on the update privileges held by packages.

HD (Column History Detail)

Displays columns from the SYSCOLUMNS_HIST DB2 catalog table. No commands are available.

HL (Column History List)

Displays data from the following history tables in the DB2 catalog:
- CDIS (SYSIBM.SYSCOLDIST_HIST)
- COLM (SYSIBM.SYSCOLUMNS_HIST)
An HD command on any line shows the details from the base history table.

Synonym Reports

Synonyms are often created by users who want to refer to tables by names that are easier to remember than their fully qualified names. These alternate names can also be used in applications to reference tables without tying the source code to the physical object.

The Synonym reports display a list all of defined synonyms within the DB2 system and their corresponding table and view names. A synonym provides an alternate name for a table or view. These reports let you refer to the DB2 object represented by the synonym without having to use a fully qualified name. Use these reports to retrieve the table or view name that is represented by a synonym. For example, you might have been granted authority to access a table or view through a synonym, but you do not know the name of the underlying table or view. You can use these reports to determine the table or view name and then use a line command to display a detail report on that table or view.

For Synonym reports, the Creator field in the header selects the creator of the synonym. The Qualifier and Grantor fields are used only for jumping to other reports.
The following report options are available for the synonym (S) object type:

**L (Synonym List Report)**
Displays basic information about synonyms and is sorted by plan name. This report is a good starting point for viewing all the synonyms that are defined in the DB2 subsystem. This report displays basic information for synonyms and is sorted by plan name.

**T (Synonym Table Report)**
Lists the selected synonyms and their corresponding tables.

**V (Synonym View Report)**
Lists the selected synonyms and their corresponding views.

**P (Synonym Plan Report)**
Lists the selected synonyms and their corresponding plans.

*Note:* The Creator prompt selects the creator of the synonym, not the view.

**PK (Synonym Package Report)**
Lists the packages dependent on the selected synonyms, and provides basic information about these packages.

**DI (Synonym Drop Impact Report)**
Lets you evaluate the impact of a drop on selected synonyms and on dependent or otherwise related objects.

### Alias Reports

An alias is an alternate name for a table or view. It is similar to a synonym, except that no special authority is required for its use. An alias is available to all users; it is like a public synonym.

For Alias reports, the Creator field selects the creator of the alias. The Qualifier and Grantor fields are used only for jumping to other reports.
The following report options are available for the alias (A) object type:

**L (Alias List)**

Displays a row of basic information for each alias that matches your selection criteria. Multiple aliases are shown on each page.

**P (Alias Plan)**

Displays a row of information for each plan that is dependent on the selected aliases.

If you use selection criteria to specify multiple aliases, you can page vertically through the report to view all the aliases you specified and their dependent plans, and horizontally to see all the information for each alias selected.

**PK (Alias Package)**

Provides basic information about the packages that are dependent on the selected aliases.

**DI (Alias Drop Impact)**

Provides the impact of a drop on the selected aliases and dependent or otherwise related objects.

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**Referential Integrity Reports**

Before making changes to tables, you must know their parent/child relationships so you can assess the effect of additions or deletions. The Referential Integrity reports display the information necessary for monitoring and maintaining referential integrity. Referential integrity enables you to define the relationship between a primary key (a selected unique key) in one table and a key in another table, called the foreign key.

To define the relationship between two tables using primary and foreign keys, you must make referential rules. Referential rules help ensure referential integrity. After you have defined the relationship between the keys, DB2 will help ensure that changes to data are consistent between parent and child tables. (The table whose primary key you are using for reference is called the parent table. The table that calls upon this reference through a foreign key is called the child table.)

For most Referential Integrity reports, the Qualifier and Grantor fields are used only for jumping to other reports and the Creator field selects the creator of the parent table. The exceptions are:

- The Check Pending/Tablespaces report. The Qualifier field selects the name of the database, and the Grantor field selects the grantor of the privilege.
- The Spaceset report. The Qualifier field selects the name of the database.
The following report options are available for the referential integrity (RI) object type:

**L (Referential Integrity List by Rule Name)**
- Displays a list of referential integrity information selected that is sorted by rule name.
- The Creator field selects the creator of the child or parent table based on the value specified in the DB2 Object field.

**P (Parent Relationships Report)**
- Displays parent information for tables that match your selection criteria. This report shows referential integrity from a parent table's perspective. For each parent table, all child tables are listed along with the rule name, creator information, and delete rules.

**C (Child Relationships Report)**
- Displays child information about all tables that match your selection criteria. This report shows referential integrity from a child table's perspective. For each child table, the parent table is listed, along with the rule name, creator, and delete rules.

**A (All R/I All Relationships)**
- Displays the parent/child relationships for a specified table, as well as the parent/child relationships of related tables. To view information about multiple tables, specify a mask in the Table Name field.

**PK (RI Primary Key Columns Report)**
- Displays column information for columns defined as part of a primary key. This information is sorted by parent table name for the PK and includes column length, type, key sequence, and so on.

**FK (RI Foreign Key Columns Report)**
- Displays column information for columns defined as part of a foreign key. This information is sorted by child table name and includes child and parent table names and creators, column length and type, and much more.

**AK (All R/I Key Columns)**
- Displays information for any column that is defined as part of a primary or foreign key. The information is sorted by the parent table name and includes column length, type, key sequence, and much more. You can also match primary key columns to foreign key column definitions.

**T (RI Check Pending/Tables Report) and TS (RI Check Pending Tablespaces Report)**
- Displays check pending information for the tables or tablespaces specified.
- If the tablespace that contains a foreign key has ever contained data, creating foreign keys puts the tablespace in a CHECK PENDING mode. This means that the tablespace is locked until the CHECK utility is run.
Only tables or tablespaces in a check pending status are displayed. This report is provided so that you can get a list of all tables or tablespaces in a check pending status. Although the CHECK utility is still run at the tablespace level, you can view information on a table level. Information is sorted by table name.

The Creator prompt selects the creator of the table or tablespace. For tables, the Qualifier and Grantor fields are used only for jumping to other reports. For tablespaces, the Qualifier field selects the name of the database, and the Grantor field selects the grantor of the privilege.

**SS (RI Spaceset Report)**

Displays information about tablespaces (spacesets) that are connected by dependent tables. This report displays all the implicit relationships of spacesets. For example, if you recover a tablespace, you also need to recover any related tablespaces that are linked through Referential Integrity (RI) rules. The RI Spaceset report shows you these linked relationships.

The Creator field in the header selects the creator of the parent table. The Qualifier field selects the name of the database, allowing you to select the databases associated with the specified tablespaces. The Grantor field is used only for jumping to other reports.

Indented tablespace names are related to the tablespace names that are not indented through the referential integrity relations of their contained tables.
Parent and Child Relationship Samples

Parent and Child Relationships reports are illustrated in the following samples:

### Parent and Child Relationships Report

```
<table>
<thead>
<tr>
<th>DBOBJ</th>
<th>OBJ</th>
<th>OPNAME</th>
<th>CBOBJ</th>
<th>RULENAME</th>
<th>TBNAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>DEPT</td>
<td>P</td>
<td>DEPT</td>
<td>DEPTNO</td>
<td>PROJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RDD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EMP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EMPX</td>
</tr>
</tbody>
</table>
```

Notice the following report features in the previous samples:

#### Self-Referencing Tables

Parent and child tables are not necessarily distinct. Notice that in the Parent Relationships report, the parent table DEPT lists itself as a child table. Self-references such as this are clearly presented in the Parent Relationship report.

You can see the same relationship from the child table’s perspective in the Child Relationships report. DEPT is listed as a child and as its own parent table.

#### Cyclical Definitions

Referential Integrity can create what is known as a cyclical definition. A cycle is a set of two or more tables that can be ordered so that each is a dependent of the one before it, and the first is a dependent of the last.
In the Parent Relationships report, the table DEPT lists EMP as one of its child tables; the table EMP lists DEPT as one of its child tables. (You can see the same relationship from the child table’s perspective in the Child Relationships report.) Cyclical definitions are important to understand when you are assessing the effects of deleting data.

In a cycle of two tables, neither delete rule can be CASCADE. In a cycle of more than two tables, no table can be connected with itself via a delete path. So, for example, in a cycle with three tables, two of the delete rules must be other than CASCADE. Considerations such as these are presented visually through the Parent Relationships report. Because not only the cyclical definition, but also the delete rule for each relationship is shown, you can more assess the effects of a deletion on a table and its dependents.

**Note:** For more information about Referential Integrity, see the IBM DB2 Administration Guide

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**Check Pending**

If a table is loaded without enforcing referential constraints on its foreign keys, it can contain data that violates the constraints. Using that data could threaten the referential integrity of an entire set of related tables. So the tablespace containing the table is immediately placed in a special status called *check pending*. Until the status is reset, none of the tables in the tablespace can be used for SQL SELECT, INSERT, UPDATE, or DELETE operations.

Other operations that can cause a tablespace to be placed in check pending status are:

- Defining a referential constraint on a populated table, using ALTER TABLE
- Interrupting a LOAD job before the checking of referential constraints is complete
- Executing the LOAD utility with the ENFORCE=NO option
- Replacing the data in a parent tablespace, using LOAD REPLACE. The tablespaces containing all the dependent tables of the parent are placed in check pending status

The CHECK DATA option of the CHECK utility verifies whether the tables of a tablespace violate referential integrity and, optionally, deletes any invalid rows. If no rows violate the referential rules, or if invalid rows are deleted, the utility resets the check pending status of the tablespace. In addition to the CHECK DATA option of the CHECK utility, the following operations can reset the check pending status of a table:

- Dropping the tables that contain the invalid rows
- Replacing the data in the tablespace, using LOAD REPLACE and enforcing the referential constraints
- Dropping all foreign keys in the table, using ALTER TABLE. The check pending status is reset when there are no more foreign keys defined in the table
There are a few more ways you can reset the check pending status in other ways, but most of them will risk losing referential integrity.

**Note:** For more information, see the IBM System and Database Administration Guide.

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**Coldist Report**

The HD report option is available for the coldist (CD) object type. This report option shows columns from the DB2 catalog table: SYSIBM.SYSCOLDIST_HIST.

The Creator field selects the creator of the table or view and the Qualifier field selects the table or view. The Grantor field is used for jumping to other reports.

**Sequence Reports**

A *sequence* is a user defined stored object that generates a sequence of numeric values in ascending or descending order. A sequence provides recoverable, unique sequential numbers for applications and is especially useful in providing keys. In contrast to identity columns, sequences are stand-alone objects that applications can use to avoid concurrency and performance problems that can result when applications generate their own sequence numbers. After a sequence is defined, you can access and increment it concurrently with other users, including multiple DB2 members in a data sharing group.

To access the Sequence Main Menu, from the RC/Q Main Menu, enter SQ as the DB2 Object and press Enter. To control the output of your reports, enter selection criteria or make specific entries in the fields. Use selection criteria to focus your report.

You can generate the following sequence reports:

**L (Sequence List Report)**

Provides a list of all defined sequences. It provides basic information about user-defined sequences that match your selection criteria. Use this report as a starting point for your sequence inquiries. After the report is generated, use line commands to create other reports, such as a Sequence Detail Report.

**D (Sequence Detail Report)**

Displays detailed information about a specific sequence and its schema.
Role Reports

A role is a user-defined database entity that groups privileges together. A role can be assigned to a primary authorization ID or shared by all users (PUBLIC). The role is available only in a trusted context (which enables the establishment of a trusted relationship between a DB2 database management system and an external entity).

By assigning privileges to a role and then using trusted contexts to limit the circumstances in which the role can be used, you can reduce the risk of unauthorized use of privileges.

You can use CA RC/Query to generate role reports. You can enter selection criteria or make specific entries in the main menu fields to control the output of your reports.

**Note:** You can request these reports only if you are running DB2 9 and above.

The following report options are available for the role (RO) object type:

**Note:** The Creator field selects the role creator. The Qualifier field is used only for jumping to another type of report. The Grantor field is used to specify the user ID of the grantor of the privilege.

**L (Role List Report)**

Provides basic information about each role that matches your selection criteria. This report provides a Database Administrator with a simple report that lists information such as role, definer, and definer type of a specific role.

**D (Role Detail Report)**

Provides detailed information about a specific role. This report provides a Database Administrator with a detailed report on a specific role.

**SA (Role System Authorization Report)**

Displays system privileges that are granted to a role. System privileges include the ability to create databases and storage groups, perform BIND ADDs, and run DB2 utilities such as STOSPACE. You can select a specific user or role or you can select several by entering search or selection criteria.

Two character mnemonics are used to indicate system privileges. N/A indicates that the install SYSADM or SYSOPER IDs are not recorded completely in the DB2 catalog.
TA (Role Table Authorization Report)
Displays table privileges that are granted to the selected roles. The table privileges include being able to alter the table, create table indexes, and add, delete, update, insert, or select rows from the table. When a user or role holds specific column update privileges, the column names appear indented under the table name. To view all the users or roles that hold specific update privileges on a column, enter the C UA line command. This command displays a Column User or Role Authorization report.

DA (Role Database Authorization Report)
Displays all the database privileges that are granted to the selected roles. The database privileges include specifying administrator, control, or maintenance authority; create tables and tablespaces; drop databases, and run database utilities. One-character mnemonics indicate database privileges. To view a full screen display of all the authorizations for a specific database, enter DB UA (Database User Authorization) next to the database you are interested in.

DP (Role Dependencies Report)
Displays the dependent objects for each role.

DI (Role Drop Impact Report)
Provides information about the impact of a drop on the selected roles and dependent or otherwise related objects.

PA (Role Plan Authorization Report)
Displays the plan bind and execute privileges that are granted to the selected roles. This report lets you easily view the application plans a role can execute, bind, or free.

KA (Role Package Authorization Report)
Displays all the package privileges for each role selected.

RA (Role Resource Authorization Report)
Displays the USE privileges that are held by the selected roles on buffer pools, storage groups, and tablespaces (DB2 resources).

AA (Role All Authorizations Report)
Displays all authorizations for a specific role or group of roles in a consolidated report.
Storage Group Reports

A storage group is a DB2 object that represents a named set of DASD volumes controlled by a specified VSAM catalog. Storage groups are maintained and monitored by DB2 and are used for storage of DB2 tablespaces and indexspaces. A storage group can be assigned to a database, tablespace, or indexspace. All tables that reside in a given tablespace utilize that tablespace’s storage group.

The Storage Group reports display information that is necessary for monitoring storage group definitions, user authorizations, and object dependencies.

If your installation uses explicit VSAM definitions for table and indexspaces (versus DB2 storage groups), use the VSAM Catalog reports for displaying object and VSAM catalog dependencies.

For the Storage Group reports, the Creator field in the header always selects the creator of the storage group, and the Qualifier and Grantor fields generally are used only for jumping to other reports. The Storage Group User Authorization report is the exception. For this report, the Grantor field selects the grantor of the privilege. Use the scrolling keys to view information about additional storage groups.

The following report options are available for the storage group (SG) object type:

D (Storage Group Detail Report)
Displays a storage group’s definition and current space utilization as well as summary information for its dependent databases, tablespaces, indexspaces, and tables. Summary statistics are provided on this report for related objects.

Some of the columns on this report display information produced by the DB2 STOSPACE Utility. The date STOSPACE statistics were last updated is also displayed, so you can determine the accuracy of the statistics.

To improve performance when this report is generated, set the Full Detail profile option to N. This setting omits object counts from the report. To interrupt processing on a long-running detail report, use the ATTN key.

L (Storage Group List Report)
Displays a row of basic information for each storage group that matches your selection criteria. Multiple storage groups are shown on each page, and you can page through the report to view all the retrieved storage group information. This report is a good starting point for your storage group inquiries, because you can use it to find the storage groups about which you want more information. Storage groups are listed according to search criteria specified by you. You can then use the cursor select feature to display a related report about a displayed storage group.

Some of the columns on this report display information produced by the DB2 STOSPACE Utility. The date STOSPACE statistics were last updated is shown so that you can determine the accuracy of the statistics.
DB (Storage Group Database Report)
Displays databases dependent on the specified storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

TS (Storage Group Tablespace Report)
Displays tablespaces dependent on the specified storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

Some of the columns on this report display information produced when you update the DB2 catalog. If you have not updated information for a table's tablespace, N/A will appear in the dependent report columns.

T (Storage Group Table Report)
Displays tables dependent on selected storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

Some of the columns on this report display information produced when you update the DB2 catalog. If you have not updated information for a table's tablespace, N/A will appear in the dependent report columns.

I (Storage Group Index Report)
Displays indexes dependent on the specified storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

O (Storage Group Object Dependency Report)
Displays all objects, in a hierarchy format, which are dependent on the specified storage groups. The report reflects the hierarchy from the storage group down to the table and index levels. Only tablespaces that are defined to databases that are, in turn, defined to the storage group are included in the report. If a database is not defined as using the storage group, the database and all its tables will be omitted from the report, regardless of the storage group actually used by the tables and indexes.

Object creator fields are displayed when the Qualify feature is turned on. The number of view levels displayed is controlled by the View Levels feature.

V (Storage Group Volume Report)
Displays the volumes defined for the specified storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

UA (Storage Group User Authorization Report)
Displays the authorized users of specified storage groups. Multiple storage groups are displayed on each page, and you can page the report to view all information.

Note: For this report, the Grantor field selects the grantor of the privilege.
DI (Storage Group Drop Impact Report)

Lets you evaluate the impact of a drop on selected storage groups and on dependent or otherwise related objects.

LC (Storage Group LISTCAT Report)

Displays detail and summary space usage information for DB2 data sets associated with the selected storage group, which lets you quickly identify exceptional conditions.

Database Reports

A database is a logical collection of tables, associated indexes, and tablespaces. You can grant authority to a user to access all the data in a database as one unit. Physical data storage is not allocated to a database when it is created; instead, storage is allocated for a tablespace or indexspace within the database.

The Database reports display information that is necessary for monitoring DB2 database definitions, user authorizations, and object dependencies.

The Creator field selects the creator of the database except as noted in the following report descriptions. The Qualifier and Grantor fields are generally used only for jumping to other reports. The exceptions are the Database User Authorization and Database User Authorization List reports, where the Grantor field selects the grantor of the privilege.

Some of the report columns display information that is produced when you update the DB2 catalog. If you have not updated information for a tablespace, N/A appears in the dependent report columns.
The following report options are available for the database (DB) object type:

**D (Database Detail Report)**
Displays a database’s definition and dependent object summary statistics. Summary statistics are provided on this report for related objects. If you are interested in the details of the related objects, enter the appropriate Report Option to view the corresponding report.

To improve performance when this report is generated, set the Full Detail profile option to N. This setting omits object counts from the report. To interrupt processing on a long-running detail report, use the ATTN key.

**L (Database List Report)**
Displays a row of information for each selected database. This report is a good starting point for your database inquiries. You can use it to find the database you are interested in. Use the cursor select feature to display a related report about a displayed database.

**T (Database Table Report)**
Displays tables that are dependent on the selected databases.

The Creator field selects the creator of the database or the creator of the table, depending on whether a database or table is the line’s default object.

**P (Database Plan Report)**
Displays a row of information for each plan that is dependent on the tablespaces contained in the databases you specify. Because a database is a logical object, a plan is not really dependent on a database, but on a tablescape contained in the database.

The Creator field selects the creator or binder of the plan, not the creator of the database.

**V (Database View Report)**
Displays a row of information for each selected database that has view dependencies. The view references tables contained within the database in its SELECT statement. The report is sorted by database/view name. Thus, all views that reference a particular database are displayed together.

**I (Database Index Report)**
Displays the indexes that are dependent on the selected databases.

The Creator field selects the creator of the database.

**O (Database Object Dependency Report)**
Lists all objects in a hierarchical report format, which are dependent on the selected databases.

Object creator fields are displayed when the Qualify feature is turned on. The number of view levels displayed is controlled by the View Levels feature.
**TS (Database Tablespace Report)**

Displays the tablespaces that are dependent on the selected databases.

The Creator field selects the creator of the database, not the creator of the tablespace.

**UA (Database User Authorization Report)**

Displays database privileges granted to a user. Database privileges include, the ability to specify administrator, control, or maintenance authority, create tables and tablespaces, drop databases, and run database utilities.

This report is similar to the Database User Authorization List report, except that it displays each database's user authorization information. Use scrolling to view additional databases.

*Note:* The Grantor field selects the grantor of the privilege.

**UL (Database User Authorization List Report)**

Displays database privileges granted to a user. Database privileges include the ability to specify administrator, control, or maintenance authority, create tables and tablespaces, drop databases, and run database utilities.

This report is similar to the Database User Authorization report, except user authorization for a database is shown on a single line, and information for many databases is shown on a single panel.

*Note:* The Grantor field selects the grantor of the privilege.

**DS (Database Status Display Report)**

Provides a status overview of DB2 databases, tablespaces, and indexspaces. Also, this report indicates if a tablespace is in a check, copy, or recovery pending status.

This report works like the IBM -DISPLAY DATABASE command. However, the report provides more control than the IBM command. For example, you could generate the Database Status Display report in batch. This allows you to view the status of single or multiple databases on a daily basis during off-hours.

From this report, you can enter line commands, such as START, STOP, FSTART, FSTOP, to control object status.

The Status field enables you to quickly determine status discrepancies. The field is divided into the primary status identifiers (RW, RO, STOP, and UT) and qualifiers (for example, COPY, DEFER, CHKP). Any qualifiers appear after the primary identifier.

**DI (Database Drop Impact Report)**

Lets you evaluate the impact of a drop on selected databases and dependent or otherwise related objects.
LC (Database LISTCAT Report)

Displays detail and summary space usage information for DB2 data sets associated with the selected database, which lets you quickly identify exceptional conditions.

LR (Database LOB Relationship Report)

Displays LOB relationship information for DB2 data sets associated with the selected database. For this report, the qualifiers are the Database and Creator fields.

Tablespace Reports

A tablespace is a DB2 object consisting of VSAM ESDS data sets which contain one or more DB2 tables. When the tablespace is created, you designate its database and storage group. If you do not specify a database and storage group, DB2 uses DSNDB04 as the default database and SYSDEFLT as the default storage group.

The Tablespace reports display information necessary for monitoring tablespace definitions, access privileges, and object dependencies.

For Tablespace reports, the Creator field selects the creator of the tablespace. The Qualifier field selects the name of the database that contains the tablespace. The Grantor field is used only for jumping to another report, except on the Tablespace User Authorization report, where it selects the grantor of the privilege.

Some of the report columns display information that is produced when you update the DB2 catalog. If you have not updated information for a table's tablespace, N/A appears in the dependent report columns.

The following report options are available for the tablespace (TS) object type:

D (Tablespace Detail Report)

Displays information about a database, including creator, internal identification, and storage information; erase and close rules; and the availability of the tablespace, space statistics, and table statistics. Information is presented for each partition for partitioned tablespaces.

L (Tablespace List Report)

Displays a row of information for each tablespace that matches your selection criteria. You can then use the cursor select feature to display a related report about a displayed tablespace. Multiple tablespaces are shown on each page. You can page the report to view all the retrieved tablespace information. This report is a good starting point for your tablespace inquiries.

P (Tablespace Plan Report)

Provides information about plans that are dependent on the specified tablespaces.
T (Tablespace Table Report)
Displays information about the tables that are contained in the specified tablespace.

LR (Tablespace LOB Relationship Report)
Displays LOB relationship information for the DB2 data sets that are associated with the specified tablespace.

For this report, the qualifiers are the Tablespace, Database, and Creator fields.

PL (Tablespace Partition List Report)
Displays partition information for the DB2 data sets that are associated with the specified tablespace.

O (Tablespace Object Dependency Report)
Displays all objects in a hierarchical report format that is dependent on the specified tablespaces.

Object creator information is displayed when the Qualify feature is turned on. The number of view levels displayed is controlled by the View Levels feature.

UA (Tablespace User Authorization Report)
Displays tablespace privileges granted to users.

The Grantor field selects the grantor of the privilege.

PK (Tablespace Package Report)
Provides information about the packages that are dependent on the specified tablespace.

DI (Tablespace Drop Impact Report)
Enables you to evaluate the impact of a drop on selected tablespaces and dependent or otherwise related objects.

LC (Tablespace LISTCAT Report)
Displays detail and summary space usage information for the DB2 data sets that are associated with the selected tablespace, enabling you to quickly identify exceptional conditions.

EG (Tablespace Eligible for PBG List Report)
Displays a row of basic information for each tablespace that is eligible to be a partition-by-growth (PBG) tablespace and matches your selection criteria. You can run the CPBG line command from this report to convert tablespaces into partition-by-growth (PBG) tablespaces.
Buffer Pool Reports

Buffer pools are areas of virtual storage that temporarily store pages of tablespaces and indexes temporarily. The buffer pool chosen implicitly determines the page sizes of tables. A buffer pool can be 4 KB or 32 KB in size.

Buffer pools are specified for databases, tablespaces, and indexspaces.

The Buffer Pool reports display the information available in the DB2 system catalog concerning DB2 buffer pools and their related objects. These reports help you evaluate the impact of your buffer pool decisions on your DB2 system.

The following report options are available for the buffer pool (BP) object type:

**Note:** The Creator field in the header is used differently for each buffer pool report. The Qualifier and Grantor fields are generally used only for jumping to other reports. The exception is the Buffer Pool User Authorization report, where the Grantor field selects the grantor of the privilege. Some of the report columns display information produced when you update the DB2 catalog. If you have not updated information for a table's tablespace, N/A appears in the dependent report columns.

**L (Buffer Pool List Report)**
- Lists buffer pools that are referenced in the DB2 system.
- This report accepts only an asterisk (*) in the Buffer Pool field in the header.

**T (Buffer Pool Table Report)**
- Displays all the tables that use each buffer pool selected. You can choose a specific buffer pool or select several by entering selection criteria.
- The Creator field in the header selects the creator of the table.

**P (Buffer Pool Plan Report)**
- Displays all the plans that use each buffer pool selected. A plan's buffer pool utilization is based on the databases and tablespaces or indexspaces accessed by the plan.
- The Creator field in the header selects the creator/binder of the plan.

**I (Buffer Pool Index Report)**
- Displays all the indexes that use each buffer pool selected.
- The Creator field in the header selects the creator of the index (indexspace).

**DB (Buffer Pool Database Report)**
- Displays all the databases that use each buffer pool selected. Tablespaces and indexspaces defined within each database can specify or use a buffer pool different from the one the database uses. The database buffer pool is the default.
- The Creator field in the header selects the creator of the database.
TS (Buffer Pool Tablespace Report)
Displays all the tablespaces that use the selected buffer pools.
The Creator field in the header selects the creator of the tablespace.

UA (Buffer Pool User Authorization Report)
Displays the authorized users of a buffer pool.
The Grantor field selects the grantor of the buffer pool privileges.

DS (Buffer Pool Display Status Report)
Displays the status of all selected buffer pools and lets you quickly determine status discrepancies. Generate this report in batch to view the status of single or multiple buffer pools on a daily basis during off-hours.

This report is similar to the IBM DISPLAY BUFFERPOOL command; however, the report provides more control than the IBM command. For example, you can generate this report in batch to view the status of single or multiple buffer pools on a daily basis during off-hours.

Use line commands like START, STOP, FSTART, and FSTOP to control object status. Use EQF to further control the objects listed.

History Table Reports

The History Table reports display the information that is available in the DB2 system catalog concerning DB2 history tables and their related objects.

Use the L (List History Tables) report option for the history (H) object type to view data from DB2 catalog history tables. You can view:
- Base table detail (valid for tables and indexes)
- Base history table detail
- History table partition data (valid for tables and indexes)
- History table statistics (valid for tables and indexes)

The following table lists the available report options for the history object type and shows how header fields are used for a particular report:

<table>
<thead>
<tr>
<th>Report Option</th>
<th>Item Name</th>
<th>Creator</th>
<th>Qualifier</th>
<th>Grantor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column Detail (C)</td>
<td>Col.Name</td>
<td>Table Creator</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dist Cols (CD)</td>
<td>Col.Name</td>
<td>Table Owner</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Index History (HD)</td>
<td>Name of Index</td>
<td>CR of Index</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Overview of History Table Reports

The History Table reports display the information available in the DB2 system catalog concerning DB2 history tables and their related objects.

To display information from all history tables, specify **H** for DB2 Object and **L** for Option on the Main Menu.

In the following table, the Type and Table columns indicate the table from which data comes. The History reports can be restricted to rows specified in the Item Name and Creator fields (the % character indicating like can also be used):

<table>
<thead>
<tr>
<th>Type</th>
<th>Item Name</th>
<th>Creator</th>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDIS</td>
<td>NAME</td>
<td>TBOwner</td>
<td>SYSIBM.SYSCOLDIST_HIST</td>
</tr>
<tr>
<td>COLM</td>
<td>NAME</td>
<td>TBCreator</td>
<td>SYSIBM.SYSCOLUMNS_HIST</td>
</tr>
<tr>
<td>INDP</td>
<td>IXNAME</td>
<td>IXCreator</td>
<td>SYSIBM.SYSINDEXPART_HIST</td>
</tr>
<tr>
<td>INDS</td>
<td>NAME</td>
<td>OWNER</td>
<td>SYSIBM.SYSINDEXSTATS_HIST</td>
</tr>
<tr>
<td>INDX</td>
<td>NAME</td>
<td>CREATOR</td>
<td>SYSIBM.SYSINDEXES_HIST</td>
</tr>
<tr>
<td>LOBS</td>
<td>NAME</td>
<td>DBNAME</td>
<td>SYSIBM.SYSLOGSTATS_HIST</td>
</tr>
<tr>
<td>TABL</td>
<td>NAME</td>
<td>CREATOR</td>
<td>SYSIBM.SYSTABLES_HIST</td>
</tr>
<tr>
<td>TABP</td>
<td>TSNAME</td>
<td>DBNAME</td>
<td>SYSIBM.SYSTABLEPART_HIST</td>
</tr>
<tr>
<td>TABS</td>
<td>NAME</td>
<td>OWNER</td>
<td>SYSIBM.SYSTABSTATS_HIST</td>
</tr>
</tbody>
</table>
You can also display a subset of the list, by specifying **HL** in the Option field, and an appropriate value in the DB2 Object field.

The following table lists available values for the DB2 Object field:

<table>
<thead>
<tr>
<th>DB2 Object</th>
<th>Types Displayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Displays COLM and CDIS types.</td>
</tr>
<tr>
<td>I</td>
<td>Displays INDX, INDP, and INDS types.</td>
</tr>
<tr>
<td>T</td>
<td>Displays TABL, TABP, and TABS types.</td>
</tr>
<tr>
<td>L</td>
<td>Displays LOBS type only.</td>
</tr>
</tbody>
</table>

The History Detail Reports are accessed from the main menu.

### Column History Inquiry

To display the column detail inquiry history report, enter **C** in the DB2 Object field and **HD** in the Option field of the Column Detail Inquiry panel.

**Note:** Displayed column names and values are taken from SYSIBM.SYSCOLUMNS_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.

### ColDist History Inquiry

To display the dist cols history report, enter **CD** in the DB2 Object field and **HD** in the Option field of the Dist.Cols panel.

**Note:** Displayed column labels and values are taken from SYSIBM.SYSCOLDIST_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8. Use F10 and F11 to scroll within a single item.

### Index Detail History

To display the Index Detail History report, enter **I** in the DB2 Object field and **HD** in the Option field of the Index Detail History panel.

**Note:** Displayed column labels and values are taken from SYSIBM.SYSINDEXES_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.
Index Partition History Inquiry

To display the Index Partition History Inquiry report, enter I in the DB2 Object field and HP in the Option field of the Index History Inquiry panel.

Note: Displayed column labels and values are taken from SYSIBM.SYSINDEXPART_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8. Use F10 and F11 to scroll within a single item.

Index Stats History Inquiry

To display the Index Stats History Inquiry report, enter I in the DB2 Object field and HS in the Option field of the Index History Inquiry panel.

Note: Displayed column labels and values are taken from SYSIBM.SYSINDEXSTATS_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.

LOB Stats History Inquiry

To display the LOB Stats History Inquiry report, enter L in the DB2 Object field and HD in the Option field on the LOB panel.

Note: Displayed column labels and values are taken from SYSIBM.LOBSTATS_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.

Table History

To display the Table history report, enter T in the DB2 Object field and HD in the Option field of the Table History panel.

Note: Displayed column labels and values are taken from SYSIBM.SYSTABLES_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.
Table Partition History

To display the Table Partition history report, enter T in the DB2 Object field and HP in the Option field of the Table History panel.

*Note:* Displayed column labels and values are taken from SYSIBM. SYSTABLEPART_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.

Table Stats History

To display the Table Stats history report, enter T in the DB2 Object field and HS in the Option field of the Table History panel.

*Note:* Displayed column labels and values are taken from SYSIBM. SYSTABSTATS_HIST. All rows corresponding to the values specified in History Tab and Creator are retrieved and scrolled using F7 and F8.

User Reports

The user reports display the authorized users or roles for each of the DB2 privilege classes: system, table, database, plan, package, and use (resource).

*Note:* Authorizations for collections are stored with the User/Resource privilege class.

For user reports, the Creator and Qualifier fields in the header are used only to jump to other reports. The Grantor field selects the grantor of the privilege.

*Note:* If you want to view the authorizations by DB2 object type versus by user, use the authorization reports provided for each object type. For example, if you want to view the authorizations by database, use the Database User Authorization report.
The following report options are available for the user (U) object type:

**SA (User System Authorization Report)**

Displays system privileges granted to a user. System privileges include the ability to create databases and storage groups, perform BIND ADDs, and run DB2 Utilities such as STOSPACE. You can choose a specific user or select several by entering search or selection criteria. Because of the amount of information displayed on this report, two-character mnemonics are used to indicate system privileges.

N/A might appear for some of the IDs on the report if Install SYSADM/SYSOPER IDs are not completely recorded in the DB2 catalog.

**TA (User Table Authorization Report)**

Displays table privileges granted to the selected users. Table privileges include the ability to alter the table and create table indexes, as well as add, delete, update, insert, or select rows from the table.

When a user holds specific column update privileges, the column names will be indented under the table name. If you want to view all users that hold specific update privileges on a column, enter the line command C UA in the CMD field next to the column to request a Column User Authorization report.

**DA (User Database Authorization Report)**

Displays all the database privileges granted to selected users. Database privileges include the ability to specify administrator, control, or maintenance authority; create tables and tablespaces; drop databases; and run database utilities. Because of the large amount of information displayed on this report, one-character mnemonics are used to indicate database privileges.

You can jump to the Database User Authorization report to view a full screen display (with all codes translated) of all the authorizations for a specific database. To do this, enter the line command DB UA in the CMD field corresponding to the database you want.

**PA (User Plan Authorization Report)**

Displays the plan bind and execute privileges granted to selected users. This report lets you easily view the application plans a user can execute, bind, or free.

The report is sorted by the user ID of the grantee and can be paged with the F keys.

**KA (User Package Authorization Report)**

Displays all the package privileges for each user selected. This report displays the same information as the Package User Authorization report, sorted on the user name.
RA (User Resource Authorization Report)
Displays the USE privileges held by selected users on buffer pools, storage groups, and tablespaces (DB2 resources).

AA (User All Authorizations Report)
Displays all authorizations for a specified user or group of users in a consolidated report.

Note: Currently, no EQF support exists for the User All Authorizations report.

System Reports
The System reports the following information about your DB2 system and installation:
- DB2 and QMF resource limits
- Installation of your DB2 system
- Execution of the DB2 COPY (full or partial), LOAD, REORG, and other utilities

These reports can also provide backup file names and volume serial numbers for performing tablespace restores.

Note: To jump to other reports, use the Creator, Qualifier, and Grantor fields.
The following report options are available for the system (SY) object type:

**IC (System Image Copy Detail Report)**

Displays all the image copies performed for each tablespace in the selected databases. Image copies are displayed in the order of the most recent execution within a tablespace. The type of image copy is shown along with its location.

The Item Name field accepts the database name alone or the database and tablespace names. If you specify only a database name in the Item Name (database) field, the report displays all tablespaces within the database. To view the report for a specific tablespace, enter the database and tablespace names (in the format `database.tablespace`). To view a report by tablespace name only, enter `*.tablespace-name`.

**L (System List Reports for DB2 Utilities)**

Displays a log of when the COPY, LOAD, REORG, QUIESCE, and RECOVER utilities were executed for the selected databases. To aid in determining the recoverability of a tablespace, the utilities are displayed in the order of the most recent execution within each database. From this list, you can generate a System Image Copy Report to find the tape or DASD device where the image copy resides.

The Item Name field accepts the database name alone or the database and tablespace names. If you specify only a database name in the Item Name (database) field, the report displays all tablespaces within the database. To view the report for a specific tablespace, enter the database and tablespace names (in the format `database.tablespace`). To view a report by tablespace name only, enter `*.tablespace-name`.

**Z (System DSNZPARMS Report)**

Provides valuable information about the parameters used during installation. This information includes:

- Maximum and Minimum Values—The maximum and minimum values permitted by DB2 for each parameter.
- Current Value—The value specified at installation time is the current parameter value.
- Macro—The name of the installation macro in which the parameter is specified.

Information is grouped by subject matter to make it easier to find.

**Note:** For each parameter listed, the maximum and minimum values allowed by DB2 and the current value are listed. Information is grouped by subject matter, so it is easy to find and use.
DSNZPARM is the default member name for the load module that is used by the START DB2 command. This module contains macros that describe DB2 execution time options by parameter names and values.

The parameters that you see depend on the level of DB2 you are running.

**Note:** The header fields and the SQL command are not valid for this report. No SQL is generated.

**UT (System Utility Display Report)**

Shows the status of utility jobs. This report is useful for monitoring the progress of long-running utility jobs. You can use the TERM (terminate) line command from this report. This command lets you terminate jobs that are stopped or out of control directly from the report.

The Item Name field in the header selects the UTILITY-ID. This is the value provided to the DSNU CLIST. It is generally in the format `userid.jobname`. To view all utility jobs or a partial UTILITY-ID, use an asterisk (*). The percent (%) or underscore (_) search characters are not accepted. For example, you can display a report on all your utility jobs by entering your user ID followed immediately by an asterisk.

**R (System Routine Detail Report)**

Displays detailed information for the selected routines.

**CD (System Communication Database Report)**

Displays information about your connections with remote DB2 subsystems. This report also provides access to data at remote locations through the Distributed Data Facility (DDF). This report has the following groupings:

**LUNAME Information**

Provides general information from the SYSLUNAMES table. The SYSLUNAMES table associates a mode with each remote subsystem to which local subsystem can send a query. Scroll commands are not supported.

**User Authorization Information**

Provides information from the SYSLUNAMES table that pertains to user authorization. This information includes the ID translation requirements. Scroll commands are supported.
Mode Select Information

Provides information from the SYSLUMODES and SYSMODESELECT tables. SYSLUMODES provides VTAM with conversation limits for specific LUNAME and MODENAME combinations. Scroll commands are supported.

The fields pertaining to mode select are valid only when the value of MODESELECT for SYSLUNAMES is Y. DB2 uses the following search order to search for MODE SELECT information:

- LUNAME.MAUTHID.PLANNNAME
- LUNAME.MAUTHID.blank
- LUNAME.blank.PLANNNAME
- LUNAME.blank.blank

Information from SYSMODESELECT is used to map authorization IDs and application plans to modes. You can use this information to help ensure that certain IDs using specific plans will always have a predefined class of service suited for that operation.

This information is valid only when the value of MODESELECT for SYSLUNAMES is Y.

Note: For more information about the DDF, see the IBM DB2 Administration Guide.

CS (System Character Set Translation Tables Report)

Provides basic information about your character conversion tables and displays the actual translation table rows. Character conversion tables are used for converting character strings from one method of encoding to another. This is necessary, for example, when character data is fetched from a table in another DBMS.

Character conversion is achieved by means of the coded character set identifier (CCSID), a two-byte, unsigned binary integer. Every string used in an SQL operation has a CCSID to identify the manner in which the characters in the string are encoded.

The Item Name field selects the OUTCCSID, which is the method of encoding used by the target character string. The Qualifier field selects the INCCSID, which is the method of encoding used by the source character string.
RL (System DB2 Resource Limit Report)

Displays the resource limit specification tables used by the DB2 Resource Limit Facility (RLF). This report shows how DB2 controls the use of resources when the selected RLF table is started.

The Item Name field in the header selects the name of the resource limit table. All resource limit table names begin with DSNRLST. The Creator field selects the creator of the RLF table.

You can add additional columns to the resource limit table. If you have not added the new columns that are available with your version of DB2, the column headings will display, but no information will appear.

Q (System QMF Resource Limit Report)

Displays the view that is used by an installed governor exit routine to control the use of QMF resources. QMF permits the governor, which can be supplied by IBM or by another vendor, to access the view and control the use of resources.

The Item Name field selects the name of the resource group.

D (System DSNHDECP Parameters Report)

Presents valuable information about the application programming defaults. The DSNHDECP values specified are used as default values by the program preparation panels, the program preparation CLIST(DSNH), and the precompiler. They can also be used as defaults by other programs such as the IBM Query Management Facility (QMF). The values are contained in load module DSNHDECP, in library prefix:SDSNEXIT.

VSAM Catalog Reports

The VSAM Catalog reports display the VSAM catalogs that are referenced by DB2 objects. The VSAM catalogs are used to track the VSAM data sets that are allocated for tablespaces and indexspaces. VSAM data sets can be implicitly or explicitly defined.

- Implicit definition—If a storage group is specified when creating a tablespace or indexspace, DB2 will automatically allocate the necessary VSAM data sets, and track, maintain, and report on the space utilization (STOSPACE utility) of those data sets.

  The VSAM catalog specified when creating the storage group or database is used to keep track of these internally allocated VSAM data sets. Thus, the VSAM catalog is implicitly defined by the storage group or database.

- Explicit definition—When creating a tablespace or indexspace, you can explicitly name the VSAM catalog to use for the VSAM data sets instead of referencing a storage group. In this case, you must define your own VSAM data sets in the specified VSAM catalog for holding the tablespace or indexspace data.
When the VSAM data sets are defined explicitly, DB2 does not perform space monitoring and tracking on the VSAM data sets.

For the VSAM catalog reports, the Qualifier and Grantor fields are used only for jumping to other reports.

Some of the columns on these reports display information produced when you update the DB2 catalog. If you have not updated information for a tablespace, for example, N/A will appear in the dependent report columns.

The following report options are available for the VSAM catalog (VC) object type:

L (VSAM Catalog List Report)

Displays the names of all VSAM catalogs (explicit and implicit) referenced in the DB2 system. Use this report as a good starting point for VCAT query sessions using line commands to display related reports. For example, enter TS in the CMD line to generate a VCAT tablespace report for any of the displayed VCATs.

Note: For VSAM Catalog List reports, the VCAT name cannot be specified; only * is accepted. The Creator prompt is ignored.

TS (VSAM Catalog Tablespace Report)

T (VSAM Catalog Table Report)

I (VSAM Catalog Index Report)

Provides information about the tables, tablespaces, and indexes (respectively) that refer to the specified VSAM catalogs. They display all VSAM catalogs used by storage groups, tables, tablespaces, and indexspaces regardless of how they were defined (explicitly or implicitly).

The Creator field selects the creator of the tablespace, table, or index.

The VSAM Catalog Tablespace report displays the tablespaces in each VSAM catalog. The VSAM catalog used by a tablespace is defined at creation. The report is sorted by VCAT name.

The VSAM Catalog Table report displays the tables in each VSAM catalog. You can choose a specific VCAT name or select several by entering search or selection criteria.

The VSAM Catalog Index report displays the indexes in each VSAM catalog. The VSAM catalog used by an index (indexspace) is defined at creation.

P (VSAM Catalog Plan Report)

Provides basic information about the plans dependent on specified VSAM catalogs. A plan is dependent on a VSAM catalog if it references DB2 objects tracked by the catalog. Because a plan can be dependent on several DB2 objects, and those DB2 objects can be stored on different storage devices (and thus possibly different VSAM catalogs), a plan name can appear more than once on this report.
Trusted Context Reports

**LC (VSAM Catalog LISTCAT Report)**

Displays detail and summary space usage information for DB2 data sets associated with the selected VSAM catalog. This report lets you quickly identify exceptional conditions.

**SG (VSAM Catalog Storage Group Report)**

Displays detail and summary usage information for DB2 data sets associated with the selected VSAM catalog. This report lets you quickly identify exceptional conditions.

**Trusted Context Reports**

A **trusted context** is a database security object that enables the establishment of a trusted relationship between a DB2 database management system and an external entity.

By assigning privileges to a role and then using trusted contexts to limit the circumstances in which the role can be used, you can reduce the risk of unauthorized use of privileges.

You can use CA RC/Query to run trusted context reports.

You can enter selection criteria or make specific entries in the main menu fields to control the output of your reports.

**Note:** You can request these reports only if you are running DB2 9 and above.

The following report options are available for the trusted context (TC) DB2 object type:
- L (Trusted Context List Report)
- D (Trusted Context Detail Report)
- UA (Trusted Context User Authorization Report)—Lists the authorization IDs with which a trusted context can be used.

**Plan Reports**

The plan reports display information about DB2 application plans. Application plans are the bound application programs that access DB2 data. Any application program that accesses DB2 has an application plan. The plan defines the relationship between the program and its DB2 data.
The following report options are available for the plan (P) object type:

**Note:** For Plan reports, the Creator field in the header selects the creator of the application plan, and the Qualifier and Grantor fields are generally used only to jump to other reports. The exception is the Plan User Authorization report, where the Grantor field is used to specify the grantor of the privilege. In the Plan Name field, Plan Explain and Plan Statement reports accepts the plan name alone, or the plan and DBRM names (in the format plan.DBRM). To select on the DBRM name only, enter *.DBRM, where DBRM is the DBRM name.

**D (Plan Detail Report)**

Lists detail information concerning an application plan. This report is useful for understanding the resource requirements and size of an application plan. For example, you can use this report to determine the resource allocation requirements of the CA RC/Query application plan RQPMAIN.

To improve performance when this report is generated, set the Full Detail profile option to N. This setting omits object counts from the report. To interrupt processing on a long-running detail report, use the ATTN key.

**L (Plan List Report)**

Displays basic information for an application plan and is sorted by plan name.

**DP (Plan Dependency Report)**

Lists all the DB2 objects that are referenced by an application plan. This report lets you quickly evaluate the DB2 objects affected by a plan or to find the plans that reference a particular object.

**E (Plan Explain Report)**

Provides very detailed DB2 performance and optimization information concerning the statements in an application plan. This information is valuable to the application developer for fine-tuning the application and understanding its DB2 processing requirements. The following columns can be added to the PLAN_TABLE: PREFETCH, COLUMN_FN_EVAL, and MIXOPSEQ.

To use this report option, bind an application with the EXPLAIN (YES) option. DB2 places the information generated by the EXPLAIN (YES) option into a special table (creator.PLAN_TABLE, where creator is the binder's ID). Selection criteria cannot be specified in the Plan Name and Creator fields. One of these fields must contain a specific name. The Plan Name field will accept the plan name alone, or both the plan and DBRM names (in the format plan.DBRM). To select on the DBRM name only, enter *.DBRM, where DBRM is the DBRM name.

**Note:** The Creator field should specify the creator of PLAN_TABLE. Plan Explain reports require a specific creator, not SQL wildcards, and defaults to the creator of the specified plan. For more information about creating the PLAN_TABLE, see the *IBM SQL Reference* manual.
CL (Plan Collection Report)

Lists all collections associated with a plan without enlarging the report by not providing information about the packages. The Location, Collection, and Timestamp columns show location, collection, and date/time information for the collections associated with the plan. This information is indented under the line with the plan name. If the subsystem where the collection resides is unavailable, the SQL code appears in the Collection field.

DR (Plan DBRM Detail Report)

Displays all the DBRMs defined for an application plan. The Creator field selects the creator of the plan, not the DBRM. A DBRM is a partitioned data set (PDS) member that stores information representing a program's source SQL. The DBRMs are used by the bind step to create an application plan.

UA (Plan User Authorization Report)

Displays the plan privileges for all the authorized users of an application plan.

ST (Plan Statement Report)

Lists the actual SQL statement text contained within an application plan. The Plan Name field accepts the plan name alone, or the plan and DBRM names (in the format plan.DBRM). To select on the DBRM name only, enter *.DBRM, where DBRM is the DBRM name. You can also list the SQL contained within a DBRM in an application plan.

You can page through the SQL statements by using the PF scrolling keys. Each page of the report displays the SQL statements present in one of the plan's DBRMs. Use the horizontal scrolling keys to scroll the data for each plan/DBRM. Use the vertical scrolling keys to scroll between plans/DBRMs.

The Plan Statement report can be used to easily page through the actual SQL statements used by an application plan (or DBRM). For example, you could use this report to view CA RC/Query SQL statements (plan name RQPAnnnn, where nnnn is the version number).
PK (Plan Package Report)

Provides basic information about the packages that can be accessed by a plan. The Location, Collection, and Package columns show location, collection, and name for the packlists and packages referenced by the plan. The packlist information is listed, starting on the line following the plan name, and the information for each package is listed immediately following the packlist line. If the subsystem where the package resides is unavailable, the SQL code appears in the Collection field.

CN (Plan Connection Report)

Lists the system connection types and shows whether they are enabled or disabled for one or more plans. Connection names can be specified to identify which connections, within a connection type are enabled or disabled. When connection names for a connection type are listed as enabled, any connection names not listed for the connection type are disabled. When connection names for a connection type are listed as disabled, any connection names not listed for the connection type are enabled.

Collection Reports

The Collection reports provide information such as collection dependencies, number of packages and versions in a collection, and package user authorizations for a collection.

A collection is a means of grouping similar packages together based on a common application, geographic area, or owner.

The following report options are available for the collection (CL) object type:

Note: For Collection reports, the Creator field selects the owner of the package, and the Qualifier field is used only when requesting another type of report. The Grantor field is used only for the Collection User Authorization report.

L (Collection List Report)

Lists collection names along with the number of packages and versions for each collection. Use the Creator field to request a list of all the collection names used by a specific package owner.

If you enter the PK (PACKAGE) line command next to any of the collections, you will access the Collection Package report, which lists the packages in the collection.

DP (Collection Dependency Report)

Lists the dependencies for one or more collections and shows the number of packages and versions in the collection. Use the Creator field to request a list of all the collection names used by a specific package owner.
PK (Collection Package Report)

Lists the packages in the collections you specify. It includes the same information as the Package List report except it is sorted by collection name.

UA (Collection User Authorization Report)

Displays the package privileges for authorized users of packages in one or more collections. Only the authorizations of existing packages will be shown.

The Grantor field specifies the user ID of the grantor of the package privilege.

Package Reports

The Packages feature makes it easier to manage your DB2 application plans.

A package is a single bound DBRM (Database Request Module) created using the BIND PACKAGE command. A DBRM consists of SQL statements separated from an application program by the precompiler.

An application plan is an entity created with the BIND PLAN command. With the introduction of packages, a plan can contain DBRMs or packages or both.

Among the many benefits of using packages is the reduction of BIND time. When a plan references packages, binding can be done at the package level, rather than at the plan level; using a version identifier for packages is another important benefit; you can have multiple versions of the same DBRM name on a single DB2 subsystem. This provides improved recovery and fallback, as well as the ability to store test and production data on the same DB2 subsystem.

Package names are in the following format:

LOCATION.COLLECTION_ID.PACKAGE.VERSION_ID

The location specifies where the package was bound. The collection ID identifies a logical group name assigned to the package at BIND time. For example, a collection ID called TEST would identify all the packages associated with your test plans. Package is the name of the package. The version ID is the value given at precompilation time for the VERSION parameter.

Use the Version field in the Package report headers to determine which version of the package you want to view.

All Package report options, except Package Explain, accept SQL selection criteria in the Name, Creator, and Collection fields, and accept extended queries. The Grantor field is used only for the Package User Authorization report. It is included on all the Package reports to let you specify a Grantor when requesting another report.
The following report options are available for the package (PK) object type:

**D (Package Detail Report)**
- Lists detail information concerning packages.

**L (Package List Report)**
- Displays information for the selected packages and is sorted by package name. This report is a good place to begin when you want to view packages defined in the DB2 system. You can specify a single package or select several by entering selection criteria.
- After the Package List report appears, you can use line commands to display reports (such as Package Detail reports) about individual packages.
- The Creator prompt selects the owner of the package. The Qualifier field selects the collection name.

**DP (Package Dependency Report)**
- Lists all the DB2 objects that are referenced by a package. This report lets you quickly review the DB2 objects affected by a package or to find the packages that reference a particular object.
- You can select specific packages by entering selection criteria in the Name, Creator, Collection, and Version fields.
- The Creator field selects the owner of the package; the Qualifier field selects the collection name.
- If you specify an asterisk (*) in the Version field or leave it blank, CA RC/Query searches for matching rows. If no matches are found, the report is not generated.

**Note:** To retrieve all rows that match your specified selection criteria, specify % in the Version field.

**E (Package Explain Report)**
- Provides detailed DB2 performance and optimization information concerning the statements within a package.
- Before you can generate a Package Explain report for a package, the package must be bound with the EXPLAIN (YES) option. DB2 stores the information generated by the EXPLAIN (YES) option in a special table. The table’s name is creator.PLAN_TABLE, where creator is the authorization-ID of the BIND process.
- To generate a Package Explain report, complete the Creator field with the creator of PLAN_TABLE. The Creator field cannot contain SQL wildcards, and will default to your current SQL ID. The Qualifier field selects the collection name, and the Grantor field is used only for jumping to other reports.

**Note:** For Package Explain reports, the Creator field specifies the creator of the PLAN_TABLE. This field cannot contain SQL wildcards, and defaults to your current SQL ID.
ST (Package Statement Report)
Lists the actual SQL statement text contained within a package. You can choose a specific package or select several by entering selection criteria.

The Creator field selects the owner of the package. The Qualifier field selects the collection name.

Use the scrolling keys to page through the SQL statements.

UA (Package User Authorization Report)
Displays the package privileges for all authorized users of one or more packages. You can choose a specific package or select several by entering selection criteria in the Name, Creator, Collection, or Grantor prompts.

The Creator field selects the owner of the package, and only displays authorizations of existing packages. The Qualifier field selects the collection name. The Grantor field specifies the user ID of the grantor of the privilege.

CN (Package Connection Report)
Lists the system connection types for a package and shows whether they are enabled or disabled. Connection names can be specified to identify which connections, within a connection type are enabled or disabled. When connection names for a connection type are listed as enabled, any connection names not listed for the connection type are disabled. When connection names for a connection type are listed as disabled, any connection names not listed for the connection type are enabled.

The Creator field selects the owner of the package. The Qualifier field selects the collection name.

P (Package Plan Report)
Lists the associated plan information for a specific package.

DBRM Reports
A Database Request Module (DBRM) is a partitioned data set (PDS) member that stores information representing a program's source SQL. DBRMs are used by the bind process to create an application plan. The DBRM reports make it easier to monitor and maintain your DBRMs.

For DBRM reports, the Creator field selects the creator of the plan. The Qualifier field is the plan name. Use the Grantor field for jumping to other reports.
The following report options are available for the DBRM (DR) object type:

**L (DBRM List Report)**
Displays all the plans for which a DBRM has been defined and information about the DBRM.

**ST (DBRM Statement Report)**
Lists the actual SQL statement text contained in one or more DBRMs. Use selection criteria to select one or more DBRMs.

### LOB Reports

The following report options are available for the LOB (L) object type:
- HD (LOB History Detail Report)
- HL (LOB History List Report)

### Routine Reports

A routine can be any “user-defined” function or stored procedure.

The routine reports display the information that is available in the DB2 system catalog concerning DB2 user-defined functions, stored procedures, and their related objects. You can use these reports to view information from the DB2 catalog regarding routines. Examples of such information include user-defined functions, cast functions, and stored procedures.

For routine reports, the Qualifier field is used only for jumping to another type of report. The Grantor field is also inactive, except for selecting the grantor of the privilege for the Routine User Authorization Inquiry report.

The Creator field selects the creator of the routine. The Qualifier and Grantor fields are used only for jumping to other reports.

The following report options are available for the routine (RO) object type:

**D (Routine Detail Report)**
Displays a full page of detailed information for the selected routines. This detailed information includes the origin of the routine, the number of parameters, the implementation language of the routine, the schema and specific name of the source user-defined function, and the return value after the routine has been executed.

**PD (Routine Parameter Detail Report)**
Displays details about the parameters that are required for the selected routines.
PK (Routine Package Report)

Displays the packages dependent on the selected routines and provides basic information about these packages.

L (Routine List Report)

Displays a row of information for each routine that matches your search and selection criteria. This report is a good starting point for your routine inquiries because you can use it to find routines about which you want further information. You can then use the line commands to select other reports, such as the Routine Detail report.

UA (Routine User Authorization Report)

Displays all the authorized users for each routine selected. This report can be used to determine the effect of dropping a routine on the user community and to verify routine security.

The Grantor field selects the grantor of the privilege.

**Schema Reports**

The Schema reports display cross-reference information for all schemas defined in the DB2 system.

When tables, views, indexes, and aliases are created, they are given a qualified name. When the qualified name is a two-part name, the first part (an authorization ID) is a qualifier that distinguishes the object from other objects that have the same name and the second part is the name of the object. The qualifier of user-defined distinct types, user-defined functions and triggers, and stored procedures, is a schema name.

When tables, views, indexes, and aliases are created, they are given a qualified name. When the qualified name is a two-part name, the first part (an authorization ID) is a qualifier that distinguishes the object from other objects that have the same name and the second part is the name of the object. The qualifier of user-defined distinct types, user-defined functions and triggers, and stored procedures, is a schema name.

All objects qualified by the same schema name can be thought of as a group of related objects. A schema name has a maximum length of 8 bytes.

The following report options are available for the schema (SC) object type:

L (Schema List Report)

Provides a report that includes information such as the number of routines, distinct types, and triggers that are grouped by a certain schema.

DT (Schema Distinct Types Report)

Provides information about distinct types, grouped by the schema field. Information provides includes owner, source schema, metatype, length, scale, and so on.
R (Schema Routine Report))

Provides information about routines, grouped by the schema field. Information provided includes name, creator, owner, type, source, number of parameters, language, and so on.

TG (Schema Triggers Report))

Provides information about triggers, grouped by the schema field. Information provided includes name, owner, time, event, granularity, and so on.

UA (Schema User Authorization Report)

Provides information about user authorizations, grouped by the schema field. Information provided includes grantee, grantor, authority level, and so on.

**Trigger Reports**

The Trigger reports display cross-reference information for all triggers defined in the DB2 system.

A trigger is a schema object that defines a set of actions (SQL statements) that are to be executed when a specific SQL data change operation occurs on a specified table.

Triggers provide automatic execution of a set of SQL statements whenever a specified event occurs. These SQL statements can validate and edit database changes, read and modify the database, and invoke functions that perform operations both inside and outside the database.

Triggers provide several improvements to the development and execution of DB2 applications:

- Faster application development—Because triggers are stored in the database, the actions performed by triggers do not have to be coded in each application.
- Code reusability—A trigger can be defined once and then used by any application that accesses the table on which it is defined.
- Easier maintenance—If a business policy changes, only a change to the corresponding triggers is needed, instead of changes to each application program.

The following report options are available for the trigger (TG) object type:

**L (Trigger List Report)**

Displays the creator, associated schema, associated table, time, and event grouped by a specific trigger. This report is useful when you need detailed information about a specific trigger and its associated schemas and tables.

**TX (Trigger Text Report)**

Displays the full text of the CREATE TRIGGER statement.
Roles and trusted context support (GRANT and REVOKE privileges) is provided for the following objects:

- Collection IDs
- Databases
- Functions
- Packages
- Plans
- Schemas
- Sequences
- Tables
- Views
- Distinct types
- Buffer pools
- Storage groups
- Tablespaces

Associating privileges with trusted contexts and roles helps improve overall security by controlling when privileges are made available, based on the trusted connections.

CA RC/Query provides drop impact and user authorization reports for roles.

RC/Query's DB2 Trusted Context reports display information on Trusted Context objects.

A Trusted Context is a database security object that enables the establishment of a trusted relationship between a DB2 database management system and an external entity.
The following trusted context reports are provided:

**L (Trusted Context List Report)**

Provides basic information about each role that matches your selection criteria. This report provides the Database Administrator with a report that lists information such as:

- The user-defined name of the trusted context.
- The authorization ID or role that defined the trusted context.
- The DB2 primary authorization ID that is used to establish the connection.
- The name of the trusted context default role.

**D (Trusted Context Detail Report)**

Provides a detailed report on a specific trusted context.

**UA (Trusted context User Authorization Report)**

Displays the authorization IDs with which the trusted context can be used.

### Distinct Type Reports

A *distinct type* is a user defined data type that shares its internal representation with a built-in data type. The built-in data type is the source type. The name of a distinct type is qualified with a schema name. A distinct type is subject to the same restrictions as its source type.

Distinct type is a separate and incompatible data type because a distinct type does not automatically inherit the functions and operations of its source type.

Only the functions and operators explicitly defined on a distinct type can be applied to that distinct type.

Distinct type reports display cross-reference information about all user-defined data types.
The following report options are available for the distinct type (DT) object type:

**Note:** To jump to another report, use the Qualifier field on the table panels. The Grantor field is inactive, except for selecting the grantor of the permission for the table authorization reports: Table User Authorization, Table Plan Authorization, and Table Package Authorization. The Creator field is used to select the creator of the table. Use line commands to select other reports.

L (Distinct Type List Report)

Lists basic information about distinct types and their associated schemas. For example, source type, and owner of a certain distinct type. You can specify a single distinct type name or a search condition to use for retrieving multiple objects. SQL is accepted.

In the DISTINCT TYPE field, you can specify a single distinct type name or a search condition to use for retrieving multiple objects. This field will accept SQL selection criteria. If the field is left blank, * (all) is the default.

D (Distinct Type Detail Report)

Provides detailed information about a specific distinct type and its schema.

C (Distinct Type Column report)

Provides information about a specific distinct type used and defined in columns. The report displays the distinct type with its schema and then references the column name.

UA (Distinct Type User Authorization report)

Provides information about all user authorizations granted to distinct types. This report displays the distinct type followed by grantee, grantor, schema, and authorization levels.
Chapter 6: Batch Reporting

This section contains the following topics:

How to Generate Reports in Batch Mode (see page 117)
Batch Report Selection Panel (see page 118)
Batch Request Submission (see page 124)

How to Generate Reports in Batch Mode

You can generate reports in batch mode using the BR (batch reporting) command. Batch reporting creates a data set that contains the JCL commands and control information necessary to generate and print the reports. Some of the advantages of Batch reporting include:

■ Availability of Reports—All reports available through online mode are available through batch reporting.

  Note: To be available in batch, a report must have a row in the report description table (PTI.PTRCQ_DESC_#). This table is loaded during the post-installation processing for each release of CA RC/Query.

■ Customized Reports—You can use the Extended Query Facility (EQF) to generate the same customized reports you generate in online mode.

■ More Efficient Processing—Because the reports are generated in batch, they do not require a user’s time to display and print. Additionally, multiple reports can be created at the same time.

Do not confuse the batch reporting facility with the Batch Processor, which is documented separately in the Batch Processor Reference Guide. The Batch Processor processes data sets that contain SQL and special PBP commands. The data sets are created with CA RC/Migrator and CA RC/Update. PBP commands let you dynamically call DB2 utilities and application programs, execute DB2 commands (DSN), perform VSAM functions, and so on.

The load libraries necessary for the batch execution STEPLIB DD are specified through the Global Profile Menu.
Follow these steps:

1. Type BR on the command line and press Enter.
   The Batch Specification panel appears. Use this panel for specifying the data set you want to use for batch reporting.

2. Complete the following fields:
   - ISPF library or other partitioned or sequential data set options. You can enter a partitioned data set (PDS) or a sequential file name.
   - Data set options like the data set disposition and whether to replace existing members in a PDS.
   - Enter a valid JOB statement.

   Press Enter.
   The specified data set is allocated and opened. The Batch Report Selection panel appears with a message indicating that the data set is allocated and its share rule. When the panel first appears, no report options are listed. Enter the DB2 object and option information, and optional EQF selection criteria to receive a list of report options.

3. Select the reports that you want to generate.
   You can re-enter selection information to display a new selection list; your previous selections are saved in a queue. You can then select more report options. This process can be repeated until all report requests have been made.

   Enter information in these fields and press Enter to display a list of available report options.

   Enter Report Selection Criteria (spaces for EQF Selection suppress EQFs).

**Batch Report Selection Panel**

You can use the Batch Report Selection panel to select the reports you want to generate. When the panel first appears, no report options are listed. You enter DB2 Object and Option information and (optionally) EQF selection information to receive a list of report options.

After the list appears, you can select the reports you want to generate. You can re-enter selection information to display a new selection list; your previous selections are saved in a queue. You can then select more report options. This process can be repeated until all report requests have been made.

**Note:** For information about the fields, press F1 (Help).

Enter information in these fields and press Enter to display a list of available report options.
Report Option Display

The Report Option Display lists all report options and extended queries that match the information you entered in the control area.

Note the following descriptions of fields on the screen:

**REPORT/QUERY**

Name of report or (indented) extended query. Reports are listed alphabetically, by object and then by report. Extended queries are listed under the related report. Extended queries are displayed as `creator.queryname`. To display extended queries, a value must be entered in the EQF Name field.

**DESCRIPTION**

A short description of the report or query. For extended queries, the text shown here is the text entered in the description field of the EQF when the extended query was created.

The following four columns, Item Name, Creator, Qualifier, and Grantor, accept the same information as the header fields of the same name when you generate each report online.

**Note:** If you are not sure how these fields are used when generating a particular report, see the “Introduction” chapter for more information, or press F1 (Help).

Select Report Options

You can select report options.

**Follow these steps:**

1. Enter $ next to the report/query name.
   
   The cursor moves to the Item Name field.

2. (Optional) Enter information in the Item Name, Creator, Qualifier, or Grantor fields to limit the items in any report, depending on which of these fields are active.
Report selections can be divided into three levels as shown in the following sample:

```
ROBRS  ------------ RC/Q Batch Report Selection ----------
COMMAND ===>                        SCROLL ===> PAGE

Enter Report Selection Criteria (spaces for EQF Selection suppress EQFs)
Rpt. Selection: DB2 Object => T   Option => *   Where => N
EQF Selection: EQF Name => *   > Creator => TDCATS   >
Loc: LOCAL  --------- SSID: DxxB  ---------USER02  --

Enter 'S' to select the report(s) you wish to execute in batch.

REPORT/QUERY       DESCRIPTION                          ITEM NAME       CREATOR
   DATABASE (DB)  INFORMATION ON DATABASES             __________________    ________
   DETAIL (D)     DETAIL INFO. ABOUT DATABASES          __________________    ________
   DROP IMP (DI)  DROP IMPACT FOR DATABASES             ______    _____________
   DISPLAY (DS)   DISPLAY STATUS OF DATABASES           __________________    ________
$ INDEXES (I)    INDEXES WITHIN DATABASES              __________________    ________
   LIST (L)       LIST AVAILABLE DATABASES              __________________    ________
   LISTCAT (LC)   LISTCAT INFO. FOR DATABASES           __________________    ________
   OBJDEP (O)     DEP OBJS STARTING AT DATABASES        __________________    ________
   PLAN (P)       PLANS THAT REF. DATABASES              __________________    ________
$ TABLE (T)      LIST TABLES WITHIN DATABASES           __________________    ________
$ ABCDE.
   COLS10       TABLES WITH < 10 COLUMNS               __________________    ________
   TBLSPACE (TS) TBLSPACES WITHIN DATABASES             __________________    ________
   USERAUTH (UA) AUTH. HELD BY USER ON DB'S             __________________    ________
```
The following describes the report levels:

**DATABASE (LEVEL 1)**

Level 1 is the DB2 object (here, Database). When you select the DB2 object, you are requesting all the different reports for that DB2 object (in this case the level two report names follow the object name). Selecting Database would select all the Database reports, such as Database Detail, Database Drop Impact, and Database Display. If you also want level three reports (extended queries, as described in the following), you must specifically select each one you want.

If you select level-one (the DB2 object) and complete the Item Name, Qualifier, or Grantor fields next to the DB2 object, the information you enter will be used to limit all the reports for that object. In the previous example, if you enter DSN% in the Item Name field next to Database and select only Database with an $, all the different Database reports (but not the extended queries) will be generated, and only the databases starting with DSN will be included in the reports.

**DETAIL, DROP IMP, DISPLAY, .... (LEVEL 2)**

Consists of the different reports for the DB2 object, the same reports that you can select online using the DB2 Object and report Option prompts. Database Detail, Database Drop Impact, and Database Display are some of the level-two reports for the Database object.

If you select a level one report and also select a level two report for the same object, two level two reports are generated. For example, if you selected Database Reports and the Database Detail Report, two Database Detail Reports would be generated.

**TDLKA.COLS10 (LEVEL 3)**

Consists of extended queries. TDLKA.COLS10 is a level 3 report.

**Note:** You can select all displayed level 2 and level 3 reports by entering the ALL command in the command line. The ALL command does not select level one reports so duplicate reports are not generated. Level 3 reports that use runtime variables in the EQF cannot be selected for batch reporting. These reports have an ampersand (&) character located directly to the left of the report.

After you have selected the reports you want to generate, press Enter. The selected items are queued. You can view this queue by using the S (SHRINK) command.

You can select the same report option more than once and enter different Item Name, Creator, Qualifier, or Grantor information each time to create different reports. Specify the information and press Enter.
Processing Reports

When you have selected the reports you want to generate and they have been queued, you have five options:

- Continue to make additional report selections.
- Enter new selection criteria to receive a new list of reports.
- Press F3 (End) to write the batch report requests to the specified data set and to close the data set. The Batch Request Submission screen is then displayed. (If you press F3 (End) without selecting reports, you are returned to the screen from which you entered the BR command.)
- Enter CANCEL to cancel the batch report request and return to the screen from which you issued the BR command.
- Enter S (Shrink) to view the current list of selected reports.

Displaying the Report Selection Queue

Every time you make report selections from the Batch Report Selection panel and press Enter, the reports are placed into a queue and the following message appears:

SELECTED REPORTS HAVE BEEN QUEUED, ENTER S (SHRINK) TO VIEW QUEUE.

The S (SHRINK) command acts as a toggle between the selection screen and the current queue. While the selection screen appears, you can continue to enter new selection criteria and select reports. All selected reports are placed into the queue.

The report queue permits you to enter new selection criteria in the header to display a new list of reports without affecting your current selections. Whenever you select reports and press Enter, they are placed into the queue.
**View Your Selections**

You can view your selections.

**Follow these steps:**

1. Enter the S (SHRINK) command in the command line field.

   A Report Selection Queue screen appears, listing all reports currently selected.

2. (Optional) Remove reports from the list by blanking out the S next to the name. To return to the selection screen, re-enter the S (SHRINK) command in the command line field.

   If you enter S (SHRINK) again, you return to the selection screen where you can make more selections or change the selection criteria.

To return to the report screen with your selections, press F3 (End). To view the reports in the current queue, enter the S (SHRINK) toggle to limit the reports displayed to only those selected.

**Creating New Report Options**

You can create queries to customize batch reports just as you customize reports generated online, using EQF. You must create the extended query while using CA RC/Query online. However, after you create the extended query, you can use it for batch reporting.

To create a query for use with batch reporting, select the DB2 Object and Option for the report you want. When the report appears, you can use EQF to create an extended query that can be stored and used in batch mode. You can also specify the DB2 Object and Option for the report you want and specify Y (Yes) in the Where prompt to access EQF without first displaying the report.

For example, enter T in the DB2 Object prompt and L in the Option prompt to select the Table List Option. When the tables are listed, enter Y in the Where prompt to access EQF. You can also enter Y in the Where prompt when you enter the DB2 Object and Option information. The report will not display until you access EQF.
You can then create an extended query to make the report more specific. For instance, you can add the statement `AND A.COLCOUNT > 100` to list tables with more than 100 columns. You could enter `100COLS` for the name and enter `Tables w 100 cols` for the description. After you store this extended query, you can access it for batch processing by entering `100COLS` in the EQF Name field. (You could also enter an asterisk (*) to display all EQFs.) This would let you get a Table List report for all tables with more than 100 columns. Optionally, you could then enter information in the Item Name and Creator fields to make the report even more tailored.

**Note:** For more information about the Extended Query Facility, see the *CA Database Management Solutions for DB2 for z/OS General Facilities Reference Guide*.

### Batch Report Generation Example

The following is an example of how to use the batch report facility to generate a report to find authorizations held by a specific set of users.

**Follow these steps:**

1. Enter `BR` in the command line of the Main Menu.
   - The Batch Specification screen appears.
2. Enter the output JCL data set and relevant parameters.
   - The Batch Report Selection panel appears.
3. Enter print and output parms.
4. Enter `U` in the DB2 Object field.
5. Enter `S` in the selection column next to the report to select it, then enter the first user ID in the item line.
6. Select the same report again and enter the second user ID in the item line, then press Enter.
7. Repeat this procedure for every user ID that you would like added to the report.

### Batch Request Submission

The Batch Request Submission panel appears before the report request is submitted for execution. You can submit the job or cancel the request. If you cancel the request, the data set is saved but not submitted for execution. You can execute it later by using the TSO SUBMIT command.

**Note:** You might want to schedule report execution for nighttime or other off-peak hours.
Appendix A: Sample Extended Queries

This section contains the following topics:

How to Populate EQF Tables with Sample Extended Queries (see page 125)  
EQF Samples (see page 126)

How to Populate EQF Tables with Sample Extended Queries

A partitioned data set (PDS) member has been included to let you populate the Extended Query Facility (EQF) tables with some sample extended queries. The sample extended queries demonstrate the power and flexibility of EQF and provide meaningful additions to the reports.

EQF lets you extend an existing, internal query to include additional WHERE and ORDER BY clauses. The queries you extend are internal queries used by our products to produce reports or selection lists. EQF lets you control the rows selected, but not the content (columns).

Note: For more information about EQF, see the General Facilities Reference Guide.

You can install the sample extended queries at any time after CA RC/Query has been installed.

To install, execute member hlq.CDBASRC(RCQSQL), where hlq is the high level qualifier used during product installation.

All sample queries are created by CA Technologies and have a Share option of Y. If you would like to change the Creator or Share options, edit member RCQSQL before executing it.
To execute a sample extended query:

1. Enter the appropriate CA RC/Query DB2 Object and Option codes in the header fields.
2. Enter the appropriate Item or Creator selection criteria, or both.
3. For the Where field, enter $ for the first prompt and the extended query name for the second prompt. Alternatively, enter $ for the first prompt, leave the EQF name field blank, and select the EQF from a list.

**EQF Samples**

The following reports have sample extended queries provided:

**Note:** The DB2 object and report option are shown in parentheses after the report name. The DATABASE extended queries use the replaceable parm feature of EQF to prompt for the database name.

**Column Index Report (C,I)**

**Column Index Report (C, I)**

**DATABASE**

Displays the indexes that reference a particular column name within a database.

**Column Table Report (C, T):**

**DATABASE**

Displays tables and views that reference a particular column name within a database.

**SHRTVKAR**

Displays the columns that are VARCHAR or LONG VARCHAR with a length less than 20 characters. Use this extended query to determine the columns that should be defined as CHAR.
Index List Report (I, L):

**BIGSUBPG**
Displays indexes that have a subpage size of 2048 or larger. Use this extended query to determine the indexes that use full or half subpage sizes.

**CLOSERUL**
Displays indexes that have a close rule of YES. Use this extended query to determine the indexes that DB2 will open and close for each access.

**DATABASE**
Displays selected indexes within a database.

**LEAFGT02**
Displays indexes that have leaf pages greater than 2 pages away from each other. Use this extended query to determine the indexes that should be reorganized to minimize response time for index scans.

**LEVEL3**
Displays indexes that have more than 3 levels. Use this extended query to determine the indexes that have too many indexes to be efficient.

**NOCLUST**
Displays all indexes defined as clustering, but whose table data is not in clustered order. These index should be reorganized. (If you first create a non-clustering index, and later create a clustering index on the same table, DB2 identifies it as the clustering index but does not arrange the data already in the table. The data is still ordered by the first index. When the tablespace is reorganized by the IBM REORG utility, DB2 clusters the data in accordance with the new clustering index.)

**NORUNST**
Displays indexes that have no RUNSTATS statistics. Use this extended query to determine the indexes on which RUNSTATS needs to be run.

**UNC10PCT**
Displays clustering indexes that are 10 percent unclustered. Use this extended query to determine the clustering indexes that might have performance problems due to being unclustered.

**UNC05PCT**
Displays clustering indexes that are 5 percent unclustered. Use this extended query to determine the clustering indexes that might have performance problems due to being unclustered.
Plan Dependency Report (P, P)

**INDXDEP**
Displays all plans that are dependent on an index. Use this extended query to determine:
- Whether an index is being used.
- The effect the dropping of an index will have on a plan.

Uses the replaceable parm feature of EQF to prompt for the database name.

**SNYDEP**
Displays plans that are dependent on a synonym. Use this extended query to determine the effect the dropping of a synonym will have on plans. Uses the replaceable parm feature of EQF to prompt for the synonym name.

**TBLDEP**
Displays all plans that are dependent on a table. Use this extended query to determine the effect the dropping of a table will have on plans. Uses the replaceable parm feature of EQF to prompt for the index or table name.

**VIEWDEP**
Displays plans that are dependent on a view. Use this extended query to determine the effect the dropping of a view will have on plans. Uses the replaceable parm feature of EQF to prompt for the view name.

Plan List Report (P, L)

**INVALID**
Lists all invalid DB2 plans. These plans have been marked as invalid by DB2 and must be examined and rebound before they can be executed.

**REPEAT**
Displays plans that are bound as repeatable read. Use this extended query to determine the plans that could cause locking contention with repeatable read isolation.

**RUNTIME**
Displays plans that defer their validity checking until execution time. Use this extended query to determine the plans that require extra processing time to validate DB2 objects at execution time.

**UNCLUSTR**
Displays plans that are using one or more indexes that are out of clustering order. Use this extended query to determine the plans that might have performance problems due to an inefficient clustering index.

**VALID**
Lists all valid DB2 plans.
RI - Check Pending/Tables Report (RI, T)  
DATABASE  
Displays selected tables in Tables check-pending status in a database.

RI - Check Pending Tablespaces Report (RI, TS)  
DATABASE  
Displays selected tablespaces in check pending status in a database.

RI - Child Relationship Report (RI,C)  
DATABASE  
Displays referential integrity rules for Relationship the selected child tables within a database.

RI - Foreign Key Report (RI, FK)  
DATABASE  
Displays column information for Columns the foreign key columns of the selected child tables within a database.

RI - Primary Key Report (RI, PK)  
DATABASE  
Displays column information for columns the primary keys of the selected parent tables within a database.

RI - Spaceset Inquiry Report (RI, SS)  
DATABASE  
Displays selected tablespace sets in a database.

Synonym Table Report (S, T)  
DATABASE  
Displays selected synonyms and their corresponding tables in a database.

Synonym View Report (S, V)  
DATABASE  
Displays selected synonyms and their corresponding views in a database.

System List Report (SY, L)  
ICNEEDED  
Displays the tablespaces that need an image copy after a LOAD or REORG with the LOG(NO) option. Use this information for determining which tablespaces are unavailable until an image copy is run or the -START DATABASE command is issued with ACCESS(FORCE).
Table Index Report (T, I)

MULTINDX
Displays the tables that have multiple indexes. Use this extended query for determining the tables that have multiple indexes that are defined.

SMALLIDX
Displays the tables that have small indexes. Use this extended query for determining the tables that are not large enough to warrant an index.

Table List Report (T, L)

DATABASE
Displays selected tables in a database.

LESS32
Displays the tables that have a record length less than or equal to 32. Use this extended query for determining the tables that waste space when the maximum number of rows are placed onto a page.

MULTINDX
Displays the tables that have multiple indexes. Use this extended query for determining the tables that have multiple indexes that are defined.

NOINDEX
Displays all tables that do not have an index. Use this extended query for highlighting tables with potential performance problems.

Note: This extended query uses a subquery for determining which tables do not have indexes. This extended query illustrates the remarkable sophistication that EQFs provide in solving difficult reporting problems.

SMALLIDX
Displays the tables that have small indexes. Use this extended query for determining the tables that are not large enough to warrant an index.

Tablespace Detail Report (TS, D)

DROPPED
Displays the tablespaces with dropped tables. To regain the dropped space, reorganize the tablespace.

OVERFLOW
Displays the tablespaces that have relocated rows (overflow rows) > 10 percent of total rows. Reorganize these tablespaces.
Tablespace List Report (TS, L)

CLOSERUL
Displays the tablespaces with a close rule of YES. Use this extended query for determining the tablespaces that DB2 opens and closes for each access.

DATABASE
Displays selected tablespaces in a database.

LITTLEUS
Displays the tablespaces that have less than 80 percent used space. Use this extended query for determining whether the tablespaces have too much space allocated.

MULTITAB
Displays the tablespaces that have multiple tables. Use this extended query for determining the tablespaces that have more than one table, where each table uses more than five tablespace pages.

NORUNST
Displays the tablespaces that have no RUNSTATS statistics. Use this extended query for determining the tablespaces on which to run RUNSTATS.

TSLOCKS
Displays the tablespaces that have a locking rule of ANY or TABLESPACE. Use this extended query for determining the tablespaces that have a higher probability of causing a tablespace lock.

TS32K
Displays the 32-KB tablespaces. Use this extended query for determining the tablespaces not using the 4-KB page size.

View List Report (V, L)

DATABASE
Displays selected views within a database.
Appendix B: User Exits

This section contains the following topics:

Overview of User Exits (see page 133)
User Exit Parameters (see page 133)

Overview of User Exits

The following user exits located in hlq.CDBASRC control the display of reports according to site-defined specifications:

RQAUSRX1

Adds your own processing to restrict the generation of unauthorized report requests. For example, you could restrict specific users from displaying a Plan Statement report unless a mask is specified for the plan name. You can also choose to issue a message regarding the report request.

RQAUSRX2

Prevents the generation of duplicate reports. A message is issued noting that a duplicate report was not generated. You can change the message text to suit your installation, but no other changes are required. You need only to assemble and link-edit this user exit to include it with your processing.

In the user exits, you can evaluate the report request using the parameters that are passed, and then set a return code and optionally format a message to be displayed to the user.

User Exit Parameters

The user exits enable CA RC/Query to pass parameters to you. You can use the parameters to determine whether certain reports are displayed for certain users under given conditions.

The parameters include the header fields, primary and secondary authorizations, subsystem ID, subsystem location, ACM specification, and batch or online processing. The parameter area DSECT is contained in high-level.CDBASRC(RQMUSRXT).
The parameters adhere to the following format:

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Format/Length</th>
<th>Comment</th>
</tr>
</thead>
</table>

For example, for the CREATOR field, you would see the following:

PARM_CREATOR   DS   CL08   CREATOR

**Preparing the User Exits**

To use the user exits, you must use `high-level.CDBASRC(LNKRQUSR)` as the JCL to assemble and link-edit the user exit. You will need to add the necessary job information and values for the symbolic parameters before you execute it.
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