

DB2 for OS/390
Version 5



Command Reference

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page v.

First Edition (June 1997)

This edition applies to Version 5 of IBM DATABASE 2 Server for OS/390 (DB2 for OS/390), 5655-DB2, and to any subsequent releases until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

The technical changes for this edition are summarized under “Summary of Changes to this Book” in the Introduction. Specific changes are indicated by a vertical bar to the left of a change. A vertical bar to the left of a figure caption indicates that the figure has changed. Editorial changes that have no technical significance are not noted.

This softcopy version is based on the printed version of the book, and includes the changes indicated in the printed version by vertical bars. Additional changes made to this softcopy version of the manual since the hardcopy manual was published are indicated by the hash (#) symbol in the left-hand margin.

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Contents

Notices	v
Programming Interface Information	v
Trademarks	vi
Chapter 1. Introduction	1
Who Should Read This Book	1
How To Use This Book	1
How to Read the Syntax Diagrams	1
How to Use the DB2 Library	3
How to Obtain DB2 Information	5
Summary of Changes to DB2 for OS/390 Version 5	6
Summary of Changes to This Book	13
Naming Conventions	14
Privileges and Authorization IDs	17
The Bind Process	18
Chapter 2. Commands	21
DB2 Command Parsing	21
Scope of Commands	23
Extended MCS Consoles	24
Output from DB2 Commands	24
DSN Subcommand Parsing	24
Description of Commands	25
-ALTER BUFFERPOOL (DB2)	29
-ALTER GROUPBUFFERPOOL (DB2)	34
-ALTER UTILITY (DB2)	37
-ARCHIVE LOG (DB2)	40
BIND PACKAGE (DSN)	46
BIND PLAN (DSN)	51
Options of BIND and REBIND for PLAN and PACKAGE	56
-CANCEL THREAD (DB2)	81
/CHANGE (IMS)	85
DCLGEN (DECLARATIONS GENERATOR) (DSN)	87
/DISPLAY (IMS)	95
-DISPLAY ARCHIVE (DB2)	98
-DISPLAY BUFFERPOOL (DB2)	100
-DISPLAY DATABASE (DB2)	108
-DISPLAY GROUP (DB2)	119
-DISPLAY GROUPBUFFERPOOL (DB2)	123
-DISPLAY LOCATION (DB2)	134
-DISPLAY PROCEDURE (DB2)	138
-DISPLAY RLIMIT (DB2)	141
-DISPLAY THREAD (DB2)	142
-DISPLAY TRACE (DB2)	154
-DISPLAY UTILITY (DB2)	159
DSN (TSO)	163
DSNC (CICS Attachment Facility)	166
DSNC DISCONNECT (CICS Attachment Facility)	167
DSNC DISPLAY (CICS Attachment Facility)	169
DSNC MODIFY (CICS Attachment Facility)	173

DSNC STOP (CICS attachment facility)	175
DSNC STRT (CICS attachment facility)	176
DSNH (TSO CLIST)	178
END (DSN)	203
FREE PACKAGE (DSN)	204
FREE PLAN (DSN)	207
MODIFY irlmproc,ABEND (MVS IRLM)	209
MODIFY irlmproc,DIAG,DELAY (MVS IRLM)	211
MODIFY irlmproc,SET (MVS IRLM)	213
MODIFY irlmproc,STATUS (MVS IRLM)	215
-MODIFY TRACE (DB2)	221
REBIND PACKAGE (DSN)	224
REBIND PLAN (DSN)	227
-RECOVER BSDS (DB2)	231
-RECOVER INDOUBT (DB2)	232
-RESET GENERICLU (DB2)	235
-RESET INDOUBT (DB2)	237
RUN (DSN)	240
-SET ARCHIVE (DB2)	243
SPUFI (DSN)	246
/SSR (IMS)	247
/START (IMS)	248
-START DATABASE (DB2)	249
-START DB2 (DB2)	255
-START DDF (DB2)	258
START irlmproc (MVS IRLM)	259
-START PROCEDURE (DB2)	263
-START RLIMIT (DB2)	266
-START TRACE (DB2)	268
/STOP (IMS)	278
-STOP DATABASE (DB2)	279
-STOP DB2 (DB2)	284
-STOP DDF (DB2)	286
STOP irlmproc (MVS IRLM)	288
-STOP PROCEDURE (DB2)	290
-STOP RLIMIT (DB2)	293
-STOP TRACE (DB2)	294
-TERM UTILITY (DB2)	299
/TRACE (IMS)	302
TRACE CT (MVS IRLM)	304
Glossary	307
Bibliography	323
Index	329

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Programming Interface Information

This book is intended to help you to use commands of IBM DATABASE 2 Server for OS/390 (DB2 for OS/390) and related subsystems. This book primarily documents General-use Programming Interface and Associated Guidance Information provided by DB2.

General-use programming interfaces allow the customer to write programs that obtain the services of DB2.

However, this book also documents Product-sensitive Programming Interface and Associated Guidance Information.

Product-sensitive programming interfaces allow the customer installation to perform tasks such as diagnosing, modifying, monitoring, repairing, tailoring, or tuning of this IBM software product. Use of such interfaces creates dependencies on the

Chapter 1. Introduction

This chapter contains specific information about this book, a general overview of the library for DB2 for OS/390, a summary of changes to DB2, and a description of naming conventions, privileges, authorization IDs and the bind process.

Who Should Read This Book

This book presents reference information for the tasks of system administration, database administration, and operation. It presents detailed information on commands, including syntax, option descriptions, and examples for each command.

How To Use This Book

This book is intended to serve as a reference. It is assumed that you understand system administration, database administration, or application programming in the DB2 environment, and that you have some knowledge of the following:

- CICS, IMS, or TSO
- A programming language (Assembler language, PL/I, COBOL, APL2, BASIC, FORTRAN, PROLOG, or C)
- MVS Job Control Language (JCL)
- Structured Query Language (SQL)

Contents

This book contains the following parts:

“Chapter 1. Introduction” describes:

- How to use both this book and the DB2 library
- Changes for both DB2 and this book
- Naming conventions, privileges, and authorization IDs
- The bind process

“Chapter 2. Commands” on page 21 contains:

- Rules for parsing DSN and DB2 commands
- Tables listing commands by category, a brief description of their functions, and references to descriptions later in the section
- Descriptions of each command, listed in alphabetical order

How to Read the Syntax Diagrams

The following rules apply to the syntax diagrams used in this book:

- Read the syntax diagrams from left to right, from top to bottom, following the path of the line.

The ►— symbol indicates the beginning of a statement.

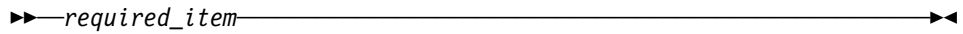
The —> symbol indicates that the statement syntax is continued on the next line.

The ►— symbol indicates that a statement is continued from the previous line.

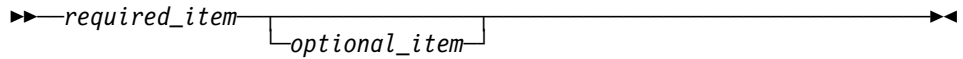
The $\longrightarrow\blacktriangleleft$ symbol indicates the end of a statement.

Diagrams of syntactical units other than complete statements start with the $\blacktriangleright\longrightarrow$ symbol and end with the \longrightarrow symbol.

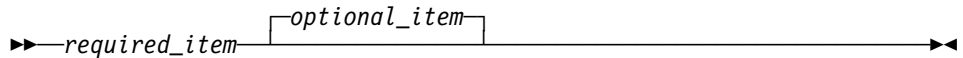
- Required items appear on the horizontal line (the main path).



- Optional items appear below the main path.

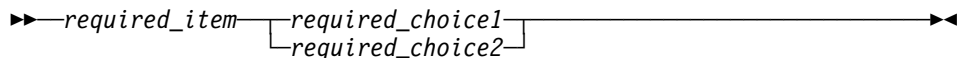


If an optional item appears above the main path, that item has no effect on the execution of the statement and is used only for readability.

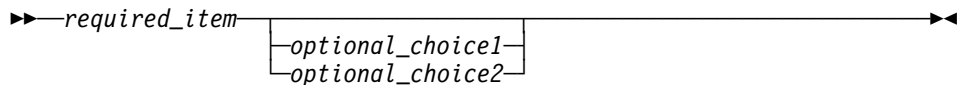


- If you can choose from two or more items, they appear vertically, in a stack.

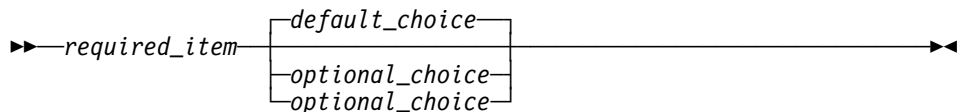
If you *must* choose one of the items, one item of the stack appears on the main path.



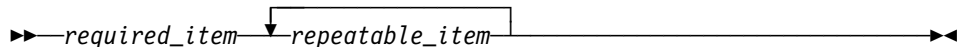
If choosing one of the items is optional, the entire stack appears below the main path.



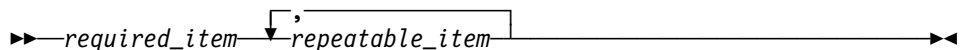
If one of the items is the default, it appears above the main path and the remaining choices are shown below.



- An arrow returning to the left, above the main line, indicates an item that can be repeated.



If the repeat arrow contains a comma, you must separate repeated items with a comma.



A repeat arrow above a stack indicates that you can repeat the items in the stack.

- Keywords appear in uppercase (for example, FROM). They must be spelled exactly as shown. Variables appear in all lowercase letters (for example, *column-name*). They represent user-supplied names or values.

- If punctuation marks, parentheses, arithmetic operators, or other such symbols are shown, you must enter them as part of the syntax.

How to Use the DB2 Library

Titles of books in the library begin with DB2 for OS/390 Version 5. However, references from one book in the library to another are shortened and do not include the product name, version, and release. Instead, they point directly to the section that holds the information. For a complete list of books in the library, and the sections in each book, see the bibliography at the back of this book.

Throughout the library, the DB2 for OS/390 licensed program and a particular DB2 for MVS/ESA subsystem are each referred to as “DB2.” In each case, the context makes the meaning clear.

The most rewarding task associated with a database management system is asking questions of it and getting answers, the task called *end use*. Other tasks are also necessary—defining the parameters of the system, putting the data in place, and so on. The tasks associated with DB2 are grouped into the following major categories (but supplemental information relating to all of the below tasks for new releases of DB2 can be found in *Release Guide*):

Installation: If you are involved with DB2 only to install the system, *Installation Guide* might be all you need.

If you will be using data sharing then you also need *Data Sharing: Planning and Administration*, which describes installation considerations for data sharing.

End use: End users issue SQL statements to retrieve data. They can also insert, update, or delete data, with SQL statements. They might need an introduction to SQL, detailed instructions for using SPUFI, and an alphabetized reference to the types of SQL statements. This information is found in *Application Programming and SQL Guide* and *SQL Reference*.

End users can also issue SQL statements through the Query Management Facility (QMF) or some other program, and the library for that program might provide all the instruction or reference material they need. For a list of some of the titles in the QMF library, see the bibliography at the end of this book.

Application Programming: Some users access DB2 without knowing it, using programs that contain SQL statements. DB2 application programmers write those programs. Because they write SQL statements, they need *Application Programming and SQL Guide*, *SQL Reference*, and *Call Level Interface Guide and Reference* just as end users do.

Application programmers also need instructions on many other topics:

- How to transfer data between DB2 and a host program—written in COBOL, C, or FORTRAN, for example
- How to prepare to compile a program that embeds SQL statements
- How to process data from two systems simultaneously, say DB2 and IMS or DB2 and CICS
- How to write distributed applications across platforms

- How to write applications that use DB2 Call Level Interface to access DB2 servers
- How to write applications that use Open Database Connectivity (ODBC) to access DB2 servers
- How to write applications in the Java programming language to access DB2 servers

The material needed for writing a host program containing SQL is in *Application Programming and SQL Guide* and *Application Programming Guide and Reference for Java*. The material needed for writing applications that use DB2 Call Level Interface or ODBC to access DB2 servers is in *Call Level Interface Guide and Reference*.

For handling errors, see *Messages and Codes*.

Information about writing applications across platforms can be found in *Distributed Relational Database Architecture: Application Programming Guide*.

System and Database Administration: *Administration* covers almost everything else. *Administration Guide* divides those tasks among the following sections:

- Section 2 (Volume 1) of *Administration Guide* discusses the decisions that must be made when designing a database and tells how to bring the design into being by creating DB2 objects, loading data, and adjusting to changes.
- Section 3 (Volume 1) of *Administration Guide* describes ways of controlling access to the DB2 system and to data within DB2, to audit aspects of DB2 usage, and to answer other security and auditing concerns.
- Section 4 (Volume 1) of *Administration Guide* describes the steps in normal day-to-day operation and discusses the steps one should take to prepare for recovery in the event of some failure.
- Section 5 (Volume 2) of *Administration Guide* explains how to monitor the performance of the DB2 system and its parts. It also lists things that can be done to make some parts run faster.

In addition, the appendixes in *Administration Guide* contain valuable information on DB2 sample tables, National Language Support (NLS), writing exit routines, interpreting DB2 trace output, and character conversion for distributed data.

If you are involved with DB2 only to design the database, or plan operational procedures, you need *Administration Guide*. If you also want to carry out your own plans by creating DB2 objects, granting privileges, running utility jobs, and so on, then you also need:

- *SQL Reference*, which describes the SQL statements you use to create, alter, and drop objects and grant and revoke privileges
- *Utility Guide and Reference*, which explains how to run utilities
- *Command Reference*, which explains how to run commands

If you will be using data sharing, then you need *Data Sharing: Planning and Administration*, which describes how to plan for and implement data sharing.

Additional information about system and database administration can be found in *Messages and Codes*, which lists messages and codes issued by DB2, with explanations and suggested responses.

Diagnosis: Diagnosticians detect and describe errors in the DB2 program. They might also recommend or apply a remedy. The documentation for this task is in *Diagnosis Guide and Reference* and *Messages and Codes*.

How to Obtain DB2 Information

DB2 on the Web

Stay current with the latest information about DB2. View the DB2 home page on the World Wide Web. News items keep you informed about the latest enhancements to the product. Product announcements, press releases, fact sheets, and technical articles help you plan your database management strategy. Technical professionals can access DB2 publications on the Web and follow links to other Web sites with more information about DB2 family and OS/390 solutions. Access DB2 on the Web with the following URL:

<http://www.ibm.com/software/db2os390>

DB2 Publications

The DB2 publications are available in both hardcopy and softcopy format. Using online books on CD-ROM, you can read, search across books, print portions of the text, and make notes in these BookManager books. With the appropriate BookManager READ product or IBM Library Readers, you can view these books on the MVS, VM, OS/2, DOS, AIX and Windows platforms.

When you order DB2 Version 5, you are entitled to one copy of the following CD-ROM, which contains the DB2 licensed book for no additional charge:

DB2 Server for OS/390 Version 5 Licensed Online Book, LK2T-9075.

You can order multiple copies for an additional charge by specifying feature code 8207.

When you order DB2 Version 5, you are entitled to one copy of the following CD-ROM, which contains the DB2 and DATABASE 2 Performance Monitor online books for no additional charge:

DB2 Server for OS/390 Version 5 Online Library, SK2T-9092

You can order multiple copies for an additional charge through IBM's publication ordering service.

Periodic updates will be provided on the following collection kit available to licensees of DB2 Version 5:

IBM Online Library Transaction Processing and Data Collection, SK2T-0730

SK2T-9092 will be superseded by SK2T-0730 when updates to the online library are available.

In some countries, including the United States and Canada, you receive one copy of the collection kit at no additional charge when you order DB2 Version 5. You will

automatically receive one copy of the collection kit each time it is updated, for no additional charge. To order multiple copies of SK2T-0730 for an additional charge, see “How to Order the DB2 Library” on page 6. In other countries, updates will be available in displayable softcopy format in the IBM Online Book Library Offering (5636–PUB), SK2T-0730 IBM Online Library Transaction Processing and Data Collection at a later date.

See your IBM representative for assistance in ordering the collection.

DB2 Server for OS/390 books are also available for an additional charge on the following collection kits, which contain online books for many IBM products:

IBM Online Library MVS Collection, SK2T-0710, in English

Online Library Omnibus Edition OS/390 Collection, SK2T-6700, in English

IBM Online Library MVS Collection Kit, SK88-8002, in Japanese, for viewing on DOS and Windows platforms

How to Order the DB2 Library

You can order DB2 publications and CD-ROMs through your IBM representative or the IBM branch office serving your locality. If you are located within the United States or Canada, you can place your order by calling one of the toll-free numbers :

- In the U.S., call 1-800-879-2755.
- In Canada, call 1-800-565-1234.

To order additional copies of licensed publications, specify the SOFTWARE option. To order additional publications or CD-ROMs, specify the PUBLICATIONS & SLSS option. Be prepared to give your customer number, the product number, and the feature code(s) or order numbers you want.

Summary of Changes to DB2 for OS/390 Version 5

DB2 for OS/390 Version 5 delivers a database server solution for OS/390. Version 5 supports all functions available in DB2 for MVS/ESA Version 4 plus enhancements in the areas of performance, capacity, and availability, client/server and open systems, and user productivity.

If you are currently using DB2, **you can migrate only from a DB2 for MVS/ESA Version 4 subsystem**. This summary gives you an overview of the differences to be found between these versions.

Server Solution

OS/390 retains the classic strengths of the traditional MVS/ESA operating system, while offering a network-ready, integrated operational environment.

The following features work directly with DB2 for OS/390 applications to help you use the full potential of your DB2 subsystem:

- Net.Data for OS/390
- DB2 Installer
- DB2 Estimator for Windows
- DB2 Visual Explain
- Workstation-based Performance Analysis and Tuning

- DATABASE 2 Performance Monitor

Net.Data for OS/390

Net.Data provides support for Internet access to DB2 data through a Web server. Applications built with Net.Data make data stored in any DB2 server more accessible and useful. Net.Data Web applications provide continuous application availability, scalability, security, and high performance.

This no charge feature can be ordered with DB2 Version 5 or downloaded from Internet. The Net.Data URL is:

<http://www.ibm.com/software/data/net.data/downloads.html>

DB2 Installer

DB2 Installer offers the option to install DB2 on an OS/2 workstation. Now, you can use a friendly graphical interface to complete installation tasks easily with DB2 Installer.

This function is delivered on CD-ROM with DB2 Visual Explain.

DB2 Estimator for Windows

DB2 Estimator provides an easy-to-use capacity planning tool. You can estimate the sizes of tables and indexes, and the performance of SQL statements, groups of SQL statements (transactions), utility runs, and groups of transactions (capacity runs). From a simple table sizing to a detailed performance analysis of an entire DB2 application, DB2 Estimator saves time and lowers costs. You can investigate the impact of new or modified applications on your production system, *before* you implement them.

This no charge feature can be ordered with DB2 Version 5 or downloaded from the Internet. From the internet, use the IBM Software URL:

<http://www.ibm.com/software/>

From here, you can access information about DB2 Estimator using the download function.

DB2 Visual Explain

DB2 Visual Explain lets you tune DB2 SQL statements on an OS/2 workstation. You can see DB2 EXPLAIN output in a friendly graphical interface and easily access, modify, and analyze applications with DB2 Visual Explain.

Workstation-based Performance Analysis and Tuning

The new workstation-based Performance Analysis and Tuning function simplifies system administration. You can access statistical data to help you analyze and improve system performance. This function works with the optional DB2 PM feature to provide full analysis and tuning functionality.

DATABASE 2 Performance Monitor (DB2 PM)

DB2 PM lets you monitor, analyze, and optimize the performance of DB2 Version 5 and its applications. An online monitor, for both host and workstation environments, provides an immediate "snap-shot" view of DB2 activities and allows for exception processing while the system is operational. The workstation-based online monitor can connect directly to the Visual Explain function of the DB2 base product.

DB2 PM also offers a history facility, a wide variety of customizable reports for in-depth performance analysis, and an EXPLAIN function to analyze and optimize SQL statements. For more information, see *DB2 PM for OS/390 General Information*.

This feature can be ordered with DB2 Version 5.

Performance

Sysplex Query Parallelism

The increased power of Sysplex query parallelism in DB2 for OS/390 Version 5 allows DB2 to go far beyond DB2 for MVS/ESA Version 4 capabilities; from the ability to split and process a single query within a DB2 subsystem to processing that same query across many different DB2 subsystems in a data sharing group.

The advances this release offers in scalable query processing let you process queries quickly while accommodating the potential growth of data sharing groups and the increasing complexity of queries.

Prepared Statement Caching

DB2 reduces the cost of duplicate prepares for the same dynamic SQL statement by saving them in a cache. Now, different application processes can share prepared statements and they are preserved past the commit point. This performance improvement offers the most benefit for:

- Client/server applications that frequently use dynamic SQL for repeated execution of SQL statements
- Relatively short dynamic SQL statements for which PREPARE cost accounts for most of the CPU expended

Reoptimization

When host variables, parameter markers, or special registers were used in previous releases, DB2 could not always determine the best access path because the values for these variables were unknown. Now, you can tell DB2 to reevaluate the access path at run time, after these values are known. As a result, queries can be processed more efficiently, and response time is improved.

Faster Transactions and Batch

- Caching of package authorization improves performance at run time for remote packages and applications that use pattern-matching characters in a package list.
- You can define a table space to use ***selective partition locking***, which can reduce locking costs for applications that do partition-at-a-time processing. It also can reduce locking costs for certain data sharing applications that rely on an affinity between members and data partitions.

- A new standalone utility lets you preformat active logs.
- With LOAD and REORG, you can preformat data sets up to the high allocated RBA, which can make processing for sequential inserts more predictable.

Faster Utilities

- LOAD and REORG jobs run faster and more efficiently with enhanced index key sorting that reduces CPU and elapsed time, and an inline copy feature that lets you make an image copy without a separate copy step.
- New REORG options let you select rows to discard during a REORG and, optionally, write the discarded records to a file.
- When you run the REBUILD, RECOVER, REORG, or LOAD utility on DB2-managed indexes or table spaces, a new option lets you logically reset and reuse the DB2-managed objects.
- RECOVER INDEX and LOAD run faster on large numbers of rows per page.
- Sampling support for RUNSTATS reduces the processing required to collect nonindexed column statistics.
- BSAM striping improves the I/O capability of DB2 utilities.

Other Performance Enhancements

- There are several significant performance enhancements to data sharing, including selective partition locking, the MAXROWS option, and several optimizations to reduce data sharing overhead.
- DB2 installations that run in the OS/390 Version 2 Release 6 environment can now have as many as (approximately) 25 000 open DB2 data sets at one time. The maximum number of open data sets in earlier releases of OS/390 is 10000.
- You can easily alter the length of variable-length character columns using the new ALTER COLUMN clause of the ALTER TABLE statement.
- SQL CASE expressions let you eliminate queries with multiple UNIONS and improve performance by using only one table scan.
- You can collect a new statistic on concatenated index keys to improve the performance of queries with correlated columns. The statistic lets DB2 estimate the number of rows that qualify for the query more accurately, and select access paths more efficiently.
- DB2 scans partitions more efficiently and allows scans during parallel processing.
- Query enhancements include the ability to:
 - Use indexes for joins on string columns that have different lengths
 - Use an index to access predicates with noncorrelated IN subqueries
- Noncolumn expressions in simple predicates are evaluated at stage 1 and can be indexable.

Increased Capacity

DB2 for OS/390 Version 5 introduces the concept of a *large* partitioned table space. Defining your table space as large allows a substantial capacity increase: to approximately one terabyte of data and up to 254 partitions. In addition to accommodating growth potential, large partitioned table spaces make database design more flexible, and can improve availability.

Improved Availability

Online REORG

DB2 for OS/390 Version 5 adds a major improvement to availability with *Online REORG*. Now, you can avoid the severe availability problems that occurred while offline reorganization of table spaces restricted access to read only during the unload phase and no access during reload phase of the REORG utility. Online REORG gives you full read and write access to your data through most phases of the process with only very brief periods of read only or no access.

Data Sharing Enhancements

- Version 5 provides continuous availability with group buffer pool duplexing. Prior releases of DB2 rely on DASD and the merged recovery logs to recover group buffer pool (GBP) data that is lost if a coupling facility fails. With group buffer pool duplexing, DB2 writes changed pages to both a *primary GBP* and a *secondary GBP*. Overlapped writes to the GBPs provide good performance and eliminate the writes to DASD.
- Group buffer pool rebuild makes coupling facility maintenance easier and improves access to the group buffer pool during connectivity losses.
- Automatic group buffer pool recovery accelerates GBP recovery time, eliminates operator intervention, and makes data available faster when GBPs are lost because of coupling facility failures.
- Improved restart performance for members of a data sharing group reduces the impact of retained locks by making data available faster when a group member fails.
- Changes to traces and DISPLAY GROUPBUFFERPOOL output improve monitoring.

Tracker site for disaster recovery

You can set up a tracker site that shadows the activity of a primary site, and eliminate the need to constantly ship image copies.

Client/Server and Open Systems

Native TCP/IP Network Support

DB2's support of TCP/IP networks allows DRDA clients to connect directly to DDF and eliminate the gateway machine. In addition, customers can now use asynchronous transfer mode (ATM) as the underlying communication protocol for both SNA and TCP/IP connections to DB2.

Stored Procedures

- Return multiple SQL result sets to local and remote clients in a single network operation.
- Receive calls from applications that use standard interfaces, such as Open Database Connectivity** (ODBC) and X/Open** Call Level Interface, to access data in DB2 for OS/390.
- Run in an enhanced environment. DB2 supports multiple stored procedures address spaces managed by the MVS Workload Manager (WLM). The WLM environment offers efficient program management and allows WLM-managed stored procedures to run as subprograms and use RACF security.
- Use individual MVS dispatching priorities to improve stored procedure scheduling.
- Access data sources outside DB2 with two-phase commit coordination.
- Use an automatic COMMIT feature on return to the caller that reduces network traffic and the length of time locks are held.
- Have the ability to invoke utilities, which means you can now invoke utilities from an application that uses the SQL CALL statement.
- Support IMS Open Database Access (ODBA). Now a DB2 stored procedure can directly connect to IMS DBCTL and access IMS data.

Dynamic Query and Network Performance

Improvements for DRDA Applications

- Reduced processing costs for block fetch operations
- DRDA support for OPTIMIZE FOR n ROWS on SELECT
- Faster dynamic SQL queries and reduced processing costs for VTAM network operations
- Reduced message traffic for dynamic SQL SELECT statements

Improved Application Portability

- DB2 for OS/390 Version 5 introduces the DB2 Call Level Interface (CLI) to MVS/ESA. Unlike applications that use embedded SQL to access DB2 data, applications that choose CLI are not tied to a precompiler, packages, or a plan.

Workstation and desktop applications use standard interfaces, such as Open Database Connectivity (ODBC), to access relational data. Standard interfaces need one version of an application to access many data sources. Now, you can port UNIX workstation and PC desktop applications to DB2 for OS/390 and exploit the CLI (ODBC) capabilities without modification. In addition, applications can issue ODBC or CLI calls from within a stored procedure.
- You can now access DB2 for OS/390 databases in your Java applications. You can use DB2 Connect Java Database Connectivity (JDBC) for your dynamic SQL applications, or SQLJ for your static SQL applications.
- DB2 adds DRDA support for the DESCRIBE INPUT statement to improve performance for many ODBC applications.
- Now, you can write multithreaded DB2 CLI applications, and restrictions on connection switching no longer exist.

- DB2 now provides ASCII table support for clients and servers across platforms. This support reduces the cost of translation between EBCDIC and ASCII encoding schemes. ASCII table support also offers an alternative to writing field procedures that provide the ASCII sort sequence, which improves performance.

Improved Security

- DB2 for OS/390 supports Distributed Computing Environment (DCE) for authenticating remote DRDA clients. DCE offers the following benefits:
 - Network security: By providing an encrypted DCE ticket for authentication, remote clients do not need to send an MVS password in readable text.
 - Simplified security administration: End users do not need to maintain a valid password on MVS to access DB2; instead, they maintain their DCE password only.
- New descriptive error codes help you determine the cause of network security errors.
- You can change end user MVS passwords from DRDA clients.

User Productivity

Improved SQL Compatibility

DB2 conforms to the ANSI/ISO SQL entry level standard of 1992. Application programmers can take advantage of a more complete set of standard SQL to use across the DB2 family to write portable applications. New SQL function includes:

- More check options for view definitions.
- Foreign keys that reference UNIQUE keys as well as PRIMARY keys.
- An extension to GRANT that lets the REFERENCES privilege apply to a list of columns.
- A new delete rule, NO ACTION, that you can use to define referential constraints for self-referencing tables.
- SQL CASE expressions provide the capability to create conditional logic wherever an expression is allowed.
- SQL temporary tables allow application programs to easily create and use temporary tables that store results of SQL transactions without logging or recovery.

New Access Choice

A new attachment facility, the Recoverable Resource Manager Services attachment facility, improves access in a client/server environment. It coordinates two-phase commit processing between DB2 and other participating resource managers in any MVS application environment. Other key features include the ability for multiple users to run in a single address space, thread reuse, and moving threads between MVS tasks.

Image Copy Enhancements

The COPY, LOAD, and REORG utilities provide:

- Features of the COPY utility that help you quickly determine what type of image copy to take, when to take it, and let DB2 automatically take it for you.

- Inline copy in LOAD and REORG that lets you create an image copy while improving data availability.

Improved Integration of C++ and IBM COBOL for MVS & VM Support

It is easier for application programmers to use object-oriented programming techniques in their DB2 applications. DB2 for OS/390 Version 5 adds COBOL and C++ languages as options on installation panels, DB2I panels, the DSNH command, and DCLGEN.

Other Usability Enhancements

- To prevent long running units of work and to help avoid unnecessary work during the recovery phase of restart, DB2 issues new warning messages at an interval of your choice.
- A new special register for decimal precision provides better granularity, so that applications that need different values for decimal precision can run in the same DB2 subsystem.
- Trace records for IFCID 0022 now include most information in the PLAN_TABLE.
- An increase from 127 to 255 rows on a page improves table space processing and eliminates the need for compression.
- Install SYSOPR can recover objects using the START DATABASE command.
- A filtering capability for DISPLAY BUFFERPOOL limits statistics information to a specified set of page sets.
- You can enter comments within the SYSIN input stream for DB2 utilities.

Summary of Changes to This Book

Specific changes to this publication, reflecting the functional enhancements described above, are summarized below.

“Chapter 2. Commands” on page 21 introduces the following new command:

```
ALTER UTILITY (DB2)
```

New options are available for the following commands:

ALTER BUFFERPOOL (DB2)	MODIFY irlmproc,STATUS
ALTER GROUPBUFFERPOOL (DB2)	REBIND PACKAGE
BIND PACKAGE (DB2)	REBIND PLAN
BIND PLAN (DB2)	RESET INDOUBT (DB2)
DISPLAY BUFFERPOOL (DB2)	START DATABASE (DB2)
DISPLAY DATABASE (DB2)	START DD (DB2)
DISPLAY GROUP (DB2)	START PROCEDURE (DB2)
DISPLAY GROUPBUFFERPOOL (DB2)	START TRACE (DB2)
DISPLAY LOCATION (DB2)	STOP DATABASE (DB2)
DISPLAY THREAD (DB2)	STOP DDF (DB2)
DISPLAY TRACE	STOP PROCEDURE (DB2)
DISPLAY UTILITY (DB2)	STOP TRACE (DB2)
DSNH (TSO CLIST)	

Naming Conventions

When a parameter refers to an object created by SQL statements (for example, tables, table spaces, and indexes), SQL syntactical naming conventions are followed.

This section describes naming conventions unique to commands. Characters are classified as *letters*, *digits*, or *special characters*.

- A *letter* is any one of the uppercase characters A through Z (plus the three characters reserved as alphabetic extenders for national languages, #, @, and \$ in the United States).
- A *digit* is any one of the characters 0 through 9.
- A *special character* is any character other than a letter or a digit.

See Chapter 3 of *SQL Reference* for an additional explanation of long identifiers, short identifiers, and location identifiers.

authorization-id

A short identifier of 1 to 8 letters, digits, or the underscore that identifies a set of privileges. An authorization ID must begin with a letter.

collection-id

An SQL long identifier of 1 to 18 letters, digits, or the underscore that identifies a collection of packages; therefore, a collection ID is a qualifier for a package ID. A collection ID must begin with a letter.

A collection ID should not begin with DSN; this can sometimes conflict with DB2-provided collection IDs. If a collection ID beginning with DSN is specified, DB2 issues a warning message.

connection-name

An identifier of 1 to 8 characters that identifies an address space connection to DB2. A connection identifier is one of the following:

- For DSN processes running in TSO foreground, the connection name "TSO" is used.
- For DSN processes running in TSO batch, the connection name BATCH is used.
- For the call attachment facility (CAF), the connection name DB2CALL is used.
- For the Recoverable Resource Manager Services attachment facility (RRSAF), the connection name RRSAF is used.
- For IMS and CICS processes, the connection name is the system identification name.

See Section 4 (Volume 1) of *Administration Guide* for more information about connection names.

correlation-id

An identifier of 1 to 12 characters that identifies a process within an address space connection. A correlation ID must begin with a letter.

A correlation ID can be one of the following:

- For DSN processes running in TSO foreground, the correlation ID is the TSO logon identifier.
- For DSN processes running in TSO batch, the correlation ID is the job name.
- For CAF processes, the correlation ID is the TSO logon identifier.
- For RRSF processes, the correlation ID is the value specified during signon.
- For IMS processes, the correlation ID is *pst#.psbname*.
- For CICS processes, the correlation ID is *identifier.thread_number.transaction_identifier*.

See Section 4 (Volume 1) of *Administration Guide* for more information about correlation IDs.

data-set-name

An identifier of 1 to 44 characters that identifies a data set.

dbrm-member-name

An identifier of 1 to 8 letters or digits that identifies a member of a partitioned data set. (MVS requires this naming convention.)

A DBRM member name should not begin with DSN; this can sometimes conflict with DB2-provided DBRM member names. If a DBRM member name beginning with DSN is specified, DB2 issues a warning message.

dbrm-pds-name

An identifier of 1 to 44 characters that identifies a partitioned data set.

ddname

An identifier of 1 to 8 characters that designates the name of a DD statement.

hexadecimal-constant

A sequence of digits or any of the letters from A to F (uppercase or lowercase).

hexadecimal-string

An X followed by a sequence of characters that begins and ends with an apostrophe. The characters between the string delimiters must be a hexadecimal number.

ip address (or Internet address)

A 4 byte value that uniquely identifies a TCP/IP host within the TCP/IP network. IP addresses are usually displayed in a format called *dotted decimal*, where each byte of the IP address is displayed in decimal format with a period delimiting each number.

location-name

A location identifier of 1 to 16 letters (but excluding the alphabetic extenders), digits or the underscore that identifies an instance of a data base management system. A location name must begin with a letter.

luname

An SQL short identifier of 1 to 8 characters that identifies a logical unit name. An luname must begin with a letter.

luwid

A fully qualified LU network name and an LUW instance number.

The LU network name consists of an optional 8 character network ID, a period, and an 8 character network LU name. If you indicate no network ID, no period is required. The LUW instance number consists of 12 hex characters that uniquely identify the unit of work.

member-name

An identifier of 1 to 8 characters that identifies either a member of a partitioned data set (MVS requires this naming convention) or a member of a data sharing group.

A name for a member of a partitioned data set should not begin with DSN; this can sometimes conflict with DB2-provided member names. If a name beginning with DSN is specified, DB2 issues a warning message.

package-id

An SQL short identifier of 1 to 8 letters, digits, or underscores that identifies a package. For packages created under DB2, a package ID is the name of the program whose precompilation produced the package's DBRM. A package ID must begin with a letter. (MVS requires this naming convention.)

A package ID should not begin with DSN; this can sometimes conflict with DB2-provided package IDs. If a package ID beginning with DSN is specified, DB2 issues a warning message.

package-name

A name given to the object created during the bind process of a single package. A package name consists of a location name, a collection ID, and a package ID separated by periods. An additional attribute, a version ID, allows for multiple versions of a package to have the same name.

plan-name

An SQL short identifier of 1 to 8 letters or digits that identifies an application plan. A plan name must begin with a letter.

A plan name should not begin with DSN; this can sometimes conflict with DB2-provided plan names. If a plan name beginning with DSN is specified, DB2 issues a warning message.

qualifier-name

An SQL short identifier of 1 to 8 letters, digits, or the underscore that identifies the implicit qualifier for unqualified table names, views, indexes, and aliases.

string

A sequence of characters that begins and ends with an apostrophe.

subsystem-name

An identifier that specifies the DB2 subsystem as it is known to MVS.

table-name

A qualified or unqualified name that designates a table. A table name can contain one or two parts, depending upon its qualification. The first part is the authorization ID that designates the owner of the table; the second part is an SQL long identifier. A period must separate each of the parts.

table-space-name

A short identifier that designates a table space of an identified database. If a database is not identified, a table space name specifies a table space of database DSNDB04.

utility-id

An identifier of 1 to 16 characters that uniquely identifies a utility process within DB2. A utility ID must begin with a letter, and the identifier can contain periods.

version-id

An SQL identifier of 1 to 64 letters, digits, lowercase alphabetic letters, underscores, periods, dashes, or colons that is assigned to a package when the package is created. The version ID that is assigned is taken from the version ID associated with the program being bound. Version IDs are specified for programs as a parameter of the DB2 precompile.

Privileges and Authorization IDs

The issuer of a command can be an individual user. It can also be a program running in batch mode or an IMS or CICS transaction. We use the term *process* to represent any or all of those.

A process is represented to DB2 by a set of identifiers (IDs). What the process can do with DB2 is determined by *privileges* and *authorities* that can be held by its identifiers. We use “*the privilege set of a process*” to mean the entire set of privileges and authorities that can be used by the process in a specific situation.

There are three types of identifiers: primary authorization IDs, secondary authorization IDs, and SQL IDs.

- Generally it is the primary authorization ID that identifies a specific process. For example, in the process initiated through the TSO attachment facility, the primary authorization ID is identical to the TSO logon ID. A trace record identifies the process by that ID.
- Secondary authorization IDs, which are optional, can hold additional privileges available to the process. A secondary authorization ID is often a Resource Access Control Facility group ID. For example, a process can belong to a RACF group that holds the LOAD privilege on a particular database. Any member of the group can run the LOAD utility to load table spaces in the database.

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

- An SQL authorization ID (SQL ID) holds the privileges exercised when issuing certain dynamic SQL statements. This ID plays little part in the commands described in this book.

Within DB2, a process can be represented by a primary authorization ID and possibly one or more secondary IDs. For detailed instructions on how to associate a process with one or more IDs, and how to grant privileges to those IDs, see “Processing Connections” and “Processing Sign-ons” in Section 3 (Volume 1) of *Administration Guide*.

A privilege or authority is granted to, or revoked from, an identifier by executing an SQL GRANT or REVOKE statement. For the complete syntax of those statements, see Chapter 6 of *SQL Reference*.

The Bind Process

The bind process establishes a relationship between an application program and its relational data. This step is necessary before you can execute your program. Currently, DB2 allows you two basic ways of binding a program: to a package, or directly to an application plan. If your application uses DRDA access to distribute data, then you must use packages.

During the precompilation process, the DB2 precompiler produces both modified source code and a database request module (DBRM) for each application program. The modified source code must be compiled and link-edited before the application program can be run. DBRMs must be bound to a plan or package.

When determining the maximum size of a plan, you must consider several physical limitations, including the time required to bind the plan, the size of the EDM pool, and fragmentation. There are no restrictions to the number of DBRMs that can be included in a plan. However, packages provide a more flexible method for handling large numbers of DBRMs within a plan. As a general rule, it is suggested that the EDM pool be at least 10 times the size of the largest DBD or plan, whichever is greater. For further information, see Section 2 of *Installation Guide*.

The BIND PACKAGE subcommand allows you to bind DBRMs individually. It gives you the ability to test different versions of an application without extensive rebinding. Package binding is also the only method for binding applications at remote sites.

Even when they are bound into packages, all programs must be designated in an application plan. BIND PLAN establishes the relationship between DB2 and all DBRMs or packages in that plan. Plans can specify explicitly named DBRMs, packages, collections of packages, or a combination of these elements. The plan contains information about the designated DBRMs or packages and about the data the application program intends to use. It is stored in the DB2 catalog.

In addition to building packages and plans, the bind process:

- **Validates the SQL statements using the DB2 catalog.** During the bind process, DB2 checks your SQL statements for valid table, view, and column names. Because the bind process occurs as a separate step before program execution, errors are detected and can be corrected before the program is executed.
- **Verifies that the process binding the program is authorized to perform the data accessing operations requested by your program's SQL statements.** When you issue BIND, you can specify an authorization ID as the owner of the plan or package. The owner can be any one of the authorization IDs of the process performing the bind. The bind process determines whether the owner of the plan or package is authorized to access the data the program requests.
- **Selects the access paths needed to access the DB2 data your program wants to process.** In selecting an access path, DB2 considers indexes, table

sizes, and other factors. DB2 considers all indexes available to access the data and decides which ones (if any) to use when selecting a path to the data.

BIND PLAN and BIND PACKAGE can be accomplished using DB2I panels, the DSNH CLIST, or the DSN subcommands BIND PLAN and BIND PACKAGE. For a detailed explanation of binding with DSNH CLIST, see Chapter 2. Commands. A complete description of the bind process can be found in Section 5 of *Administration Guide*. Further information on BIND can be found in “BIND PACKAGE (DSN)” on page 46 and in “BIND PLAN (DSN)” on page 51. Information about specific options for BIND PLAN and BIND PACKAGE can be found in “Options of BIND and REBIND for PLAN and PACKAGE” on page 56.

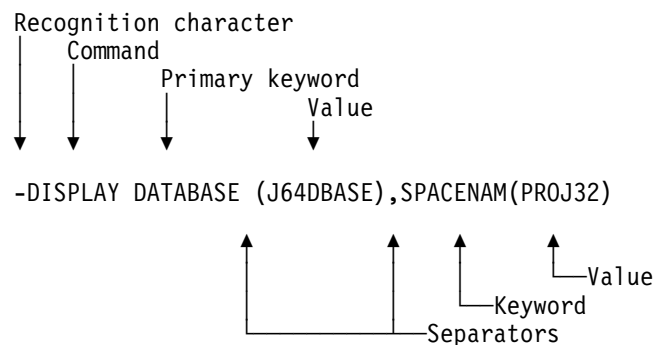
Chapter 2. Commands

This chapter contains syntax diagrams, semantic descriptions, rules, and usage examples of commands, organized alphabetically by command name.

The tables at the beginning of this chapter summarize the commands that follow. Each table lists commands of one type, describes their functions, and refers to the page on which a complete description begins.

DB2 Command Parsing

DB2 commands follow a pattern like this:



Parts of a DB2 Command

The parts of a command are:

- *Recognition character*. It is shown as a hyphen throughout this book, with the following exceptions:

- If the command is issued from an MVS console, the recognition character must be the *command prefix*.

In DB2 Version 5, the command prefix can be up to eight characters. The default is '-DSN1'. However, the majority of examples in this book assume that the command prefix has been defined as a hyphen (-). Examples involving members of a data sharing group demonstrate the use of multi-character command prefixes, such as -DB1G.

Inserting a space between the command prefix and the command is optional. For example, you can use either one of the following formats:

```
-DB1GDIS THREAD(*)  
-DB1G DIS THREAD(*)
```

Using a space makes it easier for users to identify the command, especially when the command prefix has multiple characters.

The command prefix can be defined at installation time. For more information, see Section 2 of *Installation Guide*.

- If the command is issued from an IMS terminal, the recognition character must be the command recognition character (CRC). The command recogni-

tion character is defined in the IMS SSM PROCLIB member. For more information, see *IMS/ESA Customization Guide*.

- If the command is issued from a CICS terminal or under the DSN command processor, the recognition character must be a hyphen.
- *Command name*. Command names have abbreviations, which are provided in the command descriptions in this chapter.
- *Operands*. These are combinations of keywords and parameters that can be specified for the command.
 - *Keywords* can be required or optional. They must be entered exactly as shown in the descriptions of the commands.
 - A keyword can have zero or more *parameters*. A parameter list, if present, must be enclosed in parentheses.
 - *Separators*. These can be one or more blanks or commas. An open parenthesis marks the beginning of a parameter list; no separator is needed. Optionally, an equal sign can be used to separate a single parameter from its keyword without using parentheses.

Characters with Special Meanings

The following characters have special meaning for the syntax of DB2 commands:

A blank is a separator.

Multiple blanks are equivalent to a single blank, except in strings enclosed between apostrophes.

, A comma is a separator.

' An apostrophe is the usual SQL string constant delimiter, and marks the beginning or end of a string constant in SQL. (In COBOL programs only, the QUOTESQL precompiler option allows you to choose the quotation mark as the SQL string delimiter; the apostrophe is then the SQL escape character.)

Letters not in string constants are changed to uppercase. Two successive apostrophes in a string constant are changed to one apostrophe. Blanks, commas, equal signs, and parentheses in string constants are treated as literal characters, and are not recognized as separators.

There is an exception to the rule about changing letters to uppercase. If the CODED CHARACTER SET install option is set to 930 or 5026 during installation, the letters are not folded to uppercase, whether in an SQL string constant or not.

" A quotation mark is the SQL escape character, and marks the beginning or end of an SQL delimited identifier. (In COBOL programs only, the QUOTESQL precompiler option allows you to choose the apostrophe as the SQL escape character; the double quotation mark is then the SQL string delimiter.)

Within a string delimited by quotation marks, two successive quotation marks are changed to one. Other rules are the same as for SQL string constants.

= An equal sign separates a single parameter from a keyword. Thus, an equal sign is used as a separator for keywords that have only one parameter. An equal sign can be used for keywords with multiple parameters when only one member of the parameter list is specified.

- (An open parenthesis marks the beginning of a parameter list.
-) A close parenthesis marks the end of a parameter list.
- : A colon means an inclusive range. For example, (A:D) means the same as (A,B,C,D); (1:5) means (1,2,3,4,5). The colon can be used this way only in commands where this operation is specifically permitted.
- * An asterisk means “all” or “subset beginning with.” For example, DISPLAY UTILITY (*) displays the status of all utilities; DISPLAY UTILITY (R2*) displays the status of all utilities whose identifiers begin with R2. The asterisk can be used this way only in commands in which the operation is specifically permitted.

NO (two-character string) negates the keyword that follows.

A negated keyword means the opposite of the keyword itself, and is often used to override a keyword default. In keywords that have no opposite meaning, the initial characters NO can be merely part of the keyword itself; for example, in NODE.

Examples of Keyword Entry

The following are general examples of valid keywords and parameters:

- MODE (FORCE)
- MODE=FORCE
- MODE (NOFORCE) (keyword negation)
- MODE=NOFORCE (keyword negation)
- DATABASE(name1 name2 . . . namen) ACCESS(RO)
- SPACENAM (name1,name2) ACCESS(RO)
- ACCESS (RO),SPACENAM=name
- Combinations of the above

Do not use more than one parameter after an equal sign or an error condition will occur.

Scope of Commands

In a data sharing environment, the *scope* of a command is the breadth of its impact:

Member Many commands used in a data sharing environment have *member* scope because they affect only the DB2 for which they are issued. For example, a DISPLAY THREAD command displays only those threads that exist for the member identified by the command prefix.

Group Other commands have *group* scope because they affect an object in such a way that affects all members of the group. For example, a STOP DATABASE command issued from any member of the group stops that database for all members of the group.

The commands that have group scope are:

ALTER GROUPBUFFERPOOL (DB2)	DISPLAY UTILITY (DB2)
BIND PACKAGE (DSN)	FREE PACKAGE (DSN)
BIND PLAN (DSN)	REBIND PACKAGE (DSN)
DCLGEN (DSN)	FREE PLAN (DSN)
DISPLAY DATABASE (DB2)	REBIND PLAN (DSN)

DISPLAY GROUP (DB2)	START DATABASE (DB2)
DISPLAY GROUPBUFFERPOOL (DB2)	STOP DATABASE (DB2)

These commands have either group or member scope, depending on what option you specify with them:

ARCHIVE LOG (DB2)
MODIFY irlmproc,STATUS (MVS IRLM)
TERM UTILITY (DB2)

All other commands have member scope. The description of each command includes its scope. For more details on data sharing, see *Data Sharing: Planning and Administration* .

Extended MCS Consoles

DB2 supports the extended MCS console support of MVS, allowing installations to define more than 99 consoles.

Output from DB2 Commands

The amount of output that you receive from a DB2 command is always less than 256KB. The following factors determine the maximum amount of output you can receive:

- The amount of storage available to your DB2 subsystem or to an individual command.
- The environment from which you issue the DB2 command.

For example, if you issue a DB2 command from an IMS console, you can receive no more than 32KB of output.

- For DISPLAY DATABASE, the value of the LIMIT parameter.
- For DISPLAY THREAD, the number of lines of output.

DISPLAY THREAD does not display more than 254 lines of output.

DSN Subcommand Parsing

The parsing of DSN subcommands conforms to standard TSO command parsing conventions. For information about TSO command parsing, see *TSO/E Programming Services*.

To continue a subcommand on the next line while using the DSN processor, type either a hyphen (-) or a plus sign (+) at the end of the current line. If you use a plus sign, precede it by at least one blank character to prevent the concatenation of character strings from line to line. Using a plus sign causes TSO/E to delete leading delimiters (blanks, commas, tabs, and comments) on the continuation line, and will reduce the overall size of the command.

Abbreviations

The names of the DSN command and its subcommands cannot be abbreviated. For compatibility with prior releases of DB2, abbreviations for some keywords are allowed. However, to avoid potential problems, *it is recommended that keywords never be abbreviated.*

Description of Commands

The commands are divided into these categories:

- The DSN Command and Its Subcommands
- DB2 Commands
- IMS Commands
- CICS Attachment Facility Commands
- MVS IRLM Commands
- TSO CLISTS

The DSN Command and Its Subcommands

Environment: The DSN command runs under TSO in either the foreground or background. All of its subcommands, except SPUFI, run under DSN in either the foreground or background, and all, except END, also run under DB2 Interactive (DB2I). SPUFI runs only in the foreground under ISPF.

Table 1. DSN Command and Subcommands

DSN Command or Subcommand	Function	Refer to Page
BIND	Builds an application package or plan	46, 51
DB2 commands	Execute a DB2 command	Table 2 on page 26
DCLGEN	(DECLARATIONS GENERATOR) Produces declarations for tables or views	87
DSN	Starts a DSN session	163
END	Ends the DSN session	203
FREE	Deletes an application package or plan	204, 207
REBIND	Updates an application package or plan	224, 227
RUN	Executes an application program	240
SPUFI	Executes the SQL Processor Using File Input	246
*	A comment	163

DB2 Commands

Environment: The command START DB2 can be issued only from an MVS console. All other DB2 commands can be issued from:

- An MVS console
- A DSN session
- A DB2I panel
- An IMS terminal
- A CICS terminal
- An application program, using the DB2 instrumentation facility interface (IFI)

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

Extended MCS Consoles: The extended MCS console feature of MVS lets an MVS system have more than 99 consoles. Because DB2 supports extended MCS consoles, messages returned from a DB2 command are routed to the extended MCS console that issued the command. See *MVS/ESA Planning: Operations* for more information on extended MCS consoles.

Table 2 (Page 1 of 2). DB2 Commands

DB2 Command	Function	Refer to Page
-ALTER BUFFERPOOL	Alters attributes for the buffer pools	29
-ALTER GROUPBUFFERPOOL	Alters attributes for the group buffer pools	34
-ALTER UTILITY	Alters parameter values of the REORG utility.	37
-ARCHIVE LOG	Enables a site to close a current active log and open the next available log data set	40
-CANCEL THREAD	Cancels processing for specific local or distributed threads	81
-DISPLAY ARCHIVE	Displays information about archive log processing	98
-DISPLAY BUFFERPOOL	Displays information about the buffer pools	100
-DISPLAY DATABASE	Displays status information about DB2 databases	108
-DISPLAY GROUP	Displays information about the data sharing group to which a DB2 subsystem belongs	119
-DISPLAY GROUPBUFFERPOOL	Displays status information about DB2 group buffer pools	123
-DISPLAY LOCATION	Displays status information about distributed threads	134
-DISPLAY PROCEDURE	Displays status information about stored procedures	138
-DISPLAY RLIMIT	Displays status information about the resource limit facility (governor)	141
-DISPLAY THREAD	Displays information about DB2 threads	142
-DISPLAY TRACE	Displays information about DB2 traces	154
-DISPLAY UTILITY	Displays status information about a DB2 utility	159
-MODIFY TRACE	Changes the IFCIDs (trace events) associated with a particular active trace	221
-RECOVER BSDS	Reestablishes dual bootstrap data sets	231
-RECOVER INDOUBT	Recovers threads left indoubt	232
-RESET GENERICCLU	Purges information stored by VTAM in the coupling facility	235
-RESET INDOUBT	Purges information displayed in the indoubt thread report generated by the -DISPLAY THREAD command	237

Table 2 (Page 2 of 2). DB2 Commands

DB2 Command	Function	Refer to Page
-SET ARCHIVE	Controls the allocation of tape units and the deallocation time of the tape units for archive log processing	243
-START DATABASE	Makes the specified database available for use	249
-START DB2	Initializes the DB2 subsystem (can be issued only from an MVS console)	255
-START DDF	Starts the distributed data facility	258
-START PROCEDURE	Activates the definition of stopped or cached stored procedures	263
-START RLIMIT	Starts the resource limit facility (governor)	266
-START TRACE	Initiates DB2 trace activity	268
-STOP DATABASE	Makes specified databases unavailable for applications	279
-STOP DB2	Stops the DB2 subsystem	284
-STOP DDF	Stops the distributed data facility	286
-STOP PROCEDURE	Stops the acceptance of SQL CALL statements for stored procedures	290
-STOP RLIMIT	Stops the resource limit facility (governor)	293
-STOP TRACE	Stops trace activity	294
-TERM UTILITY	Terminates execution of a utility	299

Completion Messages: Message DSN9022I indicates the normal end of DB2 command processing; DSN9023I indicates the abnormal end of DB2 command processing.

IMS Commands

Environment: Each IMS command can be issued from an IMS terminal.

Table 3. IMS Commands

IMS Command	Function	Refer to Page
/CHANGE	Resets an indoubt recovery unit	85
/DISPLAY	Displays the status of the connection between IMS and the specified subsystem (DB2), or displays the outstanding recovery units associated with the specified subsystem (DB2)	95
/SSR	Allows the IMS operator to enter an external subsystem (DB2) command	247
/START	Makes available the connection between IMS and the specified external subsystem (DB2)	248
/STOP	Prevents application programs from accessing the external subsystem's (DB2's) resources	278
/TRACE	Allows users to direct and control IMS tracing activities	302

CICS Attachment Facility Commands

Environment: Each CICS attachment facility command can be issued from a CICS terminal.

Table 4. CICS Attachment Facility Commands

CICS Attachment Facility Commands	Function	Refer to Page
DSNC	Allows you to enter DB2 commands from CICS	166
DSNC DISCONNECT	Disconnects threads	167
DSNC DISPLAY	Displays information on CICS transactions	169
DSNC MODIFY	Modifies the ERRDEST entry in the resource control table (RCT), or modifies the maximum active thread value associated with a given transaction or group name	173
DSNC STOP	Stops the CICS attachment facility	175
DSNC STRT	Starts the CICS attachment facility	176

MVS IRLM Commands

Environment: Each MVS IRLM command can be issued from an MVS console.

Table 5. MVS Commands Affecting the IRLM

MVS Command	Function	Refer to Page
MODIFY irlmproc, ABEND	Abends IRLM	209
MODIFY irlmproc, SET	Dynamically sets the maximum CSA or the number of trace buffers allowed for IRLM.	213
MODIFY irlmproc, STATUS	Displays IRLM status	215
START irlmproc	Starts an IRLM component with an installation-supplied procedure	259
STOP irlmproc	Shuts down IRLM normally	288
TRACE CT	Starts, stops, or modifies IRLM tracing	304

TSO CLISTS

Table 6. TSO CLISTS

CLIST	Function	Refer to Page
DSNH	Prepares a program for execution, and executes it if it runs under TSO. Runs under TSO in foreground or background.	178
DSNU	Generates JCL to execute DB2 utility jobs. Can be executed directly or by using DB2I. For details on this command procedure, see <i>Utility Guide and Reference</i> .	

-ALTER BUFFERPOOL (DB2)

The DB2 command ALTER BUFFERPOOL alters attributes for active or inactive buffer pools. Altered values are remembered until altered again.

Abbreviation: -ALT BPOOL

Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

Data Sharing Scope: Member

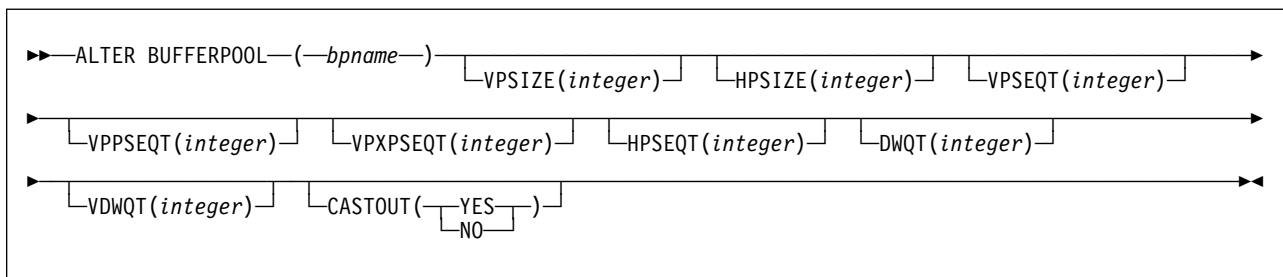
Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

Syntax



Option Descriptions

(bpname)

Names the buffer pool to alter.

- 4KB page buffer pools are named BP0, BP1, ..., BP49
- 32KB page buffer pools are named BP32K, BP32K1, ..., BP32K9

VPSIZE (*integer*)

Changes the virtual buffer pool size.

integer specifies the number of buffers to allocate to the active virtual buffer pool.

integer can range from 0 to 400000 for 4KB page buffer pools other than BP0. For BP0, the minimum value is 56. For 32KB page buffer pools, the range is from 0 to 50000.

-ALTER BUFFERPOOL (DB2)

DB2 limits the total VPSIZE for all buffer pools to 1.6GB. However, the amount of available real and virtual storage can further limit the amount of buffer pool storage DB2 can acquire.

If you specify VPSIZE as 0 for an active buffer pool (other than BP0), DB2 quiesces all current database access and update activities for that buffer pool and then deletes the buffer pool. Later attempts to use table spaces or indexes assigned to that buffer pool fail.

HPSIZE (*integer*)

Changes the hiperpool size. If the buffer pool is active at the time the command is issued, the hiperpool is created, expanded, contracted, or deleted depending on the new HPSIZE value.

integer specifies the number of buffers for a hiperpool. For 4KB page hiperpools, the acceptable values range from 0 to 2,097,152. For 32KB page hiperpools, the range is from 0 to 262,144.

DB2 limits the total HPSIZE for all buffer pools to 8GB. However, the amount of available expanded or real storage can further limit the amount of buffer pool storage DB2 can acquire. A value of 0 can be specified for all buffer pools.

VPSEQT (*integer*)

Changes the sequential steal threshold for the virtual buffer pool.

integer specifies the sequential steal threshold for the virtual buffer pool. It is expressed as a percentage of the total virtual buffer pool size, and valid values range from 0 to 100. This threshold affects the allocation of buffers in the virtual buffer pool to page read requests that are part of a sequential access pattern. This includes pages being prefetched. If the number of buffers containing sequentially accessed pages exceeds the threshold, a sequential request attempts to reuse one of those buffers rather than a buffer containing a non-sequentially accessed page. The initial default value is 80.

When VPSEQT=0, sequentially accessed pages are not kept in the virtual buffer pool after being released by the accessing agent. Also, prefetch is disabled.

When VPSEQT=100, DB2 does not prefer reusing sequential buffers over using non-sequential buffers.

VPPSEQT (*integer*)

Changes the parallel sequential threshold for the virtual buffer pool. This threshold determines how much of the virtual buffer pool is used for parallel processing operations.

integer specifies the parallel sequential threshold for the virtual buffer pool. It is expressed as a percentage of the sequential steal threshold, and valid values range from 0 to 100. The initial default value is 50.

When VPPSEQT=0, parallel processing operations are disabled.

VPXPSEQT (*integer*)

Changes the assisting parallel sequential threshold for the virtual buffer pool. This threshold determines the portion of the virtual buffer pool that is used for processing queries that originate on other members of the data sharing group. It is valid and effective only when DB2 is on a data sharing mode; it is ignored when DB2 is not on a data sharing mode.

integer specifies the assisting parallel sequential threshold for the virtual buffer pool. It is expressed as a percentage of the parallel sequential threshold (VPPSEQT). Whenever the sequential steal threshold or the parallel sequential threshold is altered, it directly affects the portion of buffer resources dedicated to “assistant” parallel operations. The valid values range from 0 to 100. The initial default value is 0.

When VPXPSEQT=0, this bufferpool cannot be used to assist another DB2 with parallel processing.

HPSEQT (*integer*)

Changes the hiperpool sequential steal threshold.

integer specifies the sequential steal threshold for the hiperpool. It is expressed as a percentage of the total hiperpool size, and valid values range from 0 to 100. This threshold affects the allocation of hiperpool buffers when casting out sequentially accessed pages from the virtual pool. If the number of buffers in the hiperpool containing sequentially accessed pages exceeds the threshold, the buffer allocation for a sequentially accessed page attempts to reuse one of these buffers rather than a buffer containing a non-sequentially accessed page. The initial default is 80.

When HPSEQT=0, sequentially accessed pages are not cast out to the hiperpool.

When HPSEQT=100, DB2 does not prefer reusing sequential buffers over using non-sequential buffers.

DWQT (*integer*)

Changes the buffer pool's deferred write threshold.

integer specifies the deferred write threshold for the virtual buffer pool. It is expressed as a percentage of the total virtual buffer pool size, and valid values range from 0 to 90. This threshold determines when deferred writes begin, based on the number of unavailable (non-stealable) buffers. When the count of non-stealable buffers exceeds the threshold, deferred writes begin. The initial default value is 50.

VDWQT (*integer*)

Changes the buffer pool's vertical deferred write threshold.

integer specifies the vertical deferred write threshold for the virtual buffer pool. It is expressed as a percentage of the total virtual buffer pool size, and valid values range from 0 to 90. This threshold determines when deferred writes begin, based on the number of updated pages for a given dataset. When a dataset's updated buffer count exceeds the threshold, deferred writes begin for that dataset. This threshold can be overridden for page sets accessed by DB2 utilities and must be less than or equal to the value of DWQT. The initial default value is 10.

CASTOUT

Changes the CASTOUT attribute of the hiperspaces used to back the hiperpool.

When DB2 is installed, the **default** is **CASTOUT (YES)** for all hiperpools.

-ALTER BUFFERPOOL (DB2)

(YES)

Allows MVS to discard data cached in the hiperpool when a shortage of expanded storage arises. When data is discarded, hiperspace backing expanded storage pages is released.

(NO)

Tells MVS to assign a high priority to keeping the data cached in the hiperpool. Because this could severely limit the availability of expanded storage to other processes on the system, specify CASTOUT(NO) only for buffer pools associated with databases for which response time is critical.

Usage Notes

Changing Several Buffer Pool Attributes: A failure in modifying one buffer pool attribute has no effect on other modifications requested in the same command.

Insufficient Virtual Storage: If insufficient virtual storage is detected while expanding a virtual buffer pool or while creating or expanding a hiperpool, DB2 issues an error message, and the process terminates, leaving the virtual buffer pool or hiperpool with a smaller size than was requested. Similarly, DB2 issues an error message if it is unable to create a hiperspace.

Contracting an Active Virtual Buffer Pool: If you use ALTER BUFFERPOOL to contract the size of an active virtual buffer pool, DB2 contracts the pool by marking active buffers as "to be deleted," which means they are not reusable to satisfy other page requests. However, the virtual storage might not be freed immediately. A system administrator can determine the status of the buffer pool by issuing the DISPLAY BUFFERPOOL command.

Deleting an Active Buffer Pool: If you use ALTER BUFFERPOOL to delete an active buffer pool (by specifying 0 for VPSIZE), DB2 issues a message to indicate that it is ready to explicitly delete this buffer pool. Once DB2 accepts the delete buffer pool request, the buffer pool is marked as "delete pending". All current access to the buffer pool is quiesced, later access attempts fail with an error message, and all open page sets that refer to the buffer pool are closed.

Altering Hiperpool Attributes: If you use ALTER BUFFERPOOL to alter the CASTOUT attribute of an already active hiperpool, DB2 marks the hiperpool as temporarily unavailable, so transactions are executed using the buffer pool without its backing hiperspace. The hiperspaces backing the hiperpool are deleted and re-created with the new CASTOUT attribute. All pages that were cached in the hiperpool are purged before the hiperpool is activated again.

When DB2 is restarted, if a hiperpool could not be created, DB2 issues a warning message indicating the reason. Under this condition, DB2 comes up with only the virtual bufferpool created. Use ALTER BUFFERPOOL to set the HPSIZE value to 0 to avoid any further messages.

Altering Attributes Stored in the BSDS: The virtual bufferpool and hiperpool attributes that are stored in the BSDS cannot be changed off line.

Relating VPPSEQT and VPXSEQT: The Table 7 on page 33 explains how the two parallel sequential thresholds, VPPSEQT for parallel sequential and VPXPSEQT for assisting parallel sequential threshold, are related. VPXPSEQT is a percentage of VPPSEQT, which is itself a portion of VPSEQT. Multiply VPXPSEQT

by VPPSEQT to obtain the total amount of the virtual buffer pool that can be used to assist another DB2 with parallel processing. In addition, VPPSEQT is affected by changing VPSIZE and VPSEQT; therefore, VPXPSEQT is also affected by VPSIZE and VPSEQT. Further information on the relationships of the various thresholds and possible configurations, see Chapter 7 of *Data Sharing: Planning and Administration*.

Table 7. Relationship between VPPSEQT and VPXPSEQT

If VPPSEQT is ...	and VPXPSEQT is ...	the percentage of the virtual buffer pool available to assist sysplex query parallelism is...
50	50	25
50	100	50
100	50	50
anything	0	0
0	anything	0

Examples

Example 1: Set the virtual buffer pool and hiperpool for BP0 to 1000 and 10000 buffers, respectively.

```
-ALTER BUFFERPOOL(BP0) VPSIZE(1000) HPSIZE(10000)
```

Example 2: Set the sequential steal threshold of the virtual buffer pool for BP0 to 75 percent of the virtual pool size, while disabling caching of sequentially accessed pages in the hiperpool.

```
-ALTER BUFFERPOOL(BP0) VPSEQT(75) HPSEQT(0)
```

Example 3: Set the hiperpool size for BP4 to 10000 buffers and explicitly specify that cached data in the hiperpool for BP4 can be discarded.

```
-ALTER BUFFERPOOL(BP4) HPSIZE(10000) CASTOUT(YES)
```

Example 4: Delete BP1. Be very careful using this option because when you specify a 0 size for an active buffer pool, DB2 quiesces all current database access and fails all subsequent page set open requests.

```
-ALTER BUFFERPOOL(BP1) VPSIZE(0)
```

-ALTER GROUPBUFFERPOOL (DB2)

-ALTER GROUPBUFFERPOOL (DB2)

The DB2 command ALTER GROUPBUFFERPOOL alters attributes of group buffer pools.

Abbreviation: -ALT GBPOOL

Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

Data Sharing Scope: Group

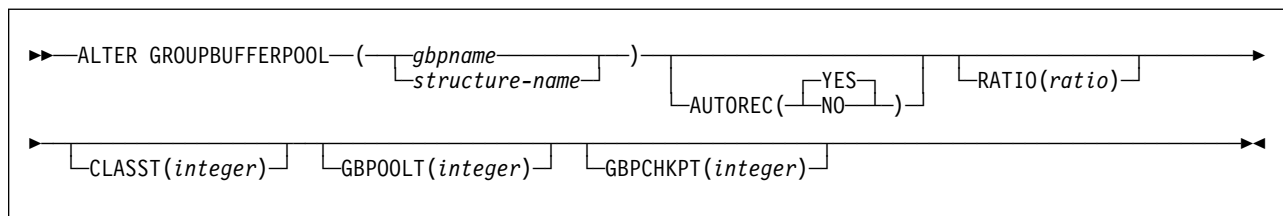
Authorization

To execute this command, the privilege set of the process must include one of the following authorities:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

Syntax



Option Descriptions

(gbpname)

Names the DB2 group buffer pool.

- 4KB group buffer pools are named GBP0, GBP1, ..., GBP49
- 32KB group buffer pools are named GBP32K, GBP32K1, ... , GBP32K9

(structure-name)

Names the backing coupling facility structure for the group buffer pool. The coupling facility structure name has the following format:

groupname_gbpname

where *groupname* is the DB2 data sharing group name and the underscore (_) separates *groupname* and *gbpname*.

AUTOREC

Specifies whether automatic recovery by DB2 takes place when a structure failure occurs or when the connectivity of all members of the group to the group buffer pool is lost.

(YES)

DB2 automatically recovers page sets and partitions that have a status of group buffer pool recovery pending (GRECP) and that have pages on the logical page list.

(NO)

Disables automatic recovery. Enter a START DATABASE command to recover page sets and partitions that have a status of GRECP or that have pages on the logical page list.

RATIO (*ratio*)

Changes the desired ratio in the group buffer pool of the number of directory entries to the number of data pages; that is, how many directory entries there are for each data page.

ratio can be a decimal number from 1.0 to 255, inclusive. Any digits after the first decimal place are ignored; for example, 5.67 is treated as 5.6. In numbers greater than 25, any digits after the decimal point are ignored; for example, 25.98 is treated as 25. The default is 5.

The actual number of directory entries and data pages that are allocated depends on the size of the coupling facility structure, which is specified in the coupling facility policy definitions.

CLASST (*integer*)

Changes the threshold at which class castout is started. It is expressed as a percentage of the size of the number of data entries; *integer* can range from 0 to 90. The default is 10.

As an example, CLASST(5) starts class castout when the number of pages in that class equals 5% of the group buffer pool page capacity.

GBPOOLT (*integer*)

Changes the threshold at which data in the group buffer pool is cast out to DASD. It is expressed as a percentage of the number of data entries; *integer* can range from 0 to 90. The default is 50.

As an example, GBPOOLT(55) casts out data if the number of pages in the group buffer pool equals 55% of the group buffer pool page capacity.

GBPCHKPT (*integer*)

Changes the time interval, in minutes, between successive checkpoints of the group buffer pool. *integer* can range from 1 to 999999. Unless a value is explicitly specified for the GBPCHKPT option, the value defaults to 8 minutes.

The more frequently checkpoints are taken, the less time it takes to recover the group buffer pool if the coupling facility fails.

-ALTER GROUPBUFFERPOOL (DB2)

Usage Notes

Defaults: Issuing the command does not change any option that is not explicitly specified; the default is to leave the value unchanged. When the command is first issued for a group buffer pool or a structure, the option defaults are as follows:

Option	Value
RATIO	5
CLASST	10 (%)
GBPOOLT	50 (%)
GBPCHKPT	8 (minutes)

When New Values Take Effect: A RATIO specification becomes effective only at the next allocation of the group buffer pool. The AUTOREC, checkpoint and threshold values take effect immediately.

Examples

Example 1: For group buffer pool 0, change the ratio of directory entries to data pages to 1 directory entry for every data page. The RATIO specification becomes effective at the next allocation of the group buffer pool.

```
-DB1G ALTER GROUPBUFFERPOOL (GBP0) RATIO(1)
```

Example 2: For group buffer pool 2, change the class castout threshold to 5% and the group buffer pool castout threshold to 30%. The new values take effect immediately.

```
-DB1G ALTER GROUPBUFFERPOOL (GBP2) CLASST(5) GBPOOLT(30)
```

Example 3: Assume that the DB2 group name is DSNCAT. For group buffer pool 3, change the class castout threshold to 5%. The new value takes effect immediately. Because the group name is DSNCAT, the coupling facility structure name is DSNCAT_GBP3. Also, in the event of a structure failure, the AUTOREC(YES) option enables DB2 to automatically recover the page sets and partitions that are in a GRECP status or that have pages on the logical page list.

```
-DB1G ALTER GROUPBUFFERPOOL (DSNCAT_GBP3) CLASST(5) AUTOREC(YES)
```

Example 4: For group buffer pool 32K, change the GBP checkpoint frequency to 5 minutes. The new value takes effect immediately. Here, with AUTOREC(NO) specified, you are in effect taking control of the recovery process rather than DB2 in the event of a structure failure. You might choose to do this to determine what pagesets or partitions are in a GRECP status or that have pages on the logical page list and before entering the START DATABASE command to enable DB2 to recover the data with the options you specify.

```
-DB1G ALTER GROUPBUFFERPOOL (GBP32K) GBPCHKPT(5) AUTOREC(NO)
```

-ALTER UTILITY (DB2)

The DB2 command ALTER UTILITY changes the values of certain parameters of an execution of the REORG utility that uses SHRLEVEL REFERENCE or CHANGE. Specifically, this command changes the values of DEADLINE, MAXRO, LONGLOG, and DELAY. For more information about those parameters and the REORG utility, see *Utility Guide and Reference*.

REORG can be altered only from the DB2 on which it is running.

Abbreviation: -ALT UTIL

Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or a CICS terminal, or a program using the instrumentation facility interface (IFI).

Data Sharing Scope: Member

Authorization

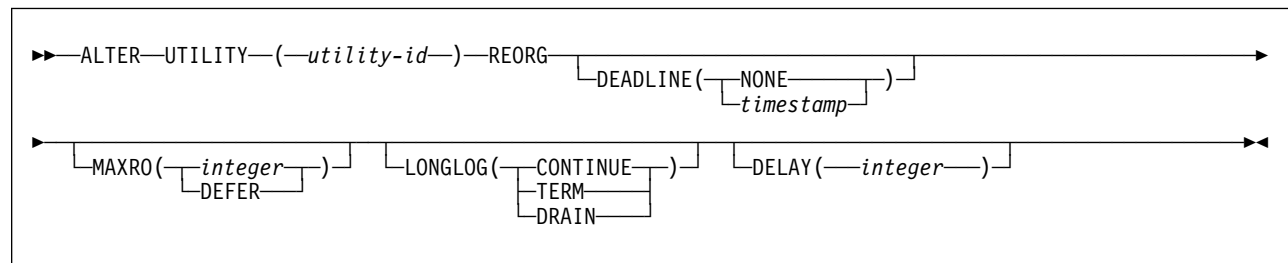
To execute this command, the primary or some secondary authorization ID of the process must be the ID that originally submitted the utility job, or the privilege set of the process must include one of the following authorities:

- DBMAINT, DBCTRL, or DBADM authority
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands that are issued from an MVS console are not associated with any secondary authorization IDs.

For users with DBMAINT, DBCTRL, or DBADM authority, the command takes effect only when a user has sufficient authority over each object that the utility job accesses.

Syntax



Option Descriptions

(utility-id)

Is the utility identifier, or the UID parameter, used when creating the utility job step.

This job must execute REORG with SHRLEVEL CHANGE or SHRLEVEL REFERENCE.

-ALTER UTILITY (DB2)

If *utility-id* was created by the DSNU CLIST by default, it has the form *tso-userid.control-file-name*. For the control file name that is associated with each utility, see *Utility Guide and Reference*.

If *utility-id* was created by default by the EXEC statement that executed DSNUTLIB, then this token has the form *userid.jobname*.

DEADLINE

Specifies the deadline by which the user wants the switch phase of reorganization to start. If DB2 estimates that the switch phase will not start by the deadline, DB2 terminates reorganization. The default is the most recently specified value of DEADLINE.

The pre-switch processing might continue until after the deadline.

(NONE)

Specifies that there is no deadline for the read-only iteration of log processing.

(timestamp)

Specifies the deadline by which the user wants the switch phase to start processing. This deadline must not have been reached when ALTER UTILITY executes. For more information on the format for specifying a timestamp, see the discussion of data types in *SQL Reference*.

MAXRO

Specifies the maximum amount of time that is tolerated for the last iteration of log processing during reorganization. During that iteration, applications have read-only access.

The actual execution time of the last iteration can exceed the value specified for MAXRO.

(integer)

Is the number of *seconds*. The default is the most recently specified value of MAXRO.

(DEFER)

Specifies that the log phase is deferred indefinitely.

LONGLOG

Specifies the action that DB2 performs (after sending the LONGLOG message to the console) if the number of log records that are processed during the next iteration is not sufficiently lower than the number of log records that were processed during the previous iterations. The default is the most recently specified value of LONGLOG.

(CONTINUE)

Specifies that DB2 continues performing reorganization.

(TERM)

Specifies that DB2 terminates reorganization after the delay.

(DRAIN)

Specifies that DB2 drains the write claim class after the delay. The number of log records, and thus the *estimated* time, for a future iteration of log processing will be 0.

| **DELAY** *integer*

| Specifies a lower bound for the interval between the time when REORG sends
| the LONGLOG message to the console and the time when REORG performs
| the action specified by the LONGLOG parameter.

| *integer* is the number of *seconds*. The value must be nonnegative. The default
| is the most recently specified value of DELAY.

| **Usage Note**

| REORG can be altered only from the DB2 on which it is running.

| **Example**

| **Example:** The following example alters the execution of the REORG utility for the
| utility job step whose utility identifier is REORGEMP:

- MAXRO(240) changes the maximum tolerable time for the last iteration of log processing to 240 seconds (4 minutes).
- LONGLOG DRAIN changes the action that DB2 performs (if reorganization's reading of the log is not catching up to applications' writing of the log quickly enough) to draining of the write claim class.
- DELAY was not specified and therefore, the example does not change the existing delay between sending of the LONGLOG message to the console and performing the action specified by LONGLOG.
- DEADLINE was not specified and the example does not change the existing deadline (if any) of the last iteration of log processing.

-ALTER UTILITY (REORGEMP) REORG MAXRO(240) LONGLOG DRAIN

-ARCHIVE LOG (DB2)

When issued without any options, the DB2 command ARCHIVE LOG performs the following functions:

- Truncates the current active log data sets
- Starts an asynchronous task to off-load the data sets
- Archives previous active log data sets not yet archived
- Returns control to the user (immediately)

In a data sharing environment, you can truncate and archive the logs for an individual member or for all members in the group.

When specified with the option MODE(QUIESCE), the ARCHIVE LOG command attempts to quiesce (suspend) all DB2 user update activity on the DB2 active log prior to the off-load process. Once a system-wide point of consistency is reached (that is, when all currently active update users have reached a commit point), the active log is immediately truncated, and the off-load process is initiated. The resulting point of consistency is captured in the current active log before it is off-loaded. In a data sharing environment, you can create a system-wide point of consistency only for the entire group.

For further information regarding the ARCHIVE LOG command, see Section 4 (Volume 1) of *Administration Guide*.

Abbreviation: -ARC LOG

Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

The ARCHIVE LOG command can also be issued from the MVS subsystem interface (SSI) to enable automated scheduling systems and other programs to execute the command via supervisor call instruction (SVC) 34.

Data Sharing Scope: Group or member, depending on whether you specify MODE(QUIESCE), or on which SCOPE option you choose

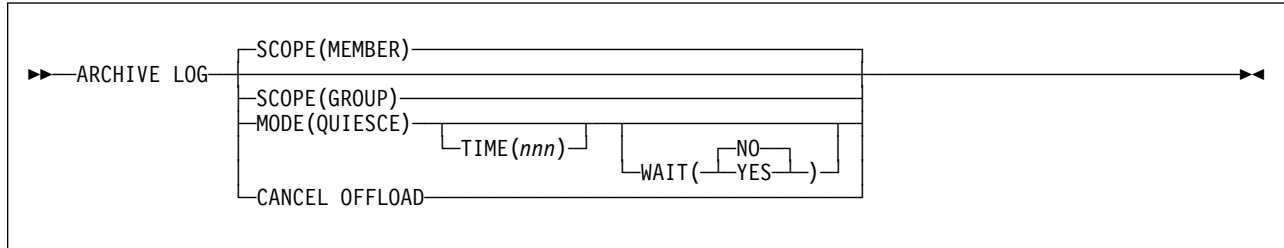
Authorization

To execute this command, the privilege set of this process must include one of the following:

- ARCHIVE privilege
- Installation SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

Syntax



Option Descriptions

SCOPE

Specifies whether the command applies to the entire data sharing group or to a single member only. The SCOPE option is valid only in a data sharing environment; the option is ignored in a non-data-sharing environment. SCOPE cannot be specified if MODE(QUIESCE) is specified; the two keywords are mutually exclusive.

(MEMBER)

Initiates off-load processing only for the member from which the command is issued. User update activity is not suspended. If that member, or the entire group, is already archiving, the command fails. This is the default, except when MODE(QUIESCE) is specified.

(GROUP)

Initiates off-load processing for every member of the DB2 group. User update activity is not suspended. If any member of the group, or the entire group, is already archiving, the command fails.

MODE(QUIESCE)

Halts all new update activity by the DB2 subsystem for a specified period of time and attempts to bring all existing users to a point of consistency after a commit or rollback. When a point of consistency is reached and captured in the current active log data set, the current active log data set is truncated, and another log data set in the inventory becomes current. Off-load processing then begins with the oldest active log data set and ends with the active log data set that was truncated.

In a data sharing environment, before archiving logs of any member, the option quiescs all active members of a data sharing group. The option also ensures that each inactive member had successfully quiesced its update activity and resolved any indoubt units of recovery (URs) before the inactive subsystem completed normal termination. If any DB2 is in a failed state, fails during quiesce processing, or is stopped with outstanding URs, the ARCHIVE LOG command fails, and the remaining active members allow update activity to proceed.

If there are no indoubt URs left on all quiesced members, active or inactive, the archive operation can continue for active members in the group. Thus, you can archive logs of a data sharing group normally without forcing all members to be active. The current logs of inactive members are truncated and off-loaded after they start up.

-ARCHIVE LOG (DB2)

If a system-wide point of consistency cannot be reached during the quiesce period, which is a length of time you can control, execution of the ARCHIVE LOG command fails and an error message is issued. In a data sharing environment, the maximum time period applies for the whole group, and if any DB2 cannot quiesce within the time allowed, the command fails.

If you do not use the TIME option to specify the quiesce time period, the default is the value specified in the field QUIESCE PERIOD of installation panel DSNTIPA.

If there is no update activity on DB2 data when the command ARCHIVE LOG MODE(QUIESCE) is issued, the active log is truncated and off-loaded immediately.

TIME(*nnn*)

Specifies the maximum length of time, in seconds, in which the DB2 subsystem is allowed to attempt a full system quiesce.

The **default** is the period specified in the field QUIESCE PERIOD of installation panel DSNTIPA. See Section 2 of *Installation Guide* for more information on this field.

nnn can range from 001 to 999 seconds. You must allocate an appropriate time period for the quiesce processing or the following events can occur:

- The quiesce processing can expire before a full quiesce is accomplished.
- An unnecessary DB2 lock contention can be imposed.
- A time-out can occur.

This option is valid only when used in conjunction with the option MODE(QUIESCE).

WAIT

Specifies whether the DB2 subsystem should wait until the quiesce processing has completed before returning control to the invoking console or program, or return control when the quiesce processing begins.

This option is valid only when used in conjunction with the option MODE(QUIESCE). The **default** is **WAIT(NO)**.

(YES)

Specifies that the quiesce processing must complete before returning control to the invoking console or program.

If WAIT(YES) is used, quiesce processing is synchronous to the user; that is, additional DB2 commands can be issued, but they are not processed by the DB2 command processor until the ARCHIVE LOG command is complete.

(NO)

Specifies that control must be returned to the invoking program when the quiesce processing begins.

If WAIT(NO) is used, quiesce processing is asynchronous to the user; that is, you can enter additional DB2 commands once the ARCHIVE LOG command returns control to you.

CANCEL OFFLOAD

Cancels any off-loading currently in progress and restarts the off-load process, beginning with the oldest active log data set that has not been off-loaded and proceeding through all active log data sets that need off-loading. Any suspended off-load operations are restarted.

Usage Notes

Remote Site Recovery: The ARCHIVE LOG command is very useful when performing a DB2 backup in preparation for a remote site recovery. For example, the command allows the DB2 subsystem to quiesce all users after a commit point, and capture the resulting point of consistency in the current active log *before* the archive is taken. Therefore, when the archive log is used with the most current image copy (during an offsite recovery), the number of data inconsistencies will be minimized. See Section 4 (Volume 1) of *Administration Guide* for additional information on backup and recovery.

Simultaneous Executions: The ARCHIVE LOG command cannot be executed if another ARCHIVE LOG command is in progress. Instead, error message DSNJ318I is issued and the command fails. This is true in both data sharing and non-data-sharing environments. For example in a data sharing environment, the command fails if the data sharing member, or group to which it belongs, is already archiving.

Available Active Log Space: -ARCHIVE LOG cannot be used when the current active log is the last available active log data set because of the following reasons:

- All available active log space would be used.
- The DB2 subsystem would halt processing until an off-load is complete.

Executing -ARCHIVE LOG While STOP DB2 Is in Progress: -ARCHIVE LOG without the option MODE(QUIESCE) is permitted when STOP DB2 MODE(QUIESCE) is in progress. However, if an attempt is made to execute the ARCHIVE LOG command when a STOP DB2 MODE(FORCE) is in progress, error message DSNJ315I is issued and the ARCHIVE LOG command is not processed.

-ARCHIVE LOG with the option MODE(QUIESCE) is not allowed when a STOP DB2 MODE(FORCE) or STOP DB2 MODE(QUIESCE) is in progress. If an attempt is made to execute the ARCHIVE LOG command under these circumstances, error message DSNJ315I or DSNJ316I is issued.

If the system was not fully quiesced (as determined by the number of users which could not be quiesced), error message DSNJ317I is issued and ARCHIVE LOG command processing is terminated. The current active log data set is not truncated and switched to the next available active log data set and the archive log is not created.

Canceling Log Off-loads: It is possible for the off-load of an active log to be suspended when something goes wrong with the off-load process, such as a problem with allocation or tape mounting. Issuing ARCHIVE LOG CANCEL OFFLOAD interrupts the off-load process and restarts the off-load. The command causes an abnormal termination of the off-load task, which can result in a dump. We recommend using ARCHIVE LOG CANCEL OFFLOAD only if the off-load task no longer seems to be functioning or if you want to restart a previous off-load attempt that failed.

-ARCHIVE LOG (DB2)

Demand upon DB2 Resources: Using the option MODE(QUIESCE) during prime time or during a period in which time is critical causes a significant disruption in the availability of DB2 for all users of DB2 resources.

Interaction with -DISPLAY THREAD: By issuing message DSNV400I, the command DISPLAY THREAD indicates that an ARCHIVE LOG MODE(QUIESCE) command is active.

Quiescing Members of a Data Sharing Group: It is not possible to quiesce a single member of a data sharing group. When MODE(QUIESCE) is specified, SCOPE(GROUP) is assumed.

Examples

Example 1: Truncate the current active log data sets and initiate an asynchronous job to off-load the truncated data sets. No quiesce processing occurs.

```
-ARCHIVE LOG
```

Example 2: Initiate a quiesce period. If all DB2 update activity is stopped within this period, truncate the current active log data set and switch to the next available active log data set. Let the value in the field QUIESCE PERIOD of installation panel DSNTIPA determine the length of the quiesce period. The MODE(QUIESCE) processing is asynchronous.

If the DB2 subsystem can successfully block all update activity before the quiesce period ends, it proceeds to the next processing step. If the quiesce time period is insufficient to successfully quiesce the DB2 subsystem, the active log data sets are not truncated and the archive does not occur.

```
-ARCHIVE LOG MODE(QUIESCE)
```

Example 3: Initiate a quiesce period. If all DB2 update activity is stopped within this period, truncate the current active log data set and switch to the next available active log data set. The maximum length of the quiesce processing period is seven minutes (420 seconds) and the processing is synchronous for the entire seven minutes.

If the DB2 subsystem can successfully block all update activity before the quiesce period ends, it proceeds to the next processing step. If the quiesce time period is insufficient to successfully quiesce the DB2 subsystem, the active log data sets are not truncated and the archive does not occur.

```
-ARCHIVE LOG MODE(QUIESCE) WAIT(YES) TIME(420)
```

Example 4: In a data sharing environment, initiate a quiesce period for all members of the data sharing group. If all DB2 update activity is stopped within this period, truncate the current active log data set and switch to the next available active log data set. Specify a quiesce time period of 10 minutes (600 seconds) to override the value in the field QUIESCE PERIOD of installation panel DSNTIPA for member DB1G. If the update activity has not quiesced after the 10 minute quiesce period, the command fails and new update activity is allowed to proceed.

```
-DB1G ARCHIVE LOG MODE(QUIESCE) TIME(600)
```

Example 5: In a data sharing environment, truncate the active log data sets for group member DB2G and initiate an asynchronous job to off-load the truncated

data sets, without any quiesce processing. In this example, SCOPE(MEMBER) is used by default.

```
-DB2G ARCHIVE LOG
```

Example 6: In a data sharing environment, truncate the data sets for all members of the data sharing group and initiate an asynchronous job to off-load the truncated data sets, without any quiesce processing.

```
-DB2G ARCHIVE LOG SCOPE(GROUP)
```

BIND PACKAGE (DSN)

The DSN subcommand BIND PACKAGE builds an application package. DB2 records the description of the package in the catalog tables and saves the prepared package in the directory. For more information on using BIND PACKAGE, see Section 5 of *Application Programming and SQL Guide*.

Environment

You can use BIND PACKAGE from DB2I, or from a DSN session under TSO that runs in either the foreground or background.

Data Sharing Scope: Group

Authorization

The package owner must have authorization to execute *all* statements embedded in the package for BIND PACKAGE to build a package without producing error messages. (The SYSADM authority includes this authorization.) For VALIDATE(BIND), DB2 verifies the authorization at bind time. For VALIDATE(RUN), DB2 verifies the authorization initially at bind time, but if the authorization check fails, DB2 rechecks it at run time.

The authorization required to add a new package or a new version of an existing package depends on the value of field BIND NEW PACKAGE on installation panel DSNTIPP. The default value is BINDADD.

Table 8 summarizes the authorization required to run BIND PACKAGE, depending on the bind options you specify, and in the case of the ADD option, the value of field BIND NEW PACKAGE.

Table 8 (Page 1 of 3). Summary of Privileges Needed for BIND PACKAGE Options

Bind Option	Installation Panel Field BIND NEW PACKAGE	Authorization Required to Run BIND PACKAGE
ADD, using the default owner or primary authorization ID	BINDADD	<p>The primary authorization ID (default owner) must have one of the following to add a new package or new version of an existing package to a collection:</p> <ul style="list-style-type: none"> The BINDADD system privilege and either the CREATE IN privilege or PACKADM authority on the collection or on all collections SYSADM or SYSCTRL authority
	BIND	<p>The primary authorization ID (default owner) must have one of the following to add a new package or a new version of an existing package to a collection:</p> <ul style="list-style-type: none"> The BINDADD system privilege and either the CREATE IN privilege or PACKADM authority on the collection or on all collections SYSADM or SYSCTRL authority PACKADM authority on the collection or on all collections The BIND package privilege (can only add a new version of an existing package)

Table 8 (Page 2 of 3). Summary of Privileges Needed for BIND PACKAGE Options

Bind Option	Installation Panel Field BIND NEW PACKAGE	Authorization Required to Run BIND PACKAGE
ADD, specifying an OWNER other than the primary authorization ID	BINDADD	<p>If the binder does not have SYSADM or SYSCTRL authority, the authorization ID of the OWNER must have one of the following to add a new package or new version of an existing package to a collection:</p> <ul style="list-style-type: none"> • The BINDADD system privilege and either the CREATE IN privilege or PACKADM authority on the collection or on all collections • SYSADM or SYSCTRL authority
	BIND	<p>If the binder does not have SYSADM or SYSCTRL authority, the authorization ID of the OWNER must have one of the following to add a new package or new version of an existing package to a collection:</p> <ul style="list-style-type: none"> • The BINDADD system privilege and either the CREATE IN privilege or PACKADM authority on the collection or on all collections • SYSADM or SYSCTRL authority • PACKADM authority on the collection or on all collections • The BIND package privilege (can only add a new version of an existing package) <p>Specifying the OWNER: If any of the authorization IDs of the process has the SYSADM authority or SYSCTRL authority, OWNER <i>authorization-id</i> can be any value. If any of the authorization IDs has the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, the OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder.</p>
REPLACE, using the default owner or primary authorization ID	BINDADD or BIND	<p>Primary authorization ID must have one of the following:</p> <ul style="list-style-type: none"> • Ownership of the package • BIND privilege on the package • PACKADM authority on the collection or on all collections • SYSADM or SYSCTRL authority
		<p>If the binder does not have SYSADM or SYSCTRL authority, the authorization ID of the OWNER must have one of the following:</p> <ul style="list-style-type: none"> • BIND privilege on the package • PACKADM authority on the collection or on all collections • SYSADM or SYSCTRL authority <p>Specifying the OWNER: If any of the authorization IDs of the process has the SYSADM authority or SYSCTRL authority, OWNER <i>authorization-id</i> can be any value. If any of the authorization IDs has the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder.</p>

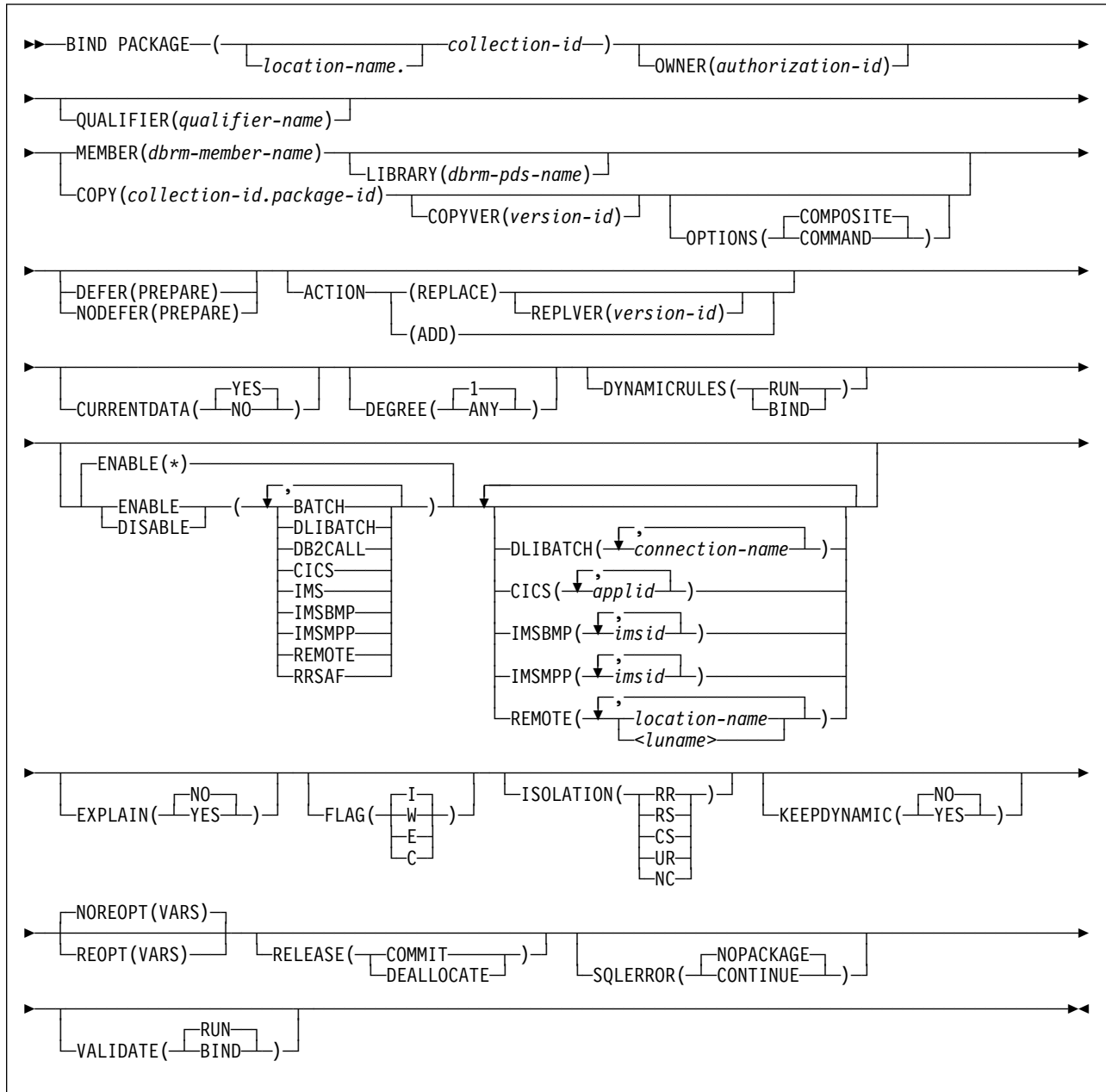
BIND PACKAGE (DSN)

Table 8 (Page 3 of 3). Summary of Privileges Needed for BIND PACKAGE Options

Bind Option	Installation Panel Field BIND NEW PACKAGE	Authorization Required to Run BIND PACKAGE
COPY	BINDADD or BIND	The primary or secondary authorization ID of the binder or OWNER must have one of the following on the package being copied: <ul style="list-style-type: none">• Ownership of the package• COPY privilege on the package• BINDAGENT privilege from the owner of the package• PACKADM authority on the collection or on all collections• SYSADM or SYSCTRL authority

For additional information on the authorization required to execute BIND PLAN see Section 5 (Volume 2) of *Administration Guide*.

Syntax



Option Descriptions

For descriptions of the options shown in the syntax diagram, see “Options of BIND and REBIND for PLAN and PACKAGE” on page 56.

Example

Example 1: Replace version APRIL_VERSION of package TEST.DSN8BC51 at local location USIBMSTODB22 with another version of the package. The new version (or it could be the same) is in the DBRM DSN8BC51. If the DBRM contains no version ID, the version ID of the package defaults to the empty string. The package runs only from the TSO BATCH environment, and from the CICS environment if the connection ID is CON1. The name PRODUCTN qualifies all unqualified table, view, alias and index names.

```
BIND PACKAGE (USIBMSTODB22.TEST) -  
  MEMBER (DSN8BC51) -  
  ACTION (REPLACE) REPLVER (APRIL_VERSION) -  
  QUALIFIER (PRODUCTN) -  
  ENABLE (BATCH, CICS) CICS (CON1)
```

Example 2: UR isolation acquires almost no locks. It is fast and causes little contention, but it reads uncommitted data. Do not use ISOLATION(UR) unless you are sure that your applications and end users can accept the logically inconsistent data that can occur, such as in the case of this example.

Assume that a supervisor routinely executes SQL statements using SPUFI to check the status of parts as they go through the assembly process and to update a table with the results of her inspection. She does not need to know the exact status of the parts; a small margin of error is acceptable.

The supervisor queries the status of the parts from a production table called ASSEMBLY-STATUS and makes the updates in a non-production table called REPORTS. She uses the SPUFI option AUTOCOMMIT NO and has the habit of leaving data on the screen while she performs other tasks.

If the supervisor executes a version of SPUFI that is bound with ISOLATION(UR), the query for the status of the parts executes without acquiring locks using UR isolation level and the update executes using CS isolation level. Thus, the query does not inadvertently hold locks in the production table interfering with the production jobs, and the supervisor has data good enough for her purposes.

The SPUFI application is bound as follows:

```
BIND PACKAGE(DSNESPUR) -  
  COPY(DSNESPCS.DSNESM68) -  
  ACTION(ADD) -  
  ISOLATION(UR)
```


BIND PLAN (DSN)

The DSN subcommand BIND PLAN builds an application plan. All DB2 programs require an application plan to allocate DB2 resources and support SQL requests made at run time. For more information on using BIND PLAN, see Section 5 of *Application Programming and SQL Guide*.

Environment

You can use BIND PLAN through DB2I, or from a DSN session under TSO that runs in either the foreground or background.

Data Sharing Scope: Group

Authorization

The plan owner must have authorization to execute *all* SQL statements embedded in the plan¹ for BIND PLAN to build a plan without producing error messages. (The SYSADM authority includes this authorization.) For VALIDATE(BIND), DB2 verifies the authorization at bind time. For VALIDATE(RUN), DB2 verifies the authorization initially at bind time, but if the authorization check fails, DB2 rechecks it at run time.

Table 9 explains the authorization required to run BIND PLAN, depending on the options specified.

Table 9 (Page 1 of 2). Summary of Privileges Needed for BIND PLAN Options

Option	Authorization Required to Run BIND PLAN
ADD, using the default owner or primary authorization ID	<p>Primary authorization ID (default owner) must have one of the following:</p> <ul style="list-style-type: none"> • BINDADD privilege • SYSADM or SYSCTRL authority
ADD, specifying an OWNER other than the primary authorization ID	<p>If the binder does not have SYSADM or SYSCTRL authority, the authorization ID of the new OWNER must have one of the following:</p> <ul style="list-style-type: none"> • BINDADD privilege • SYSADM or SYSCTRL authority <p>Specifying the OWNER: If any of the authorization IDs of the process has the SYSADM authority or SYSCTRL authority, OWNER <i>authorization-id</i> can be any value. If any of the authorization IDs has the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder.</p>
REPLACE, using the default owner or primary authorization ID	<p>Primary authorization ID of the process must have one of the following:</p> <ul style="list-style-type: none"> • Ownership of the plan • BIND privilege on the plan • SYSADM or SYSCTRL authority

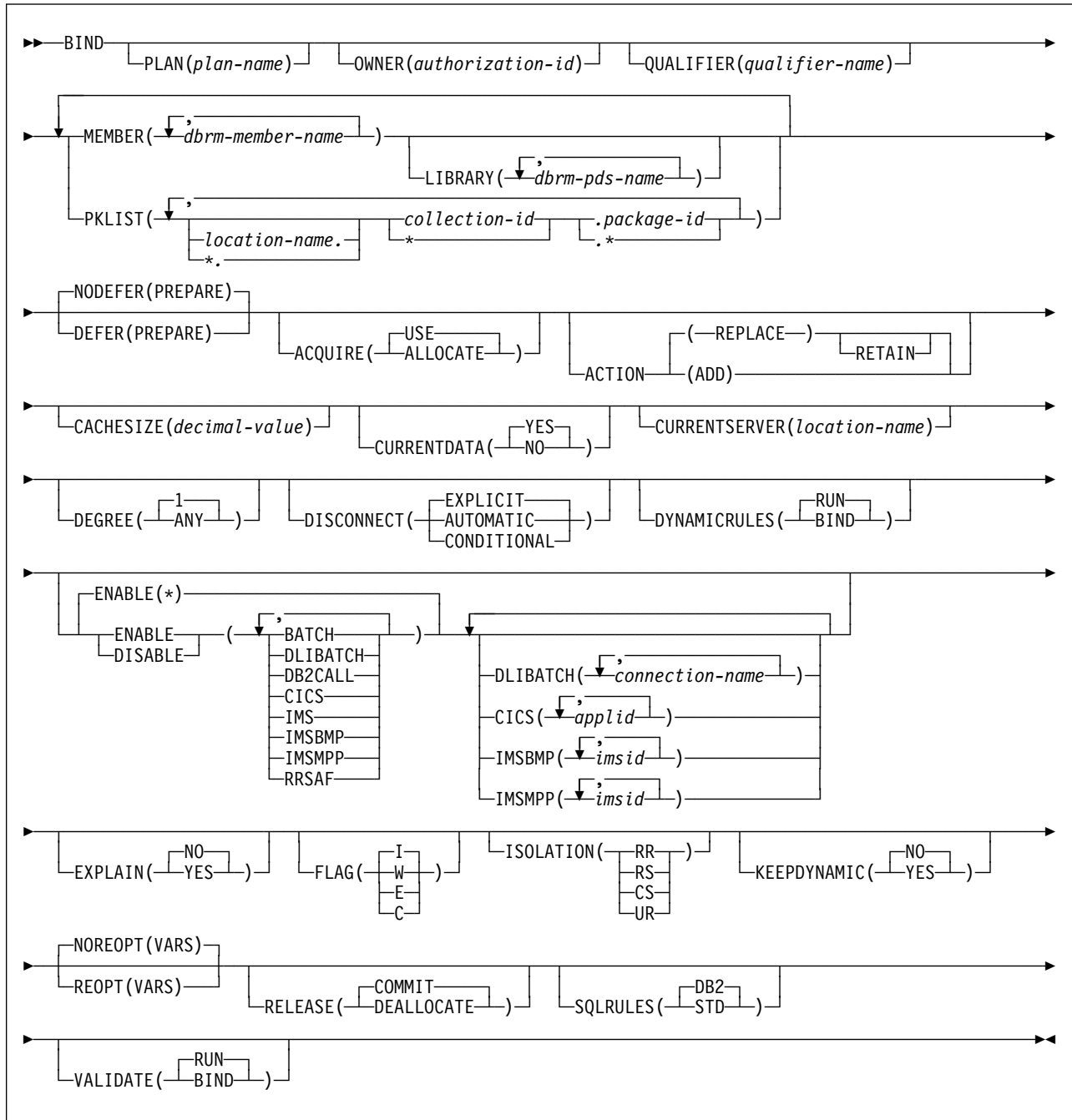
¹ This excludes statements included in DBRMs that are bound to packages included in the package list of the plan.

Table 9 (Page 2 of 2). Summary of Privileges Needed for BIND PLAN Options

Option	Authorization Required to Run BIND PLAN
REPLACE, specifying an OWNER other than the primary authorization ID	<p>If the binder does not have SYSADM or SYSCTRL authority, the authorization ID of the OWNER must have one of the following:</p> <ul style="list-style-type: none"> • Ownership of the plan • BIND privilege on the plan • SYSADM or SYSCTRL authority <p>Specifying the OWNER: If any of the authorization IDs of the process has the SYSADM authority or SYSCTRL authority, OWNER <i>authorization-id</i> can be any value. If any of the authorization IDs has the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder.</p>
PKLIST, specifying individual packages	<p>Authorization ID of the process must include one of the following:</p> <ul style="list-style-type: none"> • EXECUTE authority on each package specified in the PKLIST • PACKADM authority on specific collections that contain the packages or on all collections • SYSADM authority
PKLIST, specifying (*), indicating all packages in the collection	<p>Authorization ID of the process must include one of the following:</p> <ul style="list-style-type: none"> • EXECUTE authority on <i>collection-id</i>* • PACKADM authority on specific collections that contain the packages or on all collections • SYSADM authority

For additional information on the authorization required to execute BIND PLAN see Section 5 (Volume 2) of *Administration Guide*.

Syntax



Option Descriptions

For descriptions of the options shown in the syntax diagram, see “Options of BIND and REBIND for PLAN and PACKAGE” on page 56.

Examples

Example 1: This subcommand creates a new plan called IMSONLY. The SQL statements for the plan are in the DBRM member DSN8BC51. An ISOLATION level of cursor stability (CS) provides maximum concurrency when you run the plan, and protects database values only while the program uses them. DEPTM92 owns the plan, but PRODUCTN qualifies any unqualified table, view, index, and alias names referenced in the DBRM.

A cache size of 0 indicates that users will not run the plan repeatedly. Caching the names of users authorized to run the plan helps only when the same user runs the plan repeatedly while it is in the EDM pool. Since this is not the case with this plan, there is no need to reserve space in the EDM pool for a cache that the plan does not use.

The option ENABLE(IMS) runs the plan only from an IMS environment (DLI Batch, BMP and MPP). If you attempt to run the plan from another environment, such as TSO Batch, the plan allocation fails.

```
BIND PLAN(IMSONLY) -  
  MEMBER(DSN8BC51) -  
  ACTION(ADD) -  
  ISOLATION(CS) -  
  OWNER(DEPTM92) -  
  QUALIFIER(PRODUCTN) -  
  CACHESIZE -  
  ENABLE(IMS)
```

Example 2: If the DBRM of plan IMSONLY in example 1 contains both embedded and dynamic SQL statements and you want to allow other users to run the plan, you must grant the EXECUTE privilege on plan IMSONLY to those users' authorization IDs. However, because the EXECUTE privilege on a plan is sufficient authority to run embedded SQL statements in a DBRM but is not sufficient authority to run dynamic SQL statements, you must also do one of the following:

- Use the SQL GRANT statement to grant the necessary privileges on the objects (tables, views, aliases, and indexes) referenced in the dynamic SQL statements to the users' authorization IDs, or
- BIND the plan IMSONLY with the option DYNAMICRULES(BIND) as follows:

```
BIND PLAN(IMSONLY) -  
  MEMBER(DSN8BC51) -  
  ACTION(ADD) -  
  ISOLATION(CS) -  
  OWNER(DEPTM92) -  
  QUALIFIER(PRODUCTN) -  
  CACHESIZE(0) -  
  ENABLE(IMS) -  
  DYNAMICRULES(BIND)
```

To allow other users having only the EXECUTE privilege on a plan to run both the embedded and dynamic SQL statements, you must bind that plan with the option DYNAMICRULES(BIND). When DYNAMICRULES(BIND) is in effect for plan IMSONLY:

- A single authorization ID, the authorization ID for DEPTM92, is used for authorization checking of both the embedded and dynamic SQL statements in the DBRM.
- PRODUCTN is the implicit qualifier of unqualified object names referenced in both the embedded and dynamic SQL statements in the DBRM.

Example 3: This subcommand creates a new plan called CICSONLY. The plan specifies an ISOLATION level of cursor stability (CS). DEPTM12 owns the plan, but TESTSYS qualifies any unqualified table, view, index, and alias names referenced in the DBRM. A cache size of 0 indicates that users will not run the plan repeatedly.

The option ENABLE(CICS) CICS(CON1) runs the plan only from CICS VTAM node CON1 which is specified in the APPLID parameter of the CICS SIT table. If you attempt to run the plan from another environment or from another CICS VTAM node, the run attempt fails.

```
BIND PLAN(CICSONLY) -  
  MEMBER(DSN8BC51) -  
  ACTION(ADD) -  
  ISOLATION(CS) -  
  OWNER(DEPTM12) -  
  QUALIFIER(TESTSYS) -  
  CACHESIZE(0) -  
  ENABLE(CICS) CICS(CON1)
```

Options of BIND and REBIND for PLAN and PACKAGE

This section lists the options you can use for binding or rebinding plans and packages. Some of them are common for both bind and rebind and both plans and packages.

Defaults: The *default* for an option is the value used if you omit the entire option.

A default of *plan value* for BIND PACKAGE means that the default is the same as the value determined during the bind or rebind of the plan to which the package is appended at run time.

A default of *existing value* for REBIND PLAN or REBIND PACKAGE means that the default is the value that was determined during the previous bind or rebind of the plan or package you are rebinding.

For all other cases, the option descriptions note the specific defaults, which DB2 assigns at bind time. If a specific default value exists, that value is underlined.

Catalog Records: The DB2 catalog records information about plans and packages, chiefly in the tables SYSIBM.SYSPLAN and SYSIBM.SYSPACKAGE. The descriptions of where the options record information omit the constant qualifier, SYSIBM, of those table names.

ACQUIRE	<u>(USE)</u> (ALLOCATE)	On: BIND and REBIND PLAN
---------	----------------------------	--------------------------

Determines whether to acquire resources for DBRMs specified in the MEMBER list when the application first accesses them or when the plan is allocated. Local or remote packages associated with the plan acquire their resources when the application first accesses them.

(USE)

Acquires table space locks only when the application program bound to the plan first uses them.

(ALLOCATE)

Acquires all table space locks when the plan is allocated. The value has no effect on dynamic SQL statements, which always use ACQUIRE(USE).

If you use ACQUIRE(ALLOCATE), you must also use RELEASE(DEALLOCATE). ACQUIRE(ALLOCATE) can increase the plan size, because additional items become resident in the plan.

Defaults:

Process	Default value
BIND PLAN	USE
BIND PACKAGE	n/a
REBIND PLAN	existing value
REBIND PACKAGE	n/a

There is no ACQUIRE option for packages. A packages always acquires resources when it first uses them, as if you specified ACQUIRE(USE). See Section 5 (Volume 2) of *Administration Guide*.

Catalog Record: Column ACQUIRE of table SYSPLAN.

For more information about:

- How the option affects locking and concurrency, see Section 5 (Volume 2) of *Administration Guide* or Section 4 of *Application Programming and SQL Guide*.
- How the option improves the performance of selective partition locking, see Section 5 (Volume 2) of *Administration Guide* or Section 4 of *Application Programming and SQL Guide*.
- Estimating the size of a plan, see Section 2 of *Administration Guide*.

ACTION	(REPLACE) (REPLACE) RPLVER (BIND PACKAGE only) (REPLACE) RETAIN (BIND PLAN only) (ADD)	On: BIND PLAN and PACKAGE
---------------	-----------------------------------------------------------------------------------------------------------------------------	----------------------------------

Determines whether the object (plan or package) replaces an existing object with the same name or is new.

(REPLACE)

The object replaces an existing one with the same identifier, and a new entry replaces the old one in the catalog table SYSPLAN or SYSPACKAGE. If no object with the given identifier already exists, the bind process creates the new object and a new entry.

The authorization ID designated explicitly or implicitly by the option OWNER becomes the owner of the new object. If that authorization ID is not the previous owner, all grants of privileges for the object that the previous owner issued change to name the new owner as the grantor.

If the bind fails, the old object and its entry remain.

For BIND PACKAGE: You cannot use REPLACE with a remote package bound with either of the options ENABLE or DISABLE. The attempt causes the bind to fail.

REPLVER(*version-id*) (For BIND PACKAGE only)

Replaces a specific version of the package, identified by *version-id*. If the package with the specified *version-id* does not exist, the bind fails.

The default for *version-id* comes from the DBRM if you use the MEMBER option on BIND, or from the COPYVER option if you use the COPY option.

RETAIN (For BIND PLAN only)

Preserves EXECUTE privileges when you replace the plan. If ownership of the plan changes, the new owner grants the privileges BIND and EXECUTE to the previous owner.

RETAIN is *not* the default. If you do not specify RETAIN, everyone but the plan owner loses the EXECUTE privilege (but not the BIND privilege). If plan ownership changes, the new owner grants the BIND privilege to the previous owner.

(ADD)

Adds a new object, but does not replace an existing one. If the object name already exists in the catalog, the bind fails. If the bind fails for any reason, the bind process does not produce a new package or plan and makes no entry in the catalog.

Bind Options: CACHESIZE

Replacing a Version of a Package (REPLVER): This section describes the effect of ACTION(REPLACE) REPLVER in four situations. Here, DBRM1 is the member name and A and B represent the names of two versions of the package. Suppose you bind version A with this command:

```
BIND PACKAGE(COLL1) MEMBER(DBRM1) ACTION(REPLACE) REPLVER(B)
```

- If neither DBRM1, version A, nor version B exist in the DB2 catalog, the command fails because version B is not in the catalog. No new package is added.
- If DBRM1 and version B, but not version A, exist in the DB2 catalog, then version A replaces version B. As a result, version A exists in the catalog, and version B no longer exists in the catalog.
- If DBRM1 and version A exist in the catalog, but not version B, the command fails because version B is not in the catalog. Version A continues to exist.
- If DBRM1 and both versions A and B exist in the catalog, the command fails because version A already exists.

Defaults:

Process	Default value
BIND PLAN	REPLACE
BIND PACKAGE	REPLACE
REBIND PLAN	n/a
REBIND PACKAGE	n/a

Catalog Record: Tables SYSPLAN or SYSPACKAGE.

CACHESIZE	(value of field PLAN AUTH CACHE) (decimal-value)	On: BIND and REBIND PLAN
------------------	-----------------------------------------------------	---------------------------------

Determines the size (in bytes) of the authorization cache acquired in the EDM pool for the plan. At run time, the authorization cache stores user IDs authorized to run. Consulting the cache can avoid a catalog lookup for checking authorization to run the plan.

decimal-value

The size of the cache can range from 0 to 4096. Nonzero values that are not multiples of 256 round to the next highest multiple of 256. CACHESIZE(0) specifies creating no cache when the plan runs.

Defaults:

Process	Default value
BIND PLAN	value of field PLAN AUTH CACHE on installation panel DSNTIPP, which has a default of 0
BIND PACKAGE	n/a
REBIND PLAN	existing value
REBIND PACKAGE	n/a

Catalog Record: Column CACHESIZE of table SYSPLAN.

For additional information on determining an optimal cache size, see Section 5 of *Application Programming and SQL Guide*.

COPY	<i>(collection-id.package-id)</i> <i>(collection-id.package-id)</i> COPYVER	On: BIND PACKAGE
-------------	---------------------------------------------------------------------------------------	-------------------------

Determines that you are copying an existing package and names that package. Copying the package recalculates the access paths in the copy.

To create a remote copy, this option copies SQL statements from a package at your local server. Therefore, you must hold the COPY privilege or its equivalent at the **local** server.

collection-id.

The name of the collection that contains the package to copy, as listed in column COLLID of catalog table SYSPACKAGE.

package-id

The name of the package to copy, as listed in column NAME of catalog table SYSPACKAGE.

COPYVER(*version-id*)

Determines the version of the package to copy. The default for *version-id* is the empty string.

Restrictions:

- *collection-id.package-id* must identify a package on the local server.
- You cannot copy to a package in the same collection. If you make the copy on the local server, *collection-id.* on the COPY option must not name the collection used on the PACKAGE option.

Defaults:

Process	Default value
BIND PLAN	n/a
BIND PACKAGE	none
REBIND PLAN	n/a
REBIND PACKAGE	n/a

COPY has *no default*. If you do not use COPY, you must use MEMBER. You cannot use both options.

The option values of the package copied (**except** the values of ENABLE, DISABLE, OWNER, and QUALIFIER) become the defaults for binding the new package. You can override a default by choosing a new value for an option on the BIND PACKAGE command.

Copy Packages to Remote Servers: To copy and bind packages from DB2 Version 5 to some other server that does not support all the new BIND options in Version 5, use the new OPTIONS(COMMAND) option on BIND PACKAGE COPY. Any options you do not explicitly specify on the BIND PACKAGE subcommand are set to the server's defaults. Using this option can prevent bind errors when you bind and copy packages to servers other than DB2 Version 5.

Bind Options: CURRENTSERVER

Catalog Record: Column COPY of table SYSPACKAGE.

CURRENTDATA	(YES) (NO)	On: BIND and REBIND PLAN and PACKAGE
-------------	---------------	-----------------------------------------

Determines whether to require data currency for read-only and ambiguous cursors when the isolation level of cursor stability is in effect. It also determines whether block fetching can be used for distributed, ambiguous cursors.

(YES) Specifies that currency is required for read-only and ambiguous cursors.

DB2 acquires page or row locks to ensure data currency. Block fetching for distributed, ambiguous cursors is inhibited.

(NO) Specifies that currency is not required for read-only and ambiguous cursors. Block fetching for distributed, ambiguous cursors is allowed.

If your application will be attempting to dynamically prepare and execute a DELETE WHERE CURRENT OF statement against an ambiguous cursor, after that cursor is opened, it is not recommended that you use CURRENTDATA(NO). You receive a negative SQLCODE if your application attempts a DELETE WHERE CURRENT OF statement for any of the following:

- A cursor that is using block fetching
- A cursor that is using query parallelism
- A cursor positioned on a row modified by this or another application process

Restriction for Remote Rebinds: You cannot use CURRENTDATA when rebinding a package at a remote server. To change the value of CURRENTDATA, you can:

- Issue BIND REPLACE, remotely or locally
- Free the package and issue BIND ADD, remotely or locally
- Rebind the package locally at the location where the package resides.

Defaults:

Process	Default value
BIND PLAN	YES
BIND PACKAGE	YES
REBIND PLAN	existing value
REBIND PACKAGE	existing value

Catalog Record: Column DEFERPREP of table SYSPACKAGE and column EXPREDICATE of table SYSPLAN.

For more information about updating the current row of a cursor, block fetching, and data currency, see Section 4 of *Application Programming and SQL Guide*.

CURRENTSERVER	(location-name)	On: BIND and REBIND PLAN
---------------	-----------------	--------------------------

Determines the location to connect to before running the plan. The column CURRENTSERVER in catalog table SYSPLAN records the value of *location-name*.

The special register CURRENT SERVER also receives that value at the server when the plan is allocated. When the plan runs, the requester implicitly uses a type 1 CONNECT statement to that location.

You should use CURRENTSERVER to cause a local application to use data from a remote server without changing the application. Avoid using CURRENTSERVER with applications that contain explicit CONNECT statements. The implicit type 1 CONNECT statement that is used by CURRENTSERVER causes any explicit CONNECT statement issued in the application to be type 1, even if the application was precompiled with the default type 2.

location-name

The name of the location to connect to. The catalog table SYSLOCATIONS must contain this name. If the table does not exist, if the table does not contain the DBMS, or if there are no packages at that location, warning messages occur.

SQL Return Codes: CURRENTSERVER causes DB2 to execute a type 1 CONNECT statement. DB2 does not display or report to the application program any warnings that this CONNECT returns. To display the warnings, use explicit CONNECT statements rather than the CURRENTSERVER bind option.

Defaults:

Process	Default value
BIND PLAN	local DBMS (regardless of the name of the local location)
BIND PACKAGE	n/a
REBIND PLAN	existing value
REBIND PACKAGE	n/a

Catalog Record: Column CURRENTSERVER of table SYSPLAN.

DEFER(PREPARE)
NODEFER(PREPARE)

On: BIND and REBIND PLAN and PACKAGE

Determines whether to defer preparation for dynamic SQL statements that refer to remote objects, or to prepare them immediately. If you defer preparation, the dynamic statement prepares when DB2 first encounters a statement of the type EXECUTE, OPEN, or DESCRIBE that refers to the dynamic statement.

For BIND and REBIND PACKAGE, if neither option is specified, and NOREOPT(VARS) applies:

- For local bind the package inherits the plan's option at runtime.
- For remote bind the default is NODEFER(PREPARE) at the remote DB2 server.

If neither DEFER nor NODEFER is specified and REOPT(VARS) applies, DEFER(PREPARE) is the default value.

You cannot use both DEFER(PREPARE) and NODEFER(PREPARE). In addition, you cannot use both NODEFER(PREPARE) and REOPT(VARS).

NODEFER(PREPARE)	Does not defer preparation.
DEFER(PREPARE)	Defers preparation.

Bind Options: DEGREE

DEFER(PREPARE) and Distributed Processing: To improve performance, consider using DEFER(PREPARE) when binding dynamic or static SQL for DB2 private protocol access and when binding dynamic SQL for DRDA access. Specify the bind option DEFER(PREPARE) instead of NODEFER(PREPARE). DB2 does not prepare the dynamic SQL statement until that statement executes. This reduces network traffic, which improves the performance of the dynamic SQL statement.

To defer the preparation of an SQL statement in an application, bind or rebind the application with the option DEFER(PREPARE). This defers PREPARE messages for SQL statements that refer to a remote object until either:

- The statement executes
- The application requests a description of the results of the statement

If you choose to defer PREPARE statements, after the EXECUTE or DESCRIBE statement, you should code your application to handle any SQL error codes or SQLSTATEs that the PREPARE statement might return. You can defer PREPARE statements only if you specify the bind option DEFER(PREPARE).

Defaults:

Process	Default value
BIND PLAN	NODEFER
BIND PACKAGE	plan value
REBIND PLAN	existing value
REBIND PACKAGE	existing value

Catalog Record: Column DEFERPREP of table SYSPLAN and column DEFERPREPARE of table SYSPACKAGE.

DEGREE	(1) (ANY)	On: BIND and REBIND PLAN and PACKAGE
---------------	--------------	---------------------------------------------

Determines whether to attempt to run a query using parallel processing to maximize performance.

For plans, the value of DEGREE applies only to the DBRMs bound directly to the plan (named in the MEMBER option on BIND PLAN), and has no effect on PKLIST names. The value has no effect on dynamic SQL statements, which use the value of the special register CURRENT DEGREE. The value of the special register can be changed by executing the SET CURRENT DEGREE statement.

- (1) Prohibits parallel processing.
(ANY) Allows parallel processing.

Limitation: If you bind plans or packages using DEGREE=ANY, the space required
in the EDM pool could increase by 50–70%.

Defaults:

Process	Default value
BIND PLAN	1
BIND PACKAGE	1
REBIND PLAN	existing value

REBIND PACKAGE existing value

Catalog Record: Column DEGREE of tables SYSPACKAGE and SYSPLAN.

DISCONNECT	(EXPLICIT) (AUTOMATIC) (CONDITIONAL)	On: BIND and REBIND PLAN
-------------------	-----------------------------------------------------------------	---------------------------------

Determines which remote connections to destroy during commit operations. The option applies to any application process that uses the plan and has remote connections of any type. Regardless of the value of this option, a commit operation destroys all connections in the release pending state. You can put a connection in the release pending state using the SQL statement RELEASE.

(EXPLICIT)

Destroy only connections in the release pending state. This value allows you maximum flexibility for controlling remote connections.

(AUTOMATIC)

Destroy all remote connections.

(CONDITIONAL)

Destroy all remote connections unless an open cursor defined as WITH HOLD is associated with the connection.

Defaults:

Process	Default value
BIND PLAN	EXPLICIT
BIND PACKAGE	n/a
REBIND PLAN	existing value
REBIND PACKAGE	n/a

Catalog Record: Column DISCONNECT of table SYSPLAN.

DYNAMICRULES	(RUN) (BIND)	On: BIND and REBIND PLAN and PACKAGE
---------------------	-------------------------------	---------------------------------------------

Determines what rules apply to dynamic SQL statements at run time for authorization checking and object qualification.

(RUN)

Processes dynamic SQL statements with the same rules used in prior releases of DB2. At run time, DB2 uses the authorization ID of the application process and the SQL authorization ID (the value of special register CURRENT SQLID) for authorization checking of dynamic SQL statements and implicit qualification of table, view, index, and alias names.

(BIND)

Processes dynamic SQL statements with the same rules used for embedded or static SQL statements. At run time, DB2 uses the authorization ID of the plan or package for authorization checking of dynamic SQL statements. Unqualified table, view, index, and alias names in dynamic SQL statements are implicitly qualified with value of the bind option QUALIFIER; if you do not specify QUALIFIER, DB2 uses the authorization ID of the plan or package owner as the implicit qualifier.

Bind Options: DYNAMICRULES

This does not affect the qualification of the EXPLAIN output PLAN_TABLE. Whether the option DYNAMICRULES(BIND) or DYNAMICRULES(RUN) is specified, DB2 uses the value in the special register CURRENT SQLID as the qualifier of the PLAN_TABLE.

By default, DB2 applies the precompiler options you specified to the dynamic SQL statements, instead of applying the corresponding application programming default values established at install time. To instead have DB2 apply the application programming default values to the dynamic SQL statements using DYNAMICRULES(BIND), you must re-assemble and re-linkedit the load module DSNHDECP with the DYNRULS=YES parameter as follows:

1. Create a separate job containing only the DSNTIZP and DSNTIZQ steps from the job DSNTIJUZ previously edited by the install CLIST.
2. Add the DYNRULS parameter to the DSNHDECM parameter list in step DSNTIZP. For example:

```
DYNRULS=YES, X
```

3. Run your newly-created job to reassemble and re-linkedit the DSNHDECP load module. This produces a new DSNHDECP containing the DYNRULS value.
4. Stop and restart DB2 to use this new DSNHDECP load module.
5. Verify that the other DSNHDECM parameters specified have the values that you previously established.

Restrictions with DYNAMICRULES(BIND): If you specify DYNAMICRULES(BIND), you cannot use the following SQL statements:

- The static or dynamic statement SET CURRENT SQLID
- The dynamic statements GRANT, REVOKE, ALTER, CREATE, and DROP

You also cannot use any SQL statement that you cannot prepare dynamically (such as SET CURRENT PACKAGESET, CONNECT, EXECUTE, PREPARE) as a dynamic SQL statement.

Remote DB2 Servers: For a package using DRDA access, DB2 sends the DYNAMICRULES option to the DB2 server at bind time. For a plan or package using DB2 private protocol access, DB2 sends the DYNAMICRULES option to the DB2 server at run time.

Defaults:

Process	Default value
BIND PLAN	RUN
BIND PACKAGE	plan value
REBIND PLAN	existing value
REBIND PACKAGE	existing value

The default for a package on a remote server is RUN.

Catalog Record: Column DYNAMICRULES of tables SYSPACKAGE and SYSPLAN.

ENABLE	DISABLE	On: BIND and REBIND
	(*) (BATCH) (CICS) (CICS) CICS(<i>applid</i> , ...) (DB2CALL) (DLIBATCH) (DLIBATCH) DLIBATCH(<i>connection-name</i> , ...) (IMS) (IMSBMP) (IMSBMP) IMSBMP(<i>imsid</i> , ...) (IMSMPP) (IMSMPP) IMSMPP(<i>imsid</i> , ...) (REMOTE) (BIND and REBIND PACKAGE only) (REMOTE) REMOTE (<i>location-name</i> ,..., < <i>luname</i> >,...) (RRSAF)	PLAN and PACKAGE

Determines which connections can use the plan or package. You cannot use both DISABLE and ENABLE. For packages, DISABLE and ENABLE are valid only for local bind operations.

ENABLE

Lists the system connection types that can use the plan or package. Connection types not listed cannot use it.

DISABLE

Lists the system connection types that cannot use the plan or package. Connection types not listed can use it.

With some connection types you can list connection IDs to identify specific connections of the type to disable or enable.

If you list connection IDs as disabled, any connections not listed for the same connection type are enabled.

If you list connection IDs as enabled, any connections not listed for the same connection type are disabled.

A connection ID is valid only after the keyword that names its corresponding connection type.

Connection Types:

(*) All valid connection types. Use only with ENABLE.

(BATCH)

All Time Sharing Option (TSO) connections are either enabled or disabled for the plan or package.

(CICS)

The Customer Information Control System (CICS) connection. All CICS VTAM node names specified in the CICS SIT table are either enabled or disabled for the plan or package.

(CICS) CICS(*applid*, ...)

applid is a CICS VTAM node name specified in the APPLID parameter of the CICS SIT table. The CICS VTAM node identified by *applid* is either enabled or disabled for the plan or package.

Bind Options: ENABLE/DISABLE

(DB2CALL)

The call attachment facility (CAF) connection is either enabled or disabled for the plan or package.

(DLIBATCH)

The Data Language 1 (DL/I) Batch Support Facility connection. All connection identifiers from the DDITV02 data set or the job name in the JCL that the DL/I batch support system needs to have are either enabled or disabled for the plan or package.

(DLIBATCH) DLIBATCH(*connection-name*, ...)

connection-name is a connection identifier as from the DDITV02 data set or the job name in the JCL that the DL/I batch support system needs to have. The DL/I batch connection identified by *connection-name* is either enabled or disabled for the plan or package.

(IMS)

All Information Management System (IMS) connections, DLIBATCH, IMSBMP, and IMSMPP are either enabled or disabled for the plan or package.

(IMSBMP)

The IMS connection for the Batch Message Program (BMP) region. All IMS BMP connections identified by the value of IMSID on the CTL parameter EXEC are either enabled or disabled for the plan or package.

(IMSBMP) IMSBMP(*imsid*, ...)

imsid is the value of IMSID on the CTL parameter EXEC. The IMS BMP connection identified by *imsid* is either enabled or disabled for the plan or package.

(IMSMPP)

The IMS connection for the Message Processing Program (MPP) and IMS Fast Path (IFP) regions. All IMS MPP connections identified by the value of the IMSID on the CTL parameter EXEC. are either enabled or disabled for the plan or package.

(IMSMPP) IMSMPP(*imsid*, ...)

imsid is the value of IMSID on the CTL parameter EXEC. The IMS MPP connection identified by *imsid* is either enabled or disabled for the plan or package.

(REMOTE)

All remote connections are either enabled or disabled for the plan or package.

(REMOTE) REMOTE (*location-name*,...,<*luname*>,...) (PACKAGE only)

The remote connections identified by the following are either enabled or disabled for the package:

location-name The location name of a requesting DBMS that **is** a DB2 for OS/390 subsystem.

<*luname*> The logical unit name, as defined to VTAM at the server location, of a requesting DBMS that **is not** a DB2 for OS/390 subsystem.

You must bracket a logical unit name with the less than (<) and the greater than (>) characters to differentiate it from a location name.

(RRSAF)

The RRS attachment facility connection is either enabled or disabled for the plan or package.

Performance Hint: Whenever the plan or package is allocated, DB2 must check the connection type and connection name with the list of enabled or disabled connections. For best performance, keep the list short.

Plans that Disable a System: If a plan disables a system, then no packages appended to that plan can run from that system, regardless of the ENABLE/DISABLE options. However, if the same packages are appended to other plans that enable the system, those packages can run from that system under those plans.

Defaults:

Process	Default value
BIND PLAN	ENABLE(*)
BIND PACKAGE	ENABLE(*)
REBIND PLAN	existing value
REBIND PACKAGE	existing value

Catalog Record: Table SYSPKSYSTEM for packages and table SYSPLSYSTEM for plans.

Product-sensitive Programming Interface

EXPLAIN
(NO)
(YES)
On: BIND and REBIND PLAN
and PACKAGE

Obtains information about how SQL statements in the package, or in the member list of the plan, will execute. Inserts that information into the table *owner.PLAN_TABLE*, where *owner* is the authorization ID of the owner of the plan or package. This option does not obtain information for statements that access remote objects.

PLAN_TABLE must be a table; it cannot be a view, alias, or synonym. It should exist before the bind process begins.

You can get EXPLAIN output for a statement embedded in a program bound with EXPLAIN(NO) by embedding the SQL statement EXPLAIN in the program. Otherwise, the value of the EXPLAIN option applies to all explainable SQL statements in the program, and to the fullselect portion of any DECLARE CURSOR statements.

In all inserts to *owner.PLAN_TABLE*, the value of QUERYNO is the statement number that the precompiler assigned and placed in the DBRM.

For automatic rebind: EXPLAIN(YES) is in effect if you bind the plan or package with EXPLAIN(YES) and the value of field EXPLAIN PROCESSING on installation panel DSNTIPO is YES. If EXPLAIN(YES) and VALIDATE(BIND) are in effect and PLAN_TABLE is not correct, the automatic rebind fails.

Bind Options: FLAG

(NO) Provides no EXPLAIN information.

(YES) Inserts information in *owner.PLAN_TABLE*. If the table does not exist at bind time, the value of the option *VALIDATE* determines the success of the bind operation.

If the value is *BIND*, then the bind fails.

If the value is *RUN*, DB2 checks to see if the table exists again at run time. If it still does not exist, the plan or package cannot run. If it does exist, DB2 inserts information in *PLAN_TABLE* before the plan or package runs.

Invalidation Resulting from an Unsuccessful Rebind: An unsuccessful rebind generating a return code of greater than 4 invalidates the rebind object. If the rebind fails because of either the *REBIND* option *EXPLAIN* or the SQL statement *EXPLAIN* (that is, *PLAN_TABLE* does not exist or was created incorrectly), DB2 rolls back all changes to the object, and leaves it as it was before the rebind attempt.

Defaults:

Process	Default value
BIND PLAN	NO
BIND PACKAGE	NO
REBIND PLAN	existing value
REBIND PACKAGE	existing value

Catalog Record: Column *EXPLAIN* of table *SYSPACKAGE* and column *EXPLAN* of *SYSPLAN*.

For a description of *PLAN_TABLE*, see the article about *EXPLAIN(SQL)* in Chapter 6 of *SQL Reference*.

_____ End of Product-sensitive Programming Interface _____

FLAG	(I) (W) (E) (C)	On: BIND and REBIND PLAN and PACKAGE
-------------	--------------------------	-------------------------------------------------

Determines what messages to display.

(I) All informational, warning, error, and completion messages.

(W) Only warning, error, and completion messages.

(E) Only error and completion messages.

(C) Only completion messages.

Rebinding Multiple Plans or Packages: When your *REBIND* command contains an asterisk (*) and affects many plans or packages, *FLAG(E)* is recommended to avoid running out of message storage.

Defaults:

Process	Default value
BIND PLAN	I

```

BIND PACKAGE      I
REBIND PLAN       I
REBIND PACKAGE    I

```

```

# IMMEDIATEWRITE      (NO)                      On: BIND and REBIND PLAN
#                     (YES)                    and PACKAGE

```

```

#
# Allows DB2 to immediately write to the group buffer pool (GBP) as data is being
# updated by a transaction. This option is applicable only for data sharing environ-
# ments, where one transaction (the originating transaction) schedules another trans-
# action (the dependent transaction).

```

```

# (NO)
# Writes to the GBP occur when data updated by the originating transaction has
# been committed or rolled back.

```

```

# (YES)
# Writes to the GBP dependent pagesets and partitions happen immediately as
# the GBP is updated by the originating transaction. This option can impact the
# performance of your database.

```

```

# Usage Notes:

```

- ```

#
• IMMEDIATEWRITE (YES) should be used when transactions are dependent on one
another's uncommitted updates and when these transactions run on different
DB2 members. By specifying IMMEDIATEWRITE (YES) on the originating trans-
action, updates can be immediately visible to the dependent transaction
whether the dependent transaction is in the same member or not.
IMMEDIATEWRITE (YES) can affect your database performance, if you have bind
plans or packages that make multiple updates.
#
• Alternatives to the IMMEDIATEWRITE (YES) option:
#
– Always run the dependent and originating transactions on the same DB2
member.
#
– Run the dependent transaction with ISOLATION (RR).
#
– Wait until phase II of the commit process is completed before scheduling
the dependent transaction.
#
– Use CURRENTDATA (YES) or ISOLATION (RR). This alternative works
only if the originating transaction updates columns that are not in the
WHERE clause of the dependent transaction.

```

```

Defaults:

```

| Process        | Default value  |
|----------------|----------------|
| BIND PLAN      | NO             |
| BIND PACKAGE   | NO             |
| REBIND PLAN    | existing value |
| REBIND PACKAGE | existing value |

```

The default for a package bound on a remote DB2 server is NO.

```

## Bind Options: ISOLATION

---

|           |                                      |                                         |
|-----------|--------------------------------------|-----------------------------------------|
| ISOLATION | (RR)<br>(RS)<br>(CS)<br>(UR)<br>(NC) | On: BIND and REBIND PLAN<br>and PACKAGE |
|-----------|--------------------------------------|-----------------------------------------|

---

Determines how far to isolate an application from the effects of other running applications.

**(RR)** *Repeatable Read*. Ensures that:

- Your application does not read a row that another process has changed until that process releases that row.
- Other processes do not change a row that your application reads until your application commits or terminates.

**(RS)** *Read Stability*. Ensures that:

- Your application does not read a row that another process has changed until that process releases that row.
- Other processes do not change a row that satisfies the application's search condition until your application commits or terminates. It does allow other application processes to insert a row, or to change a row that did not originally satisfy the search condition.

If the server does not support RS, it uses RR.

**(CS)** *Cursor Stability*. Like repeatable read, cursor stability ensures that your application does not read a row that another process changes until that process releases that row. Unlike repeatable read, cursor stability does not prevent other applications from changing rows that your application reads before your program commits or terminates.

**(UR)** *Uncommitted Read*. Unlike repeatable read and cursor stability, uncommitted read does not ensure anything. It avoids acquiring locks on data and allows:

- Other processes to change any row your application reads during the unit of work.
- Your application to read any row that another process has changed, even if the process has not committed the row.

You can use this option only with a read-only operation: SELECT, SELECT INTO, or FETCH using a read-only cursor. If you specify ISOLATION(UR) for any other operation, DB2 uses ISOLATION(CS) for that operation.

**(NC)** *No Commit*. Used on packages bound to certain servers other than DB2 for OS/390. DB2 for OS/390 does not support it. If the server does not support this isolation level, it uses UR.

### Defaults:

| Process        | Default value  |
|----------------|----------------|
| BIND PLAN      | RR             |
| BIND PACKAGE   | plan value     |
| REBIND PLAN    | existing value |
| REBIND PACKAGE | existing value |

The default for binding a package to a remote server is **RR**.

For REBIND PACKAGE, you cannot change ISOLATION from a specified value to a default of the plan value by using REBIND PACKAGE. To do that, you must use BIND PACKAGE ACTION(REPLACE).

**Catalog Record:** Column ISOLATION of tables SYSPACKAGE and SYSPLAN.

For more information about how the option ISOLATION affects locking and concurrency, including how DB2 resolves conflicts by using the most restrictive value when the values specified in the plan and package differ, see Section 4 of *Application Programming and SQL Guide*.

|              |               |                                         |
|--------------|---------------|-----------------------------------------|
| KEEPDPYNAMIC | (NO)<br>(YES) | On: BIND and REBIND PLAN<br>and PACKAGE |
|--------------|---------------|-----------------------------------------|

Determines whether DB2 keeps dynamic SQL statements after commit points.

**(NO)** Specifies that DB2 does not keep dynamic SQL statements after commit points.

**(YES)** Specifies that DB2 keeps dynamic SQL statements after commit points.

If you specify KEEPDPYNAMIC(YES), the application does not need to prepare an SQL statement after every commit point. DB2 keeps the dynamic SQL statement until one of the following occurs:

- The application process ends
- A rollback operation occurs.
- The application executes an explicit PREPARE statement with the same statement identifier.

If you specify KEEPDPYNAMIC(YES), and the prepared statement cache is active, DB2 keeps a copy of the prepared statement in the cache. If the prepared statement cache is not active, DB2 keeps only the SQL statement string past a commit point. DB2 then implicitly prepares the SQL statement if the application executes an OPEN, EXECUTE, or DESCRIBE operation for that statement.

If you specify KEEPDPYNAMIC(YES), you must not specify REOPT(VARS). KEEPDPYNAMIC(YES) and REOPT(VARS) are mutually exclusive.

**Performance Hint:** KEEPDPYNAMIC(YES) results in improved performance if your DRDA client application uses a cursor defined WITH HOLD. DB2 automatically closes a held cursor when there are no more rows to retrieve, which eliminates an extra network message.

**Defaults:**

| Process        | Default value  |
|----------------|----------------|
| BIND PLAN      | NO             |
| BIND PACKAGE   | NO             |
| REBIND PLAN    | Existing value |
| REBIND PACKAGE | Existing value |

The default for a package on a remote DB2 server is KEEPDPYNAMIC(NO).

**Catalog Record:** Column KEEPDPYNAMIC of table SYSPLAN and SYSPACKAGE.

## Bind Options: MEMBER

---

|                |                                                                        |                                    |
|----------------|------------------------------------------------------------------------|------------------------------------|
| <b>LIBRARY</b> | <i>(dbrm-pds-name)</i><br><i>(dbrm-pds-name, ...)</i> (BIND PLAN only) | <b>On: BIND PLAN, BIND PACKAGE</b> |
|----------------|------------------------------------------------------------------------|------------------------------------|

---

Determines what partitioned data sets (libraries) to search for the DBRMs listed in the MEMBER option. The libraries must be cataloged.

The bind process searches for the libraries in the order that you list them. If the libraries do not contain some DBRM listed in the MEMBER option, and if a JCL statement exists for DBRMLIB DD, then the process searches for the member among the libraries that the JCL statement describes.

*dbrm-pds-name* is the data set name of a library.

**For BIND PACKAGE**, you can specify only one library to search.

**For BIND PLAN**, you can specify one or more libraries to search.

### **Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | none                 |
| BIND PACKAGE   | none                 |
| REBIND PLAN    | n/a                  |
| REBIND PACKAGE | n/a                  |

The default is to search only the libraries described by the DD statement for DBRMLIB.

---

|               |                                                                              |                                    |
|---------------|------------------------------------------------------------------------------|------------------------------------|
| <b>MEMBER</b> | <i>(dbrm-member-name)</i><br><i>(dbrm-member-name, ...)</i> (BIND PLAN only) | <b>On: BIND PLAN, BIND PACKAGE</b> |
|---------------|------------------------------------------------------------------------------|------------------------------------|

---

Determines what database request modules (DBRMs) to include in the plan or package.

### *dbrm-member-name*

The name of a library member that contains a DBRM. You can name the partitioned data set, of which a DBRM is a member, either in the LIBRARY option or in the JCL statement for DBRMLIB DD.

For BIND PACKAGE only, the name becomes the package name. Names beginning with DSN are reserved; you receive a warning message if you use one.

**For BIND PACKAGE**, you can use only one member. If you do not use MEMBER, you must use COPY. You cannot use both options.

**For BIND PLAN**, you can list many members. DB2 sorts the member list in alphabetical order. If you do not use MEMBER, you must use PKLIST.

### **Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | none                 |
| BIND PACKAGE   | none                 |

|                |     |
|----------------|-----|
| REBIND PLAN    | n/a |
| REBIND PACKAGE | n/a |

**Catalog Record:** Column NAME of table SYSPACKAGE for BIND PACKAGE, or the table SYSDBRM for BIND PLAN.

---

|                        |                                                                    |                                 |
|------------------------|--------------------------------------------------------------------|---------------------------------|
| <b>PKLIST NOPKLIST</b> | ( <i>location-name.collection-id.package-id, ...</i> ) PKLIST only | <b>On: BIND and REBIND PLAN</b> |
|------------------------|--------------------------------------------------------------------|---------------------------------|

---

PKLIST determines what packages to include in the package list for the plan. The order in which you list packages with partial identifiers determines the search order at run time and can affect performance.

NOPKLIST is used with REBIND PLAN only. NOPKLIST determines that the plan rebinds without a package list. If a package list already exists, then NOPKLIST deletes it.

*location-name* or \*

Names the location of the DBMS where the package resides, or defers that choice until run time. Use either a particular location name or an asterisk (\*), or omit this part of the identifier. The default is the local DBMS.

If you use a particular location name, then that DBMS should be defined in catalog table SYSLOCATIONS. If that table does not exist or if the DBMS is not in it, you receive warning messages.

If you use an asterisk, at run time the location comes from the special register CURRENT SERVER. DB2 checks privileges to use the SQL statements in the package at that location.

*collection-id* or \*

Names the collection that contains the package or defers that choice until run time. Use either a particular collection ID or an asterisk (\*). There is no default.

If you use an asterisk, then DB2 checks the privileges to use the SQL statements embedded in the package run time. At that time also, DB2 determines the collection ID as follows:

- If the value in the special register CURRENT PACKAGESET is not blank, then that value is the collection ID.
- If the value of CURRENT PACKAGESET is blank, then DB2 skips the entry unless it is the last entry in the package list. If it is the last or only entry, an error message occurs.

*package-id* or \*

Names a particular package or specifies, by the asterisk, all packages in the collection. Because you cannot specify a *version-id* for the packages included in the package list, all versions are effectively included.

#### Defaults:

| Process        | Default value  |
|----------------|----------------|
| BIND PLAN      | none           |
| BIND PACKAGE   | n/a            |
| REBIND PLAN    | existing value |
| REBIND PACKAGE | n/a            |

## Bind Options: OPTIONS

PKLIST has no default; if you do not use PKLIST, you must use MEMBER.

The default for NOPKLIST is to use the package list specified in the PKLIST option, if any, during the current or previous bind or rebind.

**Catalog Record:** Table SYSPACKLIST.

For more information about:

- How the order of search for packages affects performance, see Section 5 of *Application Programming and SQL Guide*.
- How to define a location name in SYSLOCATIONS, see Section 3 of *Administration Guide*.
- The TSO/E restriction that limits the maximum number of packages specified in the PKLIST, see TSO/E Programming Services, SC28-1875.

---

### **NOREOPT(VARS) REOPT(VARS)**

**On: BIND and REBIND PLAN and PACKAGE**

---

Specifies whether to have DB2 determine an access path at run time using values for host variables, parameter markers, and special registers.

**NOREOPT(VARS)** Does not determine an access path at run time.  
**REOPT(VARS)** Re-determines the access path at run time.

#### **Usage Notes:**

- You cannot use both REOPT(VARS) and NOREOPT(VARS).
- You cannot use both REOPT(VARS) and KEEP DYNAMIC(YES).
- You cannot use both REOPT(VARS) and NODEFER(PREPARE).

#### **Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | NOREOPT              |
| BIND PACKAGE   | NOREOPT              |
| REBIND PLAN    | existing value       |
| REBIND PACKAGE | existing value       |

The default for a package on a remote DB2 server is NOREOPT(VARS).

**Catalog Record:** Column REOPT of table SYSPLAN and SYSPACKAGE.

---

### **OPTIONS(COMPOSITE) OPTIONS(COMMAND)**

**On: BIND PACKAGE COPY**

---

Specifies which bind options to use for the new package.

**COMPOSITE** The options for the new package are what you specify on the BIND PACKAGE COPY subcommand. Options that you do not specify are the option values taken from the SYSPACKAGE catalog table row that describes the source package to be copied.



**COMMAND**

The options for the new package are what you specify on the BIND PACKAGE COPY subcommand. Options that you do not specify are determined as follows:

- For a local copy, the DB2-defined BIND PACKAGE options defaults are used.
- For a remote copy, the server-defined BIND PACKAGE options defaults are used at the server. You must use the OPTIONS(COMMAND) when copying to a downlevel server. A down-level server is any server that is not DB2 Version 5.

**Defaults:**

|              | <b>Process</b>            | <b>Default value</b>                        |
|--------------|---------------------------|---------------------------------------------|
|              | BIND PACKAGE COPY         | OPTIONS(COMPOSITE)                          |
| <b>OWNER</b> | <i>(authorization-id)</i> | <b>On: BIND and REBIND PLAN and PACKAGE</b> |

Determines the authorization ID of the owner of the object (plan or package). The owner must have the privileges required to execute the SQL statements contained in the object.

If ownership changes, all grants for privileges on the object that the previous owner issued change to name the new owner as the grantor. The new owner has the privileges BIND and EXECUTE on the object and grants them to the previous owner.

You can bind or rebind only the objects for which the authorization ID has bind privileges. If you do not specify an authorization ID, the process rebinds only the objects for which the primary ID has bind privileges.

**For remote BIND or REBIND PACKAGE only**, the value of OWNER is subject to translation when sent to the remote system.

**Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | primary ID           |
| BIND PACKAGE   | primary ID           |
| REBIND PLAN    | existing value       |
| REBIND PACKAGE | existing value       |

The default owner is the primary authorization ID of the agent that runs the bind process.

**Catalog Record:** Column OWNER of table SYSPACKAGE, column GRANTOR of table SYSPACKAUTH, and column CREATOR of table SYSPLAN.

|                |                                                                                            |                                    |
|----------------|--------------------------------------------------------------------------------------------|------------------------------------|
| <b>PACKAGE</b> | <i>(location-name.collection-id.package-id.(version-id))</i><br>(* ) (REBIND PACKAGE only) | <b>On: BIND and REBIND PACKAGE</b> |
|----------------|--------------------------------------------------------------------------------------------|------------------------------------|

## Bind Options: PACKAGE

Determines what package or packages to bind or rebind.

The following options identify the location, collection, package name, and version of the package. You can identify a location and collection. For BIND, the DBRM supplies the package ID and version ID if you use the option MEMBER, or those IDs come from the option COPY. For REBIND, you must identify a package name, and you can also supply a version ID.

### *location-name*

The location of the DBMS where the package binds or rebinds and where the description of the package resides. The location name must be defined in catalog table SYSLOCATIONS. If that table does not exist or if the DBMS is not in it, you receive an error message.

The default is the local DBMS.

### *collection-id* or \*

The collection to contain the package to bind, or that already contains the package to rebind. There is no default.

For REBIND, you can use an asterisk (\*) to rebind all local packages with the specified *package-id* in all the collections for which you have bind privileges.

### *package-id* or \* **(For REBIND only)**

The name of the package to rebind, as listed in column NAME of catalog table SYSPACKAGE. There is no default.

You can use an asterisk (\*) to rebind all local packages in *collection-id* for which you have bind privileges.

### *version-id* or \* **(For REBIND only)**

The version of the package to rebind, as listed in column VERSION of catalog table SYSPACKAGE.

You can use an asterisk (\*) to rebind all local versions of the specified *package-id* in *collection-id* for which you have bind privileges.

Using simply () rebinds the version of the package that is identified by the empty string.

If you omit *version-id*, the default depends on the how you specify *package-id*. If you use \* for *package-id*, then *version-id* defaults to \*. If you explicitly provide a value for *package-id*, then *version-id* defaults to the empty string version.

DBRMs created in releases of DB2 before Version 2 Release 3 use a *version-id* of the empty string by default.

### **(\*) (For REBIND only)**

Rebinds all local DB2 packages for which the applicable authorization ID has the BIND privilege. Specifying (\*) is the same as specifying the package name as (\*.\*) or (\*.\*). The applicable authorization ID is:

- The value of OWNER, if you use that option
- The primary authorization ID of the process running the bind, if you do not use the option OWNER

**Catalog Record:** Columns COLLID, NAME, and VERSION of table SYSPACKAGE.

For more information about:

- How to define a location name in SYSLOCATIONS, see Section 3 of *Administration Guide* .
- Which packages are bound depending on how you specify collections, packages, and versions on the REBIND PACKAGE command, see Section 4 of *Application Programming and SQL Guide*.

---

|             |                                                |                                 |
|-------------|------------------------------------------------|---------------------------------|
| <b>PLAN</b> | ( <i>plan-name</i> )<br>(* (REBIND PLAN only)) | <b>On: BIND and REBIND PLAN</b> |
|-------------|------------------------------------------------|---------------------------------|

---

Determines what plan or plans to bind or rebind.

(*plan-name*)

The name of the application plan.

**For REBIND only**, the value of column NAME in the catalog table SYSPLAN; you can use a list of plan names.

The default is to perform all bind functions, including error diagnostics, without producing an application plan and without inserting rows into PLAN\_TABLE for the option EXPLAIN.

(\* **(For REBIND only)**)

Rebinds all plans for which the applicable authorization ID has the BIND privilege. The applicable ID is:

- The value of OWNER, if you use that option
- The authorization ID of the process running the bind, if you do not use the option OWNER

**Catalog Record:** Column NAME of table SYSPLAN.

---

|                  |                           |                                             |
|------------------|---------------------------|---------------------------------------------|
| <b>QUALIFIER</b> | ( <i>qualifier-name</i> ) | <b>On: BIND and REBIND PLAN and PACKAGE</b> |
|------------------|---------------------------|---------------------------------------------|

---

Determines the implicit qualifier for unqualified names of tables, views, indexes, and aliases contained in the plan or package.

(*qualifier-name*)

The value of the implicit qualifier. This value is not subject to translation when sent to a remote system for BIND or REBIND PACKAGE.

**Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | owner ID             |
| BIND PACKAGE   | owner ID             |
| REBIND PLAN    | existing value       |
| REBIND PACKAGE | existing value       |

The default is the owner's authorization ID, whether you use the OWNER option or its default.

**Catalog Record:** Column QUALIFIER of tables SYSPACKAGE and SYSPLAN.

## Bind Options: SQLERROR

---

|                |                                        |                                                 |
|----------------|----------------------------------------|-------------------------------------------------|
| <b>RELEASE</b> | <b>(COMMIT)</b><br><b>(DEALLOCATE)</b> | <b>On: BIND and REBIND PLAN<br/>and PACKAGE</b> |
|----------------|----------------------------------------|-------------------------------------------------|

---

Determines when to release resources that a program uses, either at each commit point or when the program terminates.

### **(COMMIT)**

Releases resources at each commit point.

### **(DEALLOCATE)**

Releases resources only when the program terminates. The value has no effect on dynamic SQL statements, which always use `RELEASE(COMMIT)`, with one exception: When you use `RELEASE(DEALLOCATE)` and `KEEPDYNAMIC(YES)`, and your subsystem is installed with `YES` for field `CACHE DYNAMIC SQL` on installation panel `DSNTIP4`, the `RELEASE(DEALLOCATE)` option is honored for dynamic `SELECT`, `INSERT`, `UPDATE` and `DELETE` statements. Locks acquired for dynamic statements are held until one of the following events occurs:

- The application process ends (deallocation).
- The application issues a `PREPARE` statement with the same statement identifier. (Locks are released at the next commit point.)
- The statement is removed from the cache because it has not been used. (Locks are released at the next commit point.)
- An object that the statement is dependent on is dropped or altered, or a privilege needed by the statement is revoked. (Locks are released at the next commit point.)

`RELEASE(DEALLOCATE)` can increase the package or plan size, because additional items become resident in the package or plan.

### **Defaults:**

| <b>Process</b>              | <b>Default value</b> |
|-----------------------------|----------------------|
| <code>BIND PLAN</code>      | <code>COMMIT</code>  |
| <code>BIND PACKAGE</code>   | plan value           |
| <code>REBIND PLAN</code>    | existing value       |
| <code>REBIND PACKAGE</code> | existing value       |

The default for a package bound at a remote server is **COMMIT**.

### **Catalog Record:**

Column `RELEASE` of tables `SYSPACKAGE` and `SYSPLAN`.

For more information about how the option affects locking and concurrency, see Section 5 (Volume 2) of *Administration Guide* or Section 5 of *Application Programming and SQL Guide*.

---

|                 |                                         |                              |
|-----------------|-----------------------------------------|------------------------------|
| <b>SQLERROR</b> | <b>(NOPACKAGE)</b><br><b>(CONTINUE)</b> | <b>On: BIND PACKAGE only</b> |
|-----------------|-----------------------------------------|------------------------------|

---

Determines whether to create a package if SQL errors occur.

**(NOPACKAGE)**

Creates no package if an error occurs.

**(CONTINUE)**

Creates a package, even if errors occur when binding SQL statements. The statements in error cannot execute. Any attempt to execute them at run time causes errors.

**Defaults:**

| Process        | Default value |
|----------------|---------------|
| BIND PLAN      | n/a           |
| BIND PACKAGE   | NOPACKAGE     |
| REBIND PLAN    | n/a           |
| REBIND PACKAGE | n/a           |

Because you cannot use the option SQLERROR for REBIND PACKAGE, the value for the previous package remains in effect when you rebind that package. If you rebind a package that uses SQLERROR(CONTINUE), those SQL statements found in error at bind time do not rebind.

**Catalog Record:** Column SQLERROR of table SYSPACKAGE.

SQLRULES

(DB2)  
(STD)

On: BIND and REBIND PLAN

Determines whether you can execute a type 2 CONNECT statement to an existing SQL connection, according to DB2 rules. Alternatively, the statement causes an error, according to the ANSI/ISO SQL standard of 1992. This option applies to any application process that uses the plan and executes type 2 CONNECT statements. It has no effect on type 1 CONNECT statements or the rules for DB2 private protocol access.

**(DB2)** No error occurs if CONNECT identifies an existing SQL connection. If X is an existing SQL connection, CONNECT TO X makes X the current connection. If X is already the current connection, CONNECT TO X has no effect on the state of any connections.

**(STD)** An error occurs if CONNECT identifies an existing SQL connection. Therefore, if X is a dormant SQL connection, you must use the SQL statement SET CONNECTION to make X the current connection.

For local operations, the value of SQLRULES is used for the initial value of the SQL special register CURRENT RULES.

**Defaults:**

| Process        | Default value  |
|----------------|----------------|
| BIND PLAN      | DB2            |
| BIND PACKAGE   | n/a            |
| REBIND PLAN    | existing value |
| REBIND PACKAGE | n/a            |

**Catalog Record:** Column SQLRULES of table SYSPLAN.

## Bind Options: VALIDATE

---

|          |                                   |                                             |
|----------|-----------------------------------|---------------------------------------------|
| VALIDATE | ( <u>RUN</u> )<br>( <u>BIND</u> ) | On: <b>BIND and REBIND PLAN and PACKAGE</b> |
|----------|-----------------------------------|---------------------------------------------|

---

Determines whether to recheck, at run time, errors of the type "OBJECT NOT FOUND" and "NOT AUTHORIZED" found during bind or rebind. The option has no effect if all objects and needed privileges exist.

**(RUN)** If not all objects or privileges exist at bind time, the process issues warning messages, but the bind succeeds. DB2 checks existence and authorization again at run time for SQL statements that failed those checks during bind. The checks use the authorization ID of the plan or package owner.

**(BIND)** If not all objects or needed privileges exist at bind time, the process issues error messages, and does not bind or rebind the plan or package, *except that*:

*For BIND PACKAGE only*, if you use the option SQLERROR(CONTINUE), the bind succeeds but the SQL statements in it that have errors cannot execute.

### **Defaults:**

| <b>Process</b> | <b>Default value</b> |
|----------------|----------------------|
| BIND PLAN      | RUN                  |
| BIND PACKAGE   | RUN                  |
| REBIND PLAN    | existing value       |
| REBIND PACKAGE | existing value       |

**Catalog Record:** Column VALIDATE of tables SYSPACKAGE and SYSPLAN.

---

## -CANCEL THREAD (DB2)

The DB2 command CANCEL THREAD cancels processing for specific local or distributed threads.

**Abbreviation:** -CAN THD

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or a CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

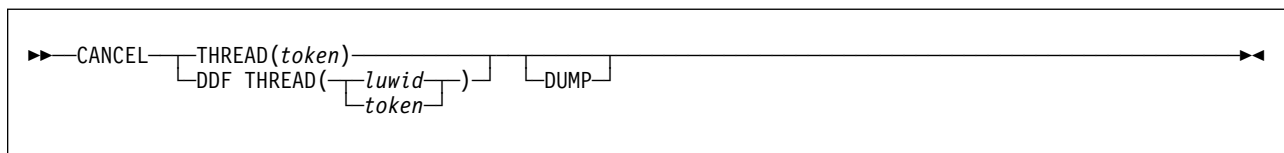
### Authorization

To execute this command, the privilege set of this process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

#### THREAD (token)

Identifies a specific thread, either distributed or not, whose processing you want to cancel. DB2 assigns a token to each thread that is unique for that DB2 subsystem, but not necessarily unique across subsystems.

The token is a 1 to 5 digit decimal number. It can be determined from the DB2 command DISPLAY THREAD or from an IFI READS call for IFCID 0147 or 0148. The token can also appear after the equal sign in DB2 messages that display an LUWID.

#### DDF THREAD(luwid)

Identifies distributed threads for which you want to cancel processing. *luwid* is a logical unit of work identifier (LUWID), consisting of:

- A fully qualified LU network name, which consists of:
  - A 1- to 8-character network ID
  - A period
  - A 1- to 8-character network LU name

## -CANCEL THREAD (DB2)

- An LUW instance number, which consists of 12 hexadecimal characters that uniquely identify the unit of work

If you enter three fields separated by periods, DB2 assumes that you are entering an LUWID.

You might have two or more distributed threads with the same LUWID. All distributed threads with the same LUWID are canceled.

The LUWID can be determined from the DB2 DISPLAY THREAD command and other DB2 messages.

### DUMP

Provides a dump for diagnostic purposes.

## Usage Notes

**Canceling Distributed Threads:** Canceling a distributed thread can cause the thread to enter the indoubt state. Message DSNL450I is issued if the CANCEL command causes the DDF thread to be converted from active to indoubt. DB2 releases the resources that the thread holds when the indoubt state is resolved by automatic indoubt resolution with the coordinator, or by resolution with the command RECOVER INDOUBT.

**Canceling Active Threads:** The CANCEL command schedules a thread to be terminated in DB2. To terminate, the thread must be processing within DB2. If the thread does not terminate, it could be:

- Processing outside of DB2, possibly in the application. If that is the case, the thread does not terminate until the application makes a request to DB2. Use the MVS Cancel command to terminate the application immediately.
- Hung up in VTAM. Use VTAM commands to cause VTAM to return processing to DB2, which will terminate the thread. See topic below for details.

**Using VTAM Commands to Cancel SNA Distributed Threads:** If the CANCEL command does not terminate a distributed thread, it is possible that it is hung up in VTAM. Use the VTAM VARY NET,TERM command to cancel the thread's VTAM sessions. To do this, you need to know the VTAM session IDs (SIDs) that correspond to the thread. Take the following steps:

1. Issue the DB2 command DISPLAY THREAD(\*) LUWID(nnnn) DETAIL. (The value of *nnnn* is the token or LUWID provided by CANCEL DDF THREAD.)

This gives you the VTAM session IDs that must be canceled. Sessions are identified by the column header SESSID as shown in the following DISPLAY THREAD output:

```
-DIS THD(*) LUWID(123) DETAIL
```



```

DSNV401I - DISPLAY THREAD REPORT FOLLOWS:
DSNV402I - ACTIVE THREADS:
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
BATCH TR * 5 BKH2C SYSADM BKH2 000D 123
V444-DB2NET.LUND0.9F6D9F459E92=123 ACCESSING DATA AT
V446-SAN JOSE:LUND1
V447--LOCATION SESSID A ST TIME
V448--SAN JOSE 00D3590EA1E89701 S1 9332108460302
V448--SAN JOSE 00D3590EA1E89822 V R1 9332108460431
DISPLAY ACTIVE REPORT COMPLETE
DSNV9022I - DSNVDT '-DIS THD' NORMAL COMPLETION

```

The **V** indicates the thread is processing in VTAM.

- Record positions 3 through 16 of SESSID for the threads to be canceled. (In the DISPLAY THREAD output above, the values are D3590EA1E89701 and D3590EA1E89822.)
- Issue the VTAM command DISPLAY NET to display the VTAM session IDs. The ones you want to cancel match the SESSIDs in positions 3 through 16 and the corresponding session IDs are in bold. The following is an output example of this command:

```

D NET,ID=LUND0,SCOPE=ACT

IST097I DISPLAY ACCEPTED
IST075I NAME = LUND0, TYPE = APPL
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST171I ACTIVE SESSIONS = 0000000005, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME STATUS SID SEND RECV VR TP NETID
IST635I LUND1 ACTIV-S D24B171032B76E65 0051 0043 0 0 NET2
IST635I LUND1 ACTIV-S D24B171032B32545 0051 0043 0 0 NET2
IST635I LUND1 ACTIV-R D2D3590EA1E89701 0022 0031 0 0 NET2
IST635I LUND1 ACTIV-R D2D3590EA1E89802 0022 0031 0 0 NET2
IST635I LUND1 ACTIV-R D2D3590EA1E89822 0022 0031 0 0 NET2
IST314I END

```

- Issue the VTAM command VARY NET,TERM for each of the VTAM SIDs associated with the DB2 thread. In this case, it might be necessary to cancel only the session ID that DISPLAY THREAD shows to be processing in VTAM (D2D3590EA1E89822).

For more information about VTAM commands, see *VTAM for MVS/ESA Operation*

## Examples

**Example 1:** To cancel a non-distributed thread whose token you found through -DISPLAY THREAD and to produce a diagnostic dump, issue:

```
-CANCEL THREAD (123) DUMP
```

**Example 2:** To cancel a distributed thread whose LUWID you found through -DISPLAY THREAD, issue:

```
-CANCEL DDF THREAD (LUDALLAS.DB2SQL1.3042512B6425)
```

Assume that the output from -DISPLAY THREAD shows that the thread-ID and token associated with this LUWID is 45162. You can also cancel this thread by issuing:

## **-CANCEL THREAD (DB2)**

`-CANCEL DDF THREAD (45162)`

or

`-CANCEL THREAD (45162)`

As in the first example, specifying DUMP with any of the commands shown in this example would cause a diagnostic dump to be produced.

## /CHANGE (IMS)

The IMS command /CHANGE resets an indoubt unit of recovery as identified by the OASN keyword of the /DISPLAY command. That command deletes the item from the standpoint of IMS, but it does not communicate to DB2.

**Abbreviation:** /CHA

## Environment

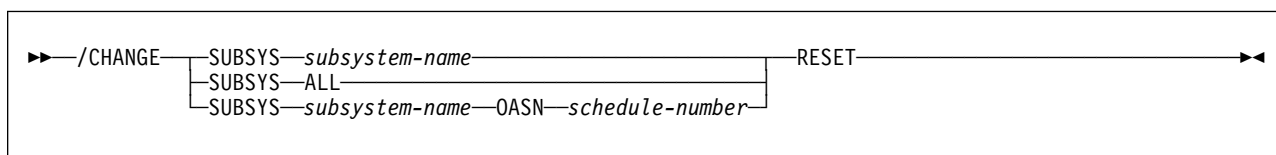
This command can be issued only from an IMS terminal.

**Data Sharing Scope:** Member

## Authorization

This command requires an appropriate level of IMS authority, as described in *IMS/ESA Administration Guide: System*.

## Syntax



## Option Descriptions

### SUBSYS

Deletes IMS recovery elements from one or more subsystems.

One of the following subparameters must be coded:

*subsystem-name*, ...

Specifies one or more subsystems from which recovery elements will be deleted.

### ALL

Deletes IMS recovery elements from all subsystems.

*subsystem-name* **OASN** *schedule-number*, ...

Deletes one or more origin application schedule numbers from one subsystem, specified by *subsystem-name*.

*schedule-number* can be a list of up to 32768 origin application schedule numbers. The numbers are displayed using the OASN parameter of the /DISPLAY command.

### RESET

Deletes the indoubt recovery unit. The recovery unit represents an incomplete unit of work assigned to an external subsystem as the result of an application request.

## /CHANGE (IMS)

### Usage Note

The preceding description of the /CHANGE command is a partial description only. For a complete description, see *IMS/ESA Operator's Reference*.

### Examples

**Example 1:** Reset all indoubt recovery units for subsystem DB2.

```
/CHA SUBSYS DB2 RESET
```

**Example 2:** Reset all indoubt recovery units for all subsystems.

```
/CHA SUBSYS ALL RESET
```

**Example 3:** Reset indoubt recovery units identified by OASN numbers 99, 685, and 2920 for subsystem DB2.

```
/CHA SUBSYS DB2 OASN 99 685 2920 RESET
```

## DCLGEN (DECLARATIONS GENERATOR) (DSN)

The declarations generator (DCLGEN) produces an SQL DECLARE TABLE statement and a COBOL, PL/I, or C data declaration for a table or view named in the catalog.

For further information regarding the DCLGEN command and uses for its output, see Section 3 of *Application Programming and SQL Guide*.

### Environment

The declarations generator is executed by the DSN subcommand DCLGEN. That subcommand can be issued from a DSN session, running in either foreground or background mode, or it can be issued through DB2I.

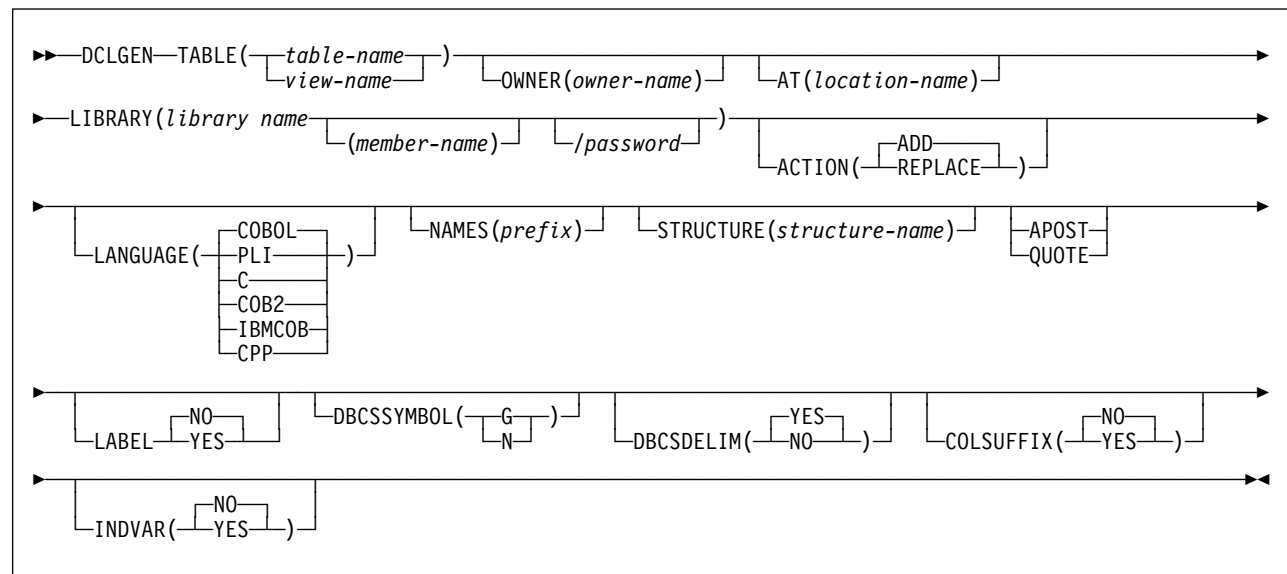
**Data Sharing Scope:** Group

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- SELECT privilege on the table or view
- Ownership of the table or view
- DBADM authority on the database containing the table
- SYSADM authority
- SYSCTRL authority (catalog tables only)

### Syntax



## Option Descriptions

### TABLE

Tells what table or view for which to generate a declaration. *table-name* or *view-name* is the qualified or unqualified name of the table or view.

The name must follow the following rules:

- If the name is a single-byte or mixed string and contains special characters other than underscores (`_`), it must be enclosed between apostrophes (`'`). If the language is COBOL, single-byte underscores in the name are translated into hyphens (`-`) by DCLGEN. Double-byte character set (DBCS) names need not be enclosed in apostrophes.
- If the name contains single-byte apostrophes, each one must be doubled (`' '`). (Some host languages do not permit apostrophes in variable names.)

A table or view name that contains a period and is not enclosed by apostrophes is a qualified table name. The characters to the left of the period constitute the table owner, and those to the right of the period constitute the table name. Any table name enclosed in apostrophes is an unqualified table name. To understand how DCLGEN determines the table name qualifier, see the description of the OWNER option, which follows.

### OWNER(*owner-name*)

Specifies a qualifier for the table name. *owner-name* is the qualifier for the table name.

If you specify a qualified table name for the TABLE(*table-name*) option, and you also specify OWNER(*owner-name*), the qualifier portion of *table-name* supersedes *owner-name* as the table name qualifier. If you specify an unqualified table name for the TABLE(*table-name*) option, and you do not specify OWNER(*owner-name*), the SQL authorization ID is the table name qualifier.

DCLGEN supports the use of underscore (`_`) as a valid character in the *owner-name* keyword parameter.

The following table illustrates the decision process for determining the DCLGEN table name qualifier.

|                                           | <b>OWNER(<i>owner-name</i>)<br/>specified</b> | <b>OWNER(<i>owner-name</i>)<br/>not specified</b> |
|-------------------------------------------|-----------------------------------------------|---------------------------------------------------|
| TABLE( <i>table-name</i> )<br>qualified   | <i>table-name</i> qualifier                   | <i>table-name</i> qualifier                       |
| TABLE( <i>table-name</i> )<br>unqualified | <i>owner-name</i>                             | SQL authorization ID                              |

### AT(*location-name*)

Identifies the location of the table or view name specified in TABLE (*table-name*). *location-name*, which can consist of 1 to 16 characters, uniquely identifies an instance of a table or view in a network.

If you specify AT, *location-name* is used as the prefix for the table name, and *table-name* or *table-view* must be a qualified name.

DCLGEN supports the use of underscore (`_`) as a valid character in the *location-name* keyword parameter.

**LIBRARY**(*library-name*(*member-name*)/*password*)

Specifies the data set into which the declarations go. This data set must already exist and be accessible to the declarations generator. It can be either sequential or partitioned.

If the library name is not enclosed within apostrophes, DCLGEN constructs the following full data set name:

*user-prefix.library-name.language.(member-name)*

where:

*user-prefix*        The user prefix of the primary authorization ID of the transaction.

*language*         The value of the LANGUAGE option: COBOL, COB2, PLI, or C;

(*member-name*)    Optional; if not used, the output goes to a sequential data set.

*password* is optional.

**ACTION**

Indicates whether to add or replace the data set.

**(ADD)**

Adds the data set as a new member, if it does not already exist.

The **default** is **ACTION(ADD)**.

**(REPLACE)**

Replaces an existing member or data set with the new one. If the output is to a partitioned data set, and no member exists with the given name, one is added.

**LANGUAGE**

Specifies the language of the generated declaration.

Possible languages are:

- **(COBOL)**, for OS/VS COBOL

The **default** can be set during DB2 installation. The IBM supplied default is **LANGUAGE(COBOL)**.

- **(COB2)**, for other COBOL languages
- **(PLI)**, for PL/I
- **(C)**, for C/370
- **(IBMCOB)**, for IBM COBOL
- **(CPP)**, for C++

**NAMES**(*prefix*)

Allows field names to be formed in the declaration.

Avoid possible name conflicts between DCLGEN output and the source program. If a conflict occurs, use NAMES or STRUCTURE, or manually edit the generated declaration or source program.

*prefix* can contain double-byte characters.

The field names consist of *prefix* concatenated with a number from one to three digits in length. *prefix* can have up to 28 characters. If *prefix* is a single-byte or

mixed string and the first character is not alphabetic, it must be enclosed in apostrophes. For example, if *prefix* is ABCDE, the field names will be ABCDE1, ABCDE2, and so on, up to a maximum of ABCDE999. Special characters can be used, but use caution to avoid possible name conflicts.

For COBOL and PL/I, if the prefix is a DBCS string, the field name will be the DBCS prefix concatenated with the DBCS representation of the number. For example, if *prefix* is <D1D2D3> (where "<" and ">" represent shift-out and shift-in characters, respectively, and D1D2D3 represent double-byte characters), generated field names will be <D1D2D3.1>, <D1D2D3.2>, and so on. The period (.) represents X'42'.

The column names in the table are taken as default names for the fields in the output.

### **STRUCTURE**(*structure-name*)

Specifies the generated data structure.

*structure-name* can have up to 31 characters. If *structure-name* is a single-byte or mixed string and the first character is not alphabetic, it must be enclosed in apostrophes. Special characters can be used, but use caution to avoid possible name conflicts.

*structure-name* can contain double-byte characters.

For SQL output, the name is the same as the table or view name. If the host language is C, the default structure name is the prefix DCL concatenated with the table name. If the host language is COBOL or PL/I and the table name is a single-byte or mixed string, the default structure name is also the prefix DCL concatenated with the table name. If the host language is COBOL or PL/I and the table name is a DBCS string, the default structure name is the prefix <D.C.L> concatenated with the table or view name. "<" and ">" represent shift-out and shift-in characters, respectively. You must guard against possible conflicts with names in the source program. DCLGEN allows the specified structure name to be the same as the table or view name, but will issue a warning message.

### **APOST or QUOTE**

Specifies the string delimiter character used in the host language. This option is effective only for COBOL programs.

APOST specifies the apostrophe (') as the host language string delimiter; the SQL delimiter is the quotation mark (").

QUOTE specifies the quotation mark (") as the host language delimiter; the SQL delimiter is the apostrophe (').

If neither APOST nor QUOTE is specified, the **default** is either APOST or QUOTE for COBOL, depending on what was specified on DB2 installation panel DSNTIPF.

The string delimiter delimits strings in host language statements. The SQL escape character delimits table and column names in the SQL DECLARE TABLE statement produced by DCLGEN. It is possible, by a choice made during DB2 installation, to make both delimiters the quotation mark or both the apostrophe.

### **LABEL**

Tells whether to include column labels in the output as comments. (Column labels can be assigned by the LABEL ON statement.)



**NO**

Omits the column labels.

The **default** is **LABELNO**.

**YES**

Includes the column labels.

**DBCSSYMBOL**

Specifies the symbol used to denote a graphic data type in a COBOL PICTURE clause.

**(G)**

Graphic data is denoted using G.

**(N)**

Graphic data is denoted using N.

**DBCSDELIM**

Specifies whether the DBCS table and column names in the generated DECLARE table statement will be delimited.

**(YES)**

DBCS table and column names will be delimited in the DCLGEN table declaration.

The **default** is **DBCSDELIM(YES)**.

**(NO)**

DBCS table and column names will not be delimited in the DCLGEN table declaration.

**COLSUFFIX**

Determines whether to form field names by attaching the column name to the prefix given by the NAMES option.

**(NO)**

The column name is not used as a suffix, and field names are controlled by the option NAMES, as in Version 3.

**(YES)**

If NAMES is specified, DCLGEN forms field names by adding column names as a suffix to the value of NAMES. For example, if the prefix given by NAMES is "NEW" and the column name is EMPNO, then the field name is "NEWEMPNO."

If NAMES is *not* specified, DCLGEN issues a warning message and uses the column names as the field names, as in Version 3.

**INDVAR**

Determines whether to create an indicator variable array for the host variable structure.

**(NO)**

DCLGEN does not create an indicator variable array.

**(YES)**

DCLGEN creates an indicator array for the host variable structure. The array name is the table name with a prefix of "I" (or DBCS letter "<I>" if the table name is double-byte).

## Usage Notes

Parsing of the DCLGEN command conforms to standard TSO parsing conventions. For information about TSO command parsing, see the *TSO/E Programming Services*.

**The DECLARE statement:** The DECLARE statement generated by DCLGEN will define all columns created with a data type of VARCHAR or LONG VARCHAR as VARCHAR. Columns created with a data type of VARGRAPHIC or LONG VARGRAPHIC will be defined as VARGRAPHIC.

**Comments:** The output for all host languages includes comments. The leading comment block echoes the DCLGEN subcommand that requested the declarations. The trailing comment block indicates the number of variables declared.

**Using the Output:** To include the DCLGEN output in an application program, use the SQL INCLUDE statement. The same member name specified in the DCLGEN LIBRARY parameter is specified on the INCLUDE statement.

**Prompts:** Online TSO will prompt for missing or incorrectly specified options.

**Editing the Output:** It is expected that the output of DCLGEN will not meet every need. You can freely edit the output before including it in a program. For example, you might want to change a variable name, or include SQL escape characters.

You can edit the output to add WITH DEFAULT to NOT NULL for columns that do not allow null values. If you edit the output, you must provide a default value.

If your column names contain embedded blanks, they will also be reflected in the host variable declarations, and you will have to remove, or translate, any blank characters to some other value.

**C:** DCLGEN support of the C language is unique in the following ways:

- DCLGEN does not fold the STRUCTURE, NAMES, or TABLE values to upper-case.
- For any DB2 column that has the data type CHAR( $n$ ), where  $n > 1$ , DCLGEN generates the corresponding host variable as CHAR( $n + 1$ ) to avoid the DB2 warning. For  $n = 1$ , the corresponding host variable is CHAR.

**COBOL and Binary Integers:** DB2 uses the full size of binary integers. It can place larger values than allowed in the specified number of digits in the COBOL declaration, which can result in truncated values.

For small integers that can exceed 9999, use S9(5). For large integers that can exceed 999,999,999, use S9(10) COMP-3 to obtain the decimal data type. If COBOL is used for integers that exceed the COBOL PICTURE, specify the column as decimal to ensure that the data types match and perform well.

**COBOL and the Underscore Character:** Because COBOL does not allow the use of the underscore character, DCLGEN translates any underscore characters in the table's column names into hyphens (-) for use in the generated structure.

**COBOL and DBCS:** OS/VS COBOL does not support DBCS, but later versions of COBOL (VS COBOL II and COBOL/370) do. Although DB2 accepts values outside

of the range from X'41' to X'FE', in COBOL data definition statements, both bytes of each double-byte character in data names must be within this range. Data names must also contain at least one DBCS character that does not have X'42' as its first byte.

**Data Declarations for Arrays of Indicator Variables:** If DCLGEN creates an array of indicator variables, data declarations have the following form:

| Language | Data Declaration                                                  |
|----------|-------------------------------------------------------------------|
| C        | short int <i>Itable-name</i> [ <i>n</i> ];                        |
| COBOL    | 01 <i>Itable-name</i> PIC S9(4) USAGE COMP OCCURS <i>n</i> TIMES. |
| PL/I     | DCL <i>Itable-name</i> ( <i>n</i> ) BIN FIXED (15);               |

where *n* is the number of columns in the table.

## Examples

**Example 1:** This example shows the use of the DCLGEN. The statement

```
DCLGEN TABLE(VEEMPL) -
 LIBRARY('prefix.SRCLIB.DATA(DSN8MPEM)') -
 LANGUAGE(PLI) -
 APOST
```

produces the following statements in *prefix.SRCLIB.DATA(DSN8MPEM)*:

```

/*****
/* DCLGEN TABLE(VEEMPL) - */
/* LIBRARY('prefix.SRCLIB.DATA(DSN8MPEM)') - */
/* LANGUAGE(PLI) - */
/* APOST */
/* ... IS THE DCLGEN COMMAND THAT MADE THE FOLLOWING STATEMENTS */
/*****
EXEC SQL DECLARE VEEMPL TABLE
 (EMPNO CHAR(6) NOT NULL,
 FIRSTNME VARCHAR(12) NOT NULL,
 MIDINIT CHAR(1) NOT NULL,
 LASTNAME VARCHAR(15) NOT NULL,
 WORKDEPT CHAR(3) NOT NULL
) ;

/*****
/* PLI DECLARATION FOR TABLE VEEMPL */
/*****
DCL 1 DCLVEEMPL,
 5 EMPNO CHAR(6),
 5 FIRSTNME CHAR(12) VAR,
 5 MIDINIT CHAR(1),
 5 LASTNAME CHAR(15) VAR,
 5 WORKDEPT CHAR(3);

/*****
/* THE NUMBER OF COLUMNS DESCRIBED BY THIS DECLARATION IS 5 */
/*****/

```

**Example 2:** This example shows the use of NAMES and STRUCTURE. The statement

```
DCLGEN TABLE(VEEMPL) -
 LIBRARY('prefix.SRCLIB.DATA(DSN8MPEM)') -
 LANGUAGE(PLI) -
 NAMES(FIELD) -
 STRUCTURE(EMPRECORD) -
 APOST
```

produces the following statements in *prefix.SRCLIB.DATA(DSN8MPEM)*:

```

/*****
/* DCLGEN TABLE(VEEMPL) - */
/* LIBRARY('prefix.SRCLIB.DATA(DSN8MPEM)') - */
/* LANGUAGE(PLI) - */
/* NAMES(FIELD) - */
/* STRUCTURE(EMPRECORD) - */
/* APOST */
/* ... IS THE DCLGEN COMMAND THAT MADE THE FOLLOWING STATEMENTS */
/*****
EXEC SQL DECLARE VEEMPL TABLE
 (EMPNO CHAR(6) NOT NULL,
 FIRSTNME VARCHAR(12) NOT NULL,
 MIDINIT CHAR(1) NOT NULL,
 LASTNAME VARCHAR(15) NOT NULL,
 WORKDEPT CHAR(3) NOT NULL
) ;

/*****
/* PLI DECLARATION FOR TABLE VEEMPL */
/*****
DCL 1 EMPRECORD,
 5 FIELD1 CHAR(6),
 5 FIELD2 CHAR(12) VAR,
 5 FIELD3 CHAR(1),
 5 FIELD4 CHAR(15) VAR,
 5 FIELD5 CHAR(3);

/*****
/* THE NUMBER OF COLUMNS DESCRIBED BY THIS DECLARATION IS 5 */
/*****

```

## /DISPLAY (IMS)

The IMS command /DISPLAY displays the status of the connection between IMS and an external subsystem (as well as all application programs communicating with the external subsystem), or the outstanding recovery units associated with the subsystem.

### Environment

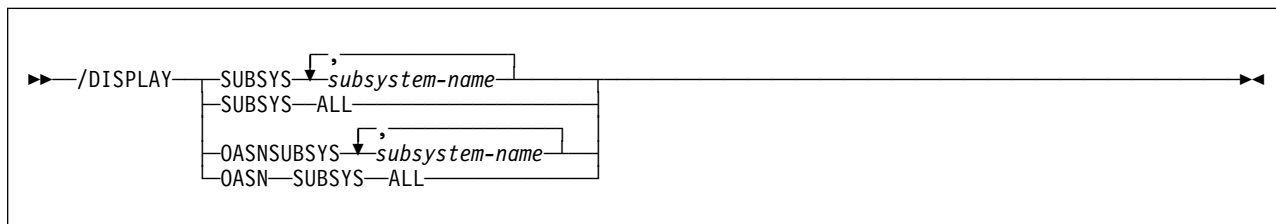
This command can be issued only from an IMS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of IMS authority, as described in the *IMS/ESA Administration Guide: System*.

### Syntax



### Option Descriptions

One of the following options is required:

#### SUBSYS

Tells which subsystems to display information about.

*subsystem-name, ...*

Specifies one or more subsystems. See “Output” on page 96 for a description of possible subsystem status.

#### ALL

Displays information about all subsystems.

#### OASN SUBSYS

Displays the outstanding recovery units (origin application schedule numbers, or OASN) associated with the external subsystems. The OASN is assigned by IMS when it schedules an application into a dependent region. That, coupled with the IMS ID, becomes the recovery token for units of work distributed to other subsystems.

*subsystem-name, ...*

Specifies one or more subsystems to display information about.

#### ALL

Displays the outstanding recovery units associated with all external subsystems.

## Output

The command recognition character (CRC) is displayed for each external subsystem. Subsystem status is one of the following:

**CONNECTED** An IMS control region or dependent region has successfully connected to the external subsystem. At this point, the two systems can begin a normal dialog.

**NOT CONNECTED**  
The external subsystem is in an idle state. That is, either it has not been the object of the /START SUBSYS command, or the external subsystem initialization exit routine indicated not to connect.

**CONNECT IN PROGRESS**  
The connection process for the specified subsystem is in progress.

**STOPPED** The specified subsystem has been stopped with the /STOP SUBSYS command. All region connections to the specified external subsystem have been terminated.

**STOP IN PROGRESS**  
The /STOP SUBSYS command is in progress. Before it completes successfully, all active connections to the specified subsystem from all IMS regions must be quiesced.

**INVALID SUBSYSTEM NAME = *subsystem-name***  
The indicated subsystem name has not been defined to the IMS subsystem PROCLIB member. Add the subsystem definition to the subsystem member and issue the /START SUBSYS command.

**SUBSYSTEM *subsystem-name* NOT DEFINED BUT RECOVERY OUTSTANDING**  
The indicated subsystem name has not been defined to IMS in the external subsystem PROCLIB member, but IMS still has outstanding recovery elements from a previous execution when the name was known. To resolve the recovery element problem, either add the indicated subsystem definition to the external subsystem PROCLIB member and then issue the /START SUBSYS command, or issue the /DISPLAY OASN SUBSYS command to determine the identification of the OASNs and then manually resolve the recovery elements by issuing the /CHANGE SUBSYS RESET command.

**TERM IN PROGRESS**  
An internal termination of the subsystem is underway. This type of termination was instigated by IMS abnormal condition processing, an external subsystem exit, or the external subsystem.

A thread between an IMS dependent region and an external subsystem is created when an application program in the region establishes a connection to the external subsystem. The status of threads to an external subsystem is listed under the status of the subsystem. The absence of a list of threads under a connected subsystem indicates that no threads to the specified subsystem have been established.

Thread status can be:

**CONNECTED(CONN)**  
An IMS control region or dependent region has successfully connected to the external subsystem.

ACTIVE            An IMS application program has established communication with an external subsystem.

The absence of a PSB name for a thread indicates that a connection to the external subsystem exists, but an application program is not currently occupying the region. The presence or absence of an LTERM name indicates whether a region is message-driven.

The preceding description of the /DISPLAY command is a partial description only. For a complete description, see *IMS/ESA Operator's Reference*.

## Example

**Example:** Display the status of connections between IMS and all subsystems.

```
/DISPLAY SUBSYSTEM ALL
```

| SUBSYS | CRC | REGID | PROGRAM  | LTERM   | STATUS      |
|--------|-----|-------|----------|---------|-------------|
| SSTR   | ?   |       |          |         | CONN        |
|        |     | 1     | DDLTLM17 | PTERM01 | CONN,ACTIVE |
|        |     | 2     | DDLTLM06 | PTERM02 | CONN        |

```
85202/065933
```

## -DISPLAY ARCHIVE (DB2)

---

## -DISPLAY ARCHIVE (DB2)

The DB2 command DISPLAY ARCHIVE displays input archive log information.

**Abbreviation:** -DIS ARC

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- ARCHIVE or DISPLAY system privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax

```
▶▶—DISPLAY ARCHIVE—◀◀
```

### Usage Note

**Data Sharing Members:** Although the command ARCHIVE LOG SCOPE(GROUP) or ARCHIVE LOG MODE(QUIESCE) initiates archive processing for all members of a data sharing group, the command DISPLAY ARCHIVE shows information only for the member for which it is issued. To display input archive log information for all members of a data sharing group, enter the command to each member.

### Example

**Example:** Display tape unit information about input archive logs.

```
-DISPLAY ARCHIVE
DSNJ322I - DISPLAY ARCHIVE REPORT FOLLOWS-
 COUNT TIME
 (TAPE UNITS) (MIN,SEC)
DSNZPARM 2 0,00
CURRENT 2 5,30
=====
ADDR STATUS CORR-ID VOLSER DATASET_NAME
290 AVAIL ***** TAPE1 DSNCAT.ARCHLOG1.A0000033
294 PREM ***** TAPE3 DSNCAT.ARCHLOG1.A0000035
293 BUSY RECOVER2 TAPE2 DSNCAT.ARCHLOG1.A0000034
END OF DISPLAY ARCHIVE REPORT.
DSN9022I - DSNJC001 '-DISPLAY ARCHIVE' NORMAL COMPLETION
```



This example report shows:

- The subsystem parameter values for MAX RTU (COUNT) and DEALLC PERIOD TIME as recorded in the DSNZPxxx load module
- Current specifications for the COUNT and TIME parameters
- Availability status of allocated dedicated tape units
- Volume and data set names associated with all busy tape units

## -DISPLAY BUFFERPOOL (DB2)

---

## -DISPLAY BUFFERPOOL (DB2)

The DB2 command DISPLAY BUFFERPOOL displays the current status for one or more active or inactive buffer pools.

**Abbreviation:** -DIS BPOOL

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

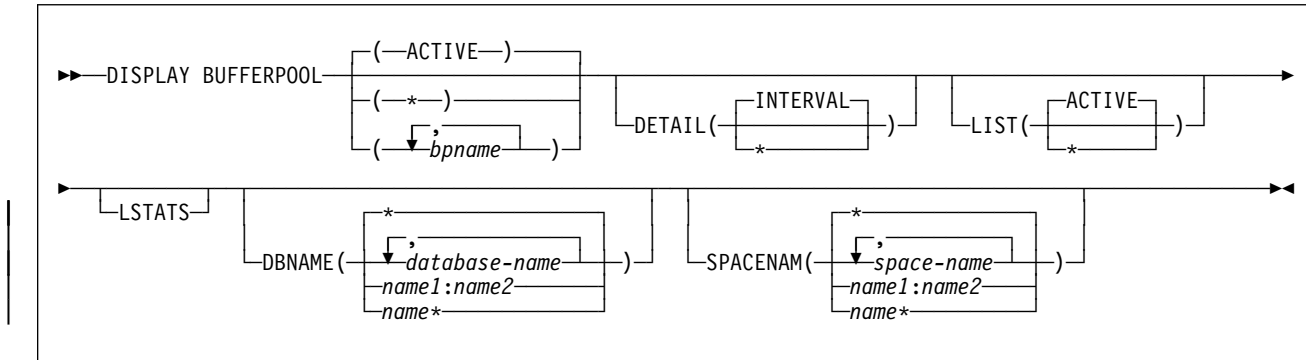
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- DISPLAY system privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

**(ACTIVE)**

Displays the current buffer pool status for all active buffer pools.

The **default** is **ACTIVE**.

**(\*)** Displays the current buffer pool status for all active or inactive buffer pools.

**(bpname)**

Names the buffer pool for which current status is to be displayed.

- 4KB page buffer pools are named BP0, BP1, ..., BP49
- 32KB page buffer pools are named BP32K, BP32K1, ..., BP32K9

**DETAIL**

Produces a detail report for one or more buffer pools. If DETAIL is not specified, a summary report is produced.

**(INTERVAL)**

Requests statistics accumulated since the last incremental display, or since the buffer pool was first activated if there was no previous incremental display.

The **default** is **INTERVAL**.

(\*) Requests statistics accumulated since the buffer pool was first activated.

**DBNAME**

Specifies which databases are included in the LIST display and the LSTATS display. If you specify DBNAME without LIST, LIST(ACTIVE) is assumed.

**ABBREVIATION:** DBN

*(database-name, ...)*

Identifies one or more databases to be included in the LIST and LSTATS displays. *database-name* can have any of the forms in the following list. In the list, *name1* and *name2* represent strings of from 1 to 8 characters. *name* represents a string of from 1 to 7 characters.

| <b>Form</b>        | <b>Displays the status of...</b>                                                               |
|--------------------|------------------------------------------------------------------------------------------------|
| <i>name1</i>       | The database <i>name1</i>                                                                      |
| <i>name1:name2</i> | All databases with names from <i>name1</i> to <i>name2</i> in a sorted list of database names. |
| <i>name*</i>       | All databases whose names begin with the string <i>name</i>                                    |

(\*) Displays information on all databases that match the LIST specification. This is the default.

**SPACENAM**

Specifies which table spaces or index spaces within the specified databases to include in the LIST display and the LSTATS display. If you use SPACENAM without DBNAME, DBNAME(\*) is assumed.

**ABBREVIATION:** SPACE

(\*) Displays information about all table spaces and index spaces of the specified databases. This is the default.

*(space-name, ...)*

Identifies one or more spaces to be included in the LIST and LSTATS displays. You can write *space-name* like *database-name* to designate:

- The name of a single table space or index space
- A range of names
- A partial name followed by a pattern character

## -DISPLAY BUFFERPOOL (DB2)

### LIST

Lists the open index spaces and table spaces associated with the buffer pools included in the report. It also indicates whether the given index space or table space is “group buffer pool” (GBP-dependent). An index space or table space is GBP-dependent if either of these conditions are true:

- There is inter-DB2 R/W interest in it.
- There are changed pages from it in the group buffer pool that have not yet been written to DASD.

### (ACTIVE)

Restricts the list of open index spaces and table spaces to those that are currently in use.

The **default** is **ACTIVE**.

- (\*) Requests a list of all open index spaces and table spaces, whether currently in use or not.

### LSTATS

Includes index space and table space statistics in the LIST report. If you specify LSTATS without LIST, LIST(ACTIVE) is assumed. The statistics displayed are incremental since the last time displayed.

## Output

You can request a summary report or a detail report.

### Summary report

A summary report contains the following information, as seen in Example 1 on page 105:

#### *Identification*

|                         |                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------|
| BUFFERPOOL NAME         | Bufferpool external name (BP0, BP1, ..., BP49, or BP32K, BP32K1, ..., BP32K9)                                       |
| BUFFERPOOL ID           | Bufferpool internal identifier (0-49, 80-89)                                                                        |
| USE COUNT               | Number of open table spaces or index spaces that reference this buffer pool (Inactive pools have a zero use count.) |
| VIRTUAL BUFFERPOOL SIZE | User specified virtual buffer pool size                                                                             |
| BUFFERS ALLOCATED       | Number of allocated buffers in an active virtual buffer pool                                                        |
| TO BE DELETED           | Number of buffers to be deleted in an active virtual buffer pool (because of pool contraction)                      |
| IN-USE/UPDATED          | Number of currently active (not stealable) buffers in the virtual buffer pool                                       |

#### *Hiperpool Values*

|                |                               |
|----------------|-------------------------------|
| HIPERPOOL SIZE | User specified hiperpool size |
| CASTOUT        | Hiperpool CASTOUT attribute   |

|               |                                                                                      |
|---------------|--------------------------------------------------------------------------------------|
| ALLOCATED     | Number of allocated buffers in an active hiperpool                                   |
| TO BE DELETED | Number of buffers to be deleted in an active hiperpool (because of pool contraction) |
| BACKED BY ES  | Number of hiperpool buffers backed by expanded storage                               |

**Thresholds**

|                         |                                                                     |
|-------------------------|---------------------------------------------------------------------|
| VP SEQUENTIAL           | Sequential steal threshold for the virtual buffer pool              |
| HP SEQUENTIAL           | Sequential steal threshold for the hiperpool                        |
| DEFERRED WRITE          | Deferred write threshold for the virtual buffer pool                |
| VERTICAL DEFERRED WRT   | Vertical deferred write threshold for the virtual buffer pool       |
| PARALLEL SEQUENTIAL     | Parallel sequential threshold for the virtual buffer pool           |
| ASSISTING PARALLEL SEQT | Assisting parallel sequential threshold for the virtual buffer pool |

**Names of Hiperspaces Allocated to the Hiperpool:** A hiperspace name consists of 3 parts, with a total length of 8 characters. A hiperspace name always starts with an indicator of "@" followed by:

1. The bufferpool's internal ID (two characters)
2. A sequence number about hiperspace allocation (one character)
3. The DB2 subsystem name (four characters)

**Detail report**

A detail report includes all summary report information and additional buffer pool related statistics. You can request cumulative statistics (accumulated since DB2 startup) or incremental statistics (accumulated since the last incremental display). A sample report appears in Example 2 on page 105. The statistics in a detail report are grouped in the following categories:

**Getpage information (message DSNB411I):**

|                  |                                                            |
|------------------|------------------------------------------------------------|
| RANDOM GETPAGE   | Non-sequential getpage requests                            |
| SYNC READ I/O(R) | Synchronous read I/O operations for non-sequential getpage |
| SEQ. GETPAGE     | Sequential getpage requests                                |
| SYNC READ I/O(S) | Synchronous read I/O operations for sequential getpage     |
| DMTH HIT         | Number of times data management threshold reached          |

**Sequential prefetch statistics (message DSNB412I):**

|              |                                               |
|--------------|-----------------------------------------------|
| REQUESTS     | Sequential prefetch requests                  |
| PREFETCH I/O | Sequential prefetch read I/O operations       |
| PAGES READ   | Number of pages read with sequential prefetch |

**List prefetch statistics (message DSNB413I):**

## -DISPLAY BUFFERPOOL (DB2)

|              |                                           |
|--------------|-------------------------------------------|
| REQUESTS     | List prefetch requests                    |
| PREFETCH I/O | List prefetch read I/O operations         |
| PAGES READ   | Number of pages read due to list prefetch |

### ***Dynamic prefetch statistics (message DSNB414I):***

|              |                                            |
|--------------|--------------------------------------------|
| REQUESTS     | Dynamic prefetch requests                  |
| PREFETCH I/O | Dynamic prefetch read I/O operations       |
| PAGES READ   | Number of pages read with dynamic prefetch |

### ***Disabled prefetch statistics (message DSNB415I):***

|                |                                       |
|----------------|---------------------------------------|
| NO BUFFER      | Prefetch disabled - no buffer         |
| NO READ ENGINE | Prefetch disabled - no read processor |

### ***Page update statistics (message DSNB420I):***

|                   |                                   |
|-------------------|-----------------------------------|
| SYS PAGE UPDATES  | System page updates               |
| SYS PAGES WRITTEN | System pages written              |
| ASYNC WRITE I/O   | Asynchronous write I/O operations |
| SYNC WRITE I/O    | Synchronous write I/O operations  |

### ***Page write statistics (message DSNB421I):***

|                  |                                                                  |
|------------------|------------------------------------------------------------------|
| DWT HIT          | Number of times deferred write threshold reached                 |
| VERTICAL DWT HIT | Number of times vertical deferred write threshold reached        |
| NO WRITE ENGINE  | Number of times write processor not available for I/O operations |

### ***Hiperpool activity (not using the Asynchronous Data Mover Facility):*** (message DSNB430I)

|                 |                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYNC HP READS   | Number of times that a requested page was found in hiperpool and synchronously moved to virtual buffer pool                                                          |
| SYNC HP WRITES  | Number of pages synchronously moved from the virtual buffer pool to the hiperpool                                                                                    |
| ASYCN HP READS  | Number of times that a requested page was found in hiperpool and asynchronously moved to virtual buffer pool without the use of the Asynchronous Data Mover Facility |
| ASYNC HP WRITES | Number of pages asynchronously moved from the virtual buffer pool to the hiperpool without the use of the Asynchronous Data Mover Facility                           |
| READ FAILURES   | Number of page read failures (other than those that occurred using the Asynchronous Data Mover Facility)                                                             |
| WRITE FAILURES  | Number of page write failures (other than those that occurred using the Asynchronous Data Mover Facility)                                                            |

**Hiperpool activity (using the Asynchronous Data Mover Facility) (message DSNB431I):**

HP READS            Number of pages moved asynchronously from the hiperpool to the virtual pool using the Asynchronous Data Mover Facility

HP WRITES           Number of pages moved asynchronously from the virtual pool to the hiperpool using the Asynchronous Data Mover Facility

READ FAILURES      Number of page read failures that occurred using the Asynchronous Data Mover Facility

WRITE FAILURES     Number of page write failures using that occurred the Asynchronous Data Mover Facility

**Parallel processing activity (message DSNB440I):**

PARALLEL REQUEST            Number of negotiations for task streams for parallel processing activity

DEGRADED PARALLEL           Number of times negotiation resulted in a degraded mode of operation

## Examples

**Example 1:** A summary report is the default report if the DETAIL option is not specified. The following is an example of a summary report which could be produced by the command:

```
-DISPLAY BUFFERPOOL(BP0)

DSNB401I - BUFFERPOOL NAME BP0, BUFFERPOOL ID 0, USE COUNT 10
DSNB402I - VIRTUAL BUFFERPOOL SIZE = 1000 BUFFERS
 ALLOCATED = 1000 TO BE DELETED = 0
 IN-USE/UPDATED = 200
DSNB403I - HIPERPOOL SIZE = 100000 BUFFERS, CASTOUT = YES
 ALLOCATED = 100000 TO BE DELETED = 0
 BACKED BY ES = 89152
DSNB404I - THRESHOLDS -
 VP SEQUENTIAL = 80 HP SEQUENTIAL = 80
 DEFERRED WRITE = 50 VERTICAL DEFERRED WRT = 10
PARALLEL SEQUENTIAL = 50 ASSISTING PARALLEL SEQT= 80
DSNB405I - HIPERSPACE NAMES - @001SSOP
DSN9022I - DSNB1CMD '-DISPLAY BUFFERPOOL' NORMAL COMPLETION
```

**Example 2:** A detail report can be generated that includes all summary report information and additional buffer pool related statistics. The following is an example of a detail report that could be produced by the command:

```
-DISPLAY BUFFERPOOL(BP0) DETAIL
```

## -DISPLAY BUFFERPOOL (DB2)

```
DSNB401I - BUFFERPOOL NAME BP0, BUFFERPOOL ID 0, USE COUNT 10
DSNB402I - VIRTUAL BUFFERPOOL SIZE = 1000 BUFFERS
 ALLOCATED = 1000 TO BE DELETED = 0
 IN-USE/UPDATED = 200
DSNB403I - HIPERPOOL SIZE = 600000 BUFFERS, CASTOUT = YES
 ALLOCATED = 600000 TO BE DELETED = 0
 BACKED BY ES = 483651
DSNB404I - THRESHOLDS -
 VP SEQUENTIAL = 80 HP SEQUENTIAL = 80
 DEFERRED WRITE = 50 VERTICAL DEFERRED WRT = 10
 PARALLEL SEQUENTIAL = 50
DSNB405I - HIPERSPACE NAMES - @001SSOP @002SSOP

DSNB409I - INCREMENTAL STATISTICS SINCE 10:32:48 OCT 23, 1993

DSNB411I - RANDOM GETPAGE = 230 SYNC READ I/O (R) = 180
 SEQ. GETPAGE = 610 SYNC READ I/O (S) = 20
 DMTH HIT = 0
DSNB412I - SEQUENTIAL PREFETCH -
 REQUESTS = 0 PREFETCH I/O = 0
 PAGES READ = 0
DSNB413I - LIST PREFETCH -
 REQUESTS = 0 PREFETCH I/O = 0
 PAGES READ = 0
DSNB414I - DYNAMIC PREFETCH -
 REQUESTS = 0 PREFETCH I/O = 0
 PAGES READ = 0
DSNB415I - PREFETCH DISABLED -
 NO BUFFER = 0 NO READ ENGINE = 0
DSNB420I - SYS PAGE UPDATES = 0 SYS PAGES WRITTEN = 0
 ASYNC WRITE I/O = 0 SYNC WRITE I/O = 0
DSNB421I - DWT HIT = 0 VERTICAL DWT HIT = 0
 NO WRITE ENGINE = 0
DSNB430I - HIPERPOOL ACTIVITY (NOT USING ASYNCHRONOUS
 DATA MOVER FACILITY) -
 SYNC HP READS = 100 SYNC HP WRITES = 0
 ASYNC HP READS = 0 ASYNC HP WRITES = 0
 READ FAILURES = 0 WRITE FAILURES = 0
DSNB431I - HIPERPOOL ACTIVITY (USING ASYNCHRONOUS
 DATA MOVER FACILITY) -
 HP READS = 244 HP WRITES = 3
 READ FAILURES = 0 WRITE FAILURES = 0
DSNB440I - PARALLEL ACTIVITY -
 PARALL REQUEST = 0 DEGRADED PARALL = 0

DSN9022I - DSNB1CMD '-DISPLAY BUFFERPOOL' NORMAL COMPLETION
```

**Example 3:** With the summary or detail report, you can list open table spaces and index spaces associated with the buffer pool. You can also request a display of statistics for each listed table space and index space. An example of a report generating this information could be produced by the command:

```
-DISPLAY BUFFERPOOL(BP0) LIST LSTATS
```



## -DISPLAY BUFFERPOOL (DB2)

```
DSNB401I - BUFFERPOOL NAME BP0, BUFFERPOOL ID 0, USE COUNT 3
DSNB402I - VIRTUAL BUFFERPOOL SIZE = 1000 BUFFERS
 ALLOCATED = 1000 TO BE DELETED = 0
 IN-USE/UPDATED = 200
DSNB403I - HIPERPOOL SIZE = 100000 BUFFERS, CASTOUT = YES
 ALLOCATED = 100000 TO BE DELETED = 0
 BACKED BY ES = 89152
DSNB404I - THRESHOLDS -
 VP SEQUENTIAL = 80 HP SEQUENTIAL = 80
 DEFERRED WRITE = 50 VERTICAL DEFERRED WRT = 10
 PARALLEL SEQUENTIAL = 50
DSNB405I - HIPERSPACE NAMES - @001SSOP
DSNB450I - TABLESPACE = DSND01.DBD01, USE COUNT = 2, GBP-DEP=N
DSNB450I - TABLESPACE = DSND06.SYSDBASE, USE COUNT = 1, GBP-DEP=N
DSNB451I - INDEXSPACE = DSND06.DSNDLX01, USE COUNT = 4, GBP-DEP=N
DSNB452I - STATISTICS FOR DATASET 1 -
DSNB455I - SYNCHRONOUS I/O DELAYS -
 AVERAGE DELAY = 22 MAXIMUM DELAY = 35
 TOTAL PAGES = 23
DSN9022I - DSNB1CMD '-DISPLAY BUFFERPOOL' NORMAL COMPLETION
```

## -DISPLAY DATABASE (DB2)

---

### -DISPLAY DATABASE (DB2)

The DB2 command DISPLAY DATABASE displays information about the status of DB2 databases, table spaces, tables in segmented table spaces, index spaces within a database, and partitions of partitioned table spaces and index spaces. -DISPLAY DATABASE also indicates if a table space, index space, or partition is in any “pending” status.

In a data sharing environment, the command can be issued from any DB2 in the group that has access to the database.

**Abbreviation:** -DIS DB

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group

### Authorization

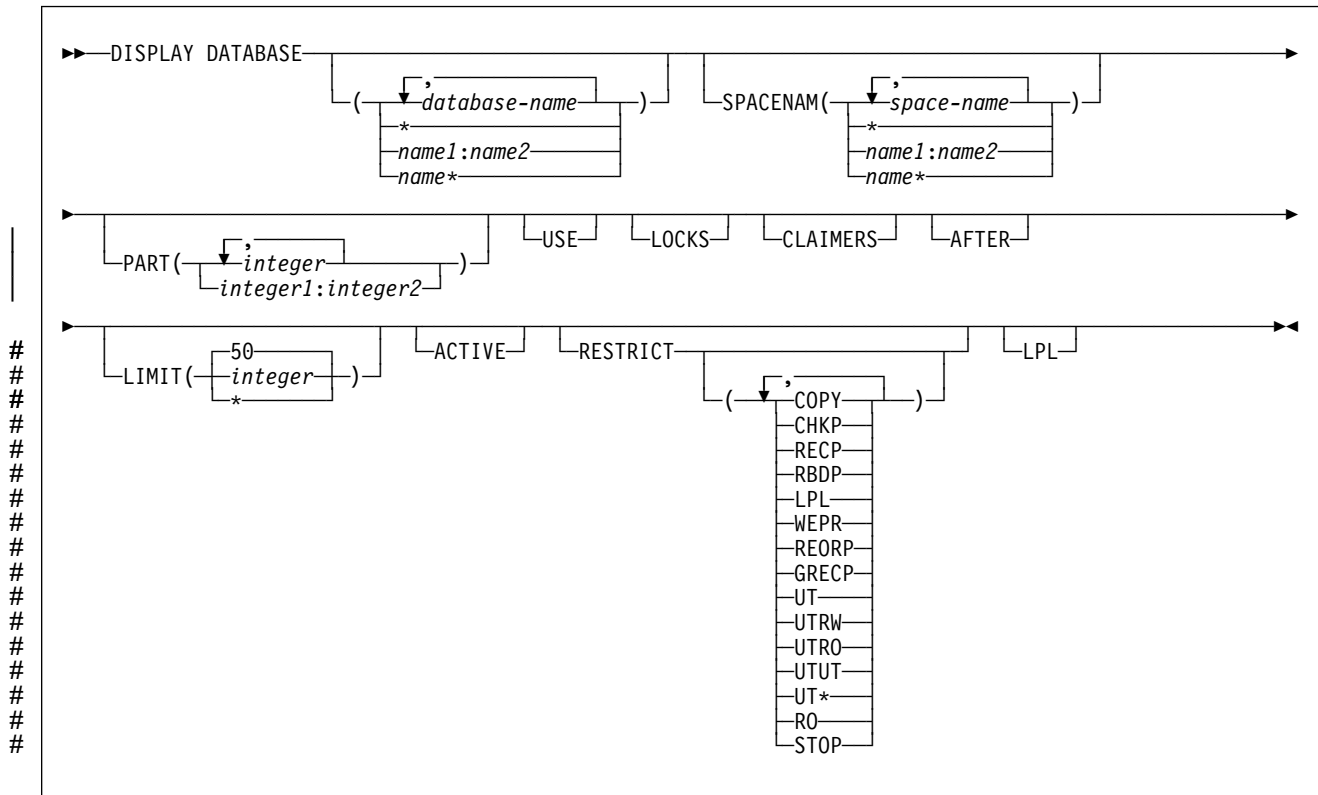
No special privilege is required to issue -DISPLAY DATABASE.

The DISPLAY system privilege allows you to display status information for any database. The resulting display lists those databases for which the primary authorization ID or any of the secondary authorization IDs has the DISPLAYDB privilege. Error messages are produced for those databases specified over which the set of privileges does not include one of the following:

- DISPLAYDB privilege
- DISPLAY privilege
- DBMAINT, DBCTRL, or DBADM authority
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



## Option Descriptions

(*database-name, ...*)

Identifies one or more databases whose status is to be displayed. *database-name* can have any of the forms in the following list (where *name1* and *name2* represent any strings of from 1 to 8 characters, and *name* represents any string of from 1 to 7 characters):

| Form               | Displays the status of...                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------|
| <i>name1</i>       | The database <i>name1</i>                                                                                      |
| <i>name1:name2</i> | All databases whose names collate greater than or equal to <i>name1</i> and less than or equal to <i>name2</i> |
| <i>name*</i>       | All databases whose names begin with the string <i>name</i>                                                    |

(\*) Displays information on all databases defined to the DB2 subsystem for which the privilege set of the process has the required authorization.

### SPACENAM

Specifies what space to display. If you use SPACENAM, you must also specify the corresponding database name. You cannot use SPACENAM if more than one database name is specified. However, if (\*) is used to specify multiple databases, SPACENAM(\*) can be specified to display all objects in these databases.

**Abbreviation:** SPACE

(\*) Displays information about all table spaces and index spaces of the specified database.

## -DISPLAY DATABASE (DB2)

*(space-name, ...)*

Lists one or more spaces whose status is to be displayed. You can write *space-name* like *database-name* to designate:

- The name of a single table space or index space
- A range of names
- A partial name

**PART** (*integer, ...*)

Indicates the partition number of one or more partitions whose status is to be displayed. The *integer* specified must identify a valid partition number for the corresponding space name and database name. *integer* can be written to designate either:

- a list of one or more partitions, or
- a range of all partition numbers that collate greater than or equal to *integer1* and less than or equal to *integer2*

Both a list and a range cannot be specified.

### USE

Displays information about the following:

- The applications and subsystems of the database or space that has internal DB2 resources allocated
- The applications and subsystems of the database or space on whose behalf locks for the space are held or waited upon
- The connection IDs, correlation IDs, and authorization IDs for all applications allocated to spaces and partitions whose statuses are displayed
- The LUWID and location of any remote threads accessing the local database

### LOCKS

Displays information about the following:

- The applications and subsystems on whose behalf locks are held, waited upon, or retained for the database or space
- The transaction locks for all table spaces, tables, index spaces and partitions whose statuses are displayed
- The connection IDs, correlation IDs, and authorization IDs for all applications allocated to spaces whose statuses are displayed
- The LUWID and location of any remote threads accessing the local database
- The drain locks for a resource held by running jobs
- The logical partitions that have drain locks and the drain locks associated with them
- The retained locks for a resource
- The page set or partition physical locks (P-locks) for a resource

LOCKS overrides USE. If both LOCKS and USE are specified, USE is ignored.

For a description of DB2 locking, see Section 5 (Volume 2) of *Administration Guide* .

### CLAIMERS

Displays information about the following:

- The claims on all table spaces, index spaces and partitions whose statuses are displayed
- The LUWID and location of any remote threads accessing the local database
- The connection IDs, correlation IDs, and authorization IDs for all applications allocated to spaces whose statuses are displayed
- The logical partitions that have logical claims and the claims associated with them

CLAIMERS overrides both LOCKS and USE. If you specify CLAIMERS, any references to LOCKS or USE are ignored.

### AFTER

Displays the following information:

- If only a database name is used, AFTER continues the display of all other databases whose names collate greater than that name.
- If SPACENAM and a table space or index space name are used, AFTER continues the display to all other table spaces or index spaces in the same database whose names collate greater than that name.

AFTER cannot be used with more than one database name, or with more than one table space or index space name.

### LIMIT

Limits the number of messages to be displayed by the command.

*(integer)*

Is the maximum number of messages that are to be displayed. The **default** is **50**. The maximum number of messages that can be displayed is limited by the space available.

(\*) Limits the display to the space available.

### ACTIVE

Limits the display to table spaces or index spaces that have had internal DB2 resources allocated to applications and are in a started state or to databases that contain such spaces.

**Abbreviation:** A

**Default:** Using neither ACTIVE nor RESTRICT displays information on all databases defined to DB2.

### RESTRICT

Limits the display to databases, table spaces, or indexes in a restricted status. This includes those page sets that have logical page list entries.

**Abbreviation:** RES

Use of a database is restricted if the database is in any one of the following situations:

- It is started for read-only processing
- It is started for utility-only processing

## -DISPLAY DATABASE (DB2)

- It is stopped

Use of a table space or index space is restricted if:

- It is in one of the three situations above
- It is being processed by a utility
- It is in copy pending, check pending, recover pending, or group buffer pool recover pending status
- It contains a page error range
- It contains pages in the logical page list (LPL)

# One or more of the following options can be specified to restrict displayed  
# objects:

# **(COPY)**  
# Displays objects that are in copy pending status.

# **(CHKP)**  
# Displays objects that are in check pending status.

# **(RECP)**  
# Displays objects that are in recovery pending status. This includes  
# restricted states RECP, PSRCP, RECP\*, LPL, and WEPR (Write Error  
# Page Range).

# **(RBDP)**  
# Displays index objects that are in rebuild or recovery pending status. This  
# includes restricted states RBDP, PSRCP, LPL, and WEPR.

# **(LPL)**  
# Displays logical page list entries.

# **(WEPR)**  
# Displays write error page range information.

# **(REORP)**  
# Displays objects that are in reorg pending status.

# **(GRECP)**  
# Displays objects that are in group buffer pool recover pending status.

# **(RO)**  
# Displays objects that are in read only mode.

# **(UT)**  
# Displays objects that are in utility access mode.

# **(UTRW)**  
# Displays objects that are serialized for utility access and available for  
# read/write access.

# **(UTRO)**  
# Displays objects that are serialized for utility access and available for read  
# access.

# **(UTUT)**  
# Displays objects that are serialized for utility access and unavailable for  
# other access.

```

(UT*)
Displays objects that are in UT, UTRW, UTRO, or UTUT states.
#
(STOP)
Displays objects that are stopped. This includes restricted states STOP,
STOPE, STOPP, and LSTOP.

LPL
 Displays logical page list entries.

```

## Usage Notes

**Displaying DB2 Catalog Tables:** The DB2 catalog tables can always be displayed. However, if a table space in the catalog containing information about user databases or user table spaces is stopped, those databases or table spaces cannot be displayed. Trying to display them will cause an error. See Appendix D of *SQL Reference* for a list of table space names and assigned tables.

If DISPLAY DATABASE LOCKS is issued on the catalog (DSNDB06), the user may see a lock held on SYSDBASE with the correlation ID 020.DBCMD\_05 or 020.DBCMD\_06. This simply indicates the lock that DISPLAY DATABASE itself needs and is normal.

**Displaying Restricted Objects:** To display all resources that are in restricted status, you must issue the DISPLAY DATABASE command twice. To display table spaces and indexes in restricted status, use the SPACENAM parameter with RESTRICT. To display databases in restricted status, do NOT use the SPACENAM parameter. Spaces could be unavailable even if they show RW mode if the database is in restricted status.

**Communications Database (CDB) and Resource Limit Facility (RLF):** If the command specifies a table space or index space in the communications database or in the active resource limit facility database, then the USE option displays the names of all members of the data sharing group that are using the specified table space or index space. Knowing which other members of the data sharing group might be using these spaces is useful when considering whether to drop table spaces and index spaces in the communications database and the resource limit facility database.

**Displaying Logical Partitions:** If you issue DISPLAY DATABASE with the PART parameter for a logical partition of a type 2 index, DB2 does not display physical claimers and physical locks in the output.

## Output

**Message DSNT392I Status Information:** The status codes displayed by the DISPLAY DATABASE command and their respective descriptions are as follows:

|       |                                                                                                                                         |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------|
| CHKP  | The object (a table space or a partition within a table space) is in the check pending state.                                           |
| COPY  | The object (a table space or a partition within a table space) is in the copy pending state. An image copy is required for this object. |
| GRECP | The object is GBP-dependent and a group buffer pool recovery is pending.                                                                |

## -DISPLAY DATABASE (DB2)

|       |                                                                                                                                                                                                                                                                                     |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LPL   | The object has entries in the logical page list.                                                                                                                                                                                                                                    |
| LSTOP | The logical partition of a nonpartitioned index is stopped.                                                                                                                                                                                                                         |
| PSRCP | The index space is in a page set recover pending state.                                                                                                                                                                                                                             |
| RECP  | The object (a table space, table space partition, index space, index partition or logical index partition) is in the recover pending state.                                                                                                                                         |
| RECP* | The logical index partition is in the recover pending state, and the entire index is inaccessible to SQL applications. However, only the logical partition needs to be recovered.                                                                                                   |
| REST  | The table space or index space is being restarted.                                                                                                                                                                                                                                  |
| RO    | The database, table space, table space partition, index space or index space partition is started for read-only activity.                                                                                                                                                           |
| RW    | The database, table space, table space partition, index space or index space partition is started for read and write activity.                                                                                                                                                      |
| STOP  | The database, table space, table space partition, index space or index space partition is stopped.                                                                                                                                                                                  |
| STOPE | The table space or index space was implicitly stopped because there is a problem with the log RBA in a page. Message DSNT500I or DSNT501I is issued when the error is detected, indicating the inconsistency.                                                                       |
| STOPP | A stop is pending for the database, table space, table space partition, index space or index space partition.                                                                                                                                                                       |
| UT    | The database, table space, table space partition, index space or index space partition is started for utility processing only.                                                                                                                                                      |
| UTRO  | A utility is in process, on the table space, table space partition, index space or index space partition, that allows only RO access. If the utility was canceled before the object was drained, the object can allow SQL access because the object was not altered by the utility. |
| UTRW  | A utility is in process, on the table space, table space partition, index space or index space partition, that allows RW access.                                                                                                                                                    |
| UTUT  | A utility is in process, on the table space, table space partition, index space or index space partition, that allows only UT access. If the utility was canceled before the object was drained, the object can allow SQL access because the object was not altered by the utility. |

## Examples

**Example 1:** Display information about table space TBS33 in database CB3. USE causes *connection-name*(CONNID), *correlation-id*(CORRID), and *authorization ID* (USERID) information to be displayed.

```
-DISPLAY DATABASE(CB3) SPACENAM(TBS33) USE
```



The following output is generated:

```

DSNT360I - *****
DSNT361I - * DISPLAY DATABASE SUMMARY
 * GLOBAL USE
DSNT360I - *****
DSNT362I - DATABASE = CB3 STATUS = RW
 DBD LENGTH = 4028
DSNT397I -
NAME TYPE PART STATUS CONNID CORRID USERID

TBS33 TS 01 RW LSS001 DSN2SQL SYSADM
TBS33 TS 02 RW LSS001 DSN2SQL SYSADM
TBS33 TS 03 RW LSS001 DSN2SQL SYSADM
TBS33 TS 04 RW LSS001 DSN2SQL SYSADM
***** DISPLAY OF DATABASE CB3 ENDED *****
DSN9022I . DSNTDDIS 'DISPLAY DATABASE' NORMAL COMPLETION

```

**Example 2:** Display information about table space TBS33 in database CB3 when the table space is defined with LOCKPART YES. LOCKS displays lock information for table spaces and tables specified; LUWIDs and locations of any remote threads; and *connection-name*, *correlation-id*, and *authorization ID* information.

```
-DISPLAY DATABASE(CB3) SPACENAM(TBS33) LOCKS
```

The following output is generated:

```

DSNT360I - *****
DSNT361I - * DISPLAY DATABASE SUMMARY
 * GLOBAL LOCKS
DSNT360I - *****
DSNT362I - DATABASE = CB3 STATUS = RW
 DBD LENGTH = 4028
DSNT397I -
NAME TYPE PART STATUS CONNID CORRID LOCKINFO

TBS33 TS 01 RW
TBS33 TS 02 RW
TBS33 TS 03 RW
TBS33 TS 04 RW LSS004 DSN2SQL H(IS,S,C)
TBS33 TS 04 RW LSS005 DSN2SQL H(IS,S,C)
***** DISPLAY OF DATABASE CB3 ENDED *****

```

**Example 3:** Display information about table space TBS33 in database CB3. CLAIMERS displays claim types and durations; LUWIDs and locations of any remote threads; and *connection-name*, *correlation-id*, and *authorization ID* information.

```
-DISPLAY DATABASE(CB3) SPACENAM(TBS33) CLAIMERS
```

The following output is generated:

## -DISPLAY DATABASE (DB2)

```

DSNT360I - *****
DSNT361I - * DISPLAY DATABASE SUMMARY
 * GLOBAL CLAIMERS
DSNT360I - *****
DSNT362I - DATABASE = CB3 STATUS = RW
 DBD LENGTH = 4028

DSNT397I -
NAME TYPE PART STATUS CONNID CORRID CLAIMINFO

TBS33 TS 01 RW
TBS33 TS 02 RW
TBS33 TS 03 RW
TBS33 TS 04 RW LSS001 DSN2SQL (RR,C)
TBS33 TS 04 RW LSS001 DSN2SQL (WR,C)
***** DISPLAY OF DATABASE CB3 ENDED *****

```

**Example 4:** In a data sharing environment, display information about locks held when the table space is defined with LOCKPART YES. The application identified as LSS001 on member DB1G has locked partitions 1 and 2. LSS002 on member DB2G has locked partitions 1 and 3. Partition 4 has no locks held on it.

```
-DISPLAY DATABASE(DSN8D51A) SPACENAM(TSPART) LOCKS
```

Output similar to the following is generated:

| NAME   | TYPE | PART | STATUS      | CONNID | CORRID  | LOCKINFO |
|--------|------|------|-------------|--------|---------|----------|
| TSPART | TS   | 01   | RO          | LSS001 | DSN2SQL | H-IS,P,C |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   | 01   | RO          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   | 01   | RO          | LSS002 | DSN2SQL | H-IS,P,C |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 01   | RO          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 02   | RW          | LSS001 | DSN2SQL | H-IS,P,C |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   | 02   | RW          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   | 03   | RW          | LSS002 | DSN2SQL | H-IS,P,C |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 03   | RW          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 04   | RW          |        |         |          |

If the table space is defined with LOCKPART NO, the display looks like this. The LOCKINFO field shows a value of S, indicating that this is a table space lock. If partitions are held in different statuses, those statuses are listed below the table space locks.

| NAME   | TYPE | PART | STATUS      | CONNID | CORRID  | LOCKINFO |
|--------|------|------|-------------|--------|---------|----------|
| TSPART | TS   |      |             | LSS001 | DSN2SQL | H-IS,S,C |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   |      |             | LSS002 | DSN2SQL | H-IS,S,C |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 01   | RO          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB1G   |         |          |
| TSPART | TS   | 02   | RW          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 03   | RW          |        |         | H-S,PP,I |
| -      |      |      | MEMBER NAME | DB2G   |         |          |
| TSPART | TS   | 04   | RW          |        |         |          |

**Example 5:** Display information about page sets in database DSNDB01 that have entries in the logical page list. Limit the number of messages displayed to the space available.

```
-DB1G DISPLAY DATABASE(DSNDB01) SPACENAM(*) LIMIT(*) LPL
```

Output similar to the following is generated:

```

DSNT361I -DB1G * DISPLAY DATABASE SUMMARY
 * GLOBAL LPL
DSNT360I -DB1G

DSNT362I -DB1G DATABASE = DSNDB01 STATUS = RW
 DBD LENGTH = 8000
DSNT397I -DB1G
NAME TYPE PART STATUS LPL PAGES

DBD01 TS RW,LPL,GRECP 000001,000004,00000C,000010

 000039-00003C
SPT01 TS RW
SCT02 TS RW
SYSLGRNG TS RW
SYSUTILX TS RW
SYSLGRNX TS RW,LPL,GRECP 000000-FFFFFF
DSNSCT02 IX RW
DSNSPT01 IX RW
DSNSPT02 IX RW
DSNLUX01 IX RW
DSNLUX02 IX RW
DSNLLX01 IX RW
DSNLLX02 IX RW
***** DISPLAY OF DATABASE DSNDB01 ENDED *****
DSN9022I -DB1G DSNTDDIS 'DISPLAY DATABASE' NORMAL COMPLETION
```

**Example 6:** Suppose that table space TSPART, which is in database DSN8D51A, is defined with the keyword LOCKPART NO, which means that DB2 does not do selective partition locking on TSPART. When you specify this command:

```
-DB1G DISPLAY DATABASE(DSN8D51A) SPACE(TSPART) PART(1,4) LOCKS
```

two applications are accessing TSPART, and the partitions have different statuses. In the output, DB2 displays the locks as table space locks, as shown here:

## -DISPLAY DATABASE (DB2)

| NAME   | TYPE | PART | STATUS | CONNID | CORRID  | LOCKINFO |
|--------|------|------|--------|--------|---------|----------|
| TSPART | TS   |      |        | LSS001 | DSN2SQL | H-IS,S,C |
| TSPART | TS   |      |        | LSS002 | DSN2SQL | H-IS,S,C |
| TSPART | TS   | 01   | RO     |        |         |          |
| TSPART | TS   | 04   | RW     |        |         |          |

**Example 7:** Suppose that you have executed the ALTER TABLESPACE statement on table space TSPART so that TSPART is now defined with LOCKPART YES. LOCKPART YES causes DB2 to do selective partition locking on TSPART. When you specify this command:

```
-DB1G DISPLAY DATABASE(DSN8D51A) SPACE(TSPART) PART(1:4) LOCKS
```

two applications are accessing TSPART. The application identified by connection ID LSS001 has locked partitions 1 and 2. The application identified by connection ID LSS002 has locked partitions 1 and 3. In the output, DB2 displays the locks as partition locks, as shown here:

| NAME   | TYPE | PART | STATUS | CONNID | CORRID  | LOCKINFO |
|--------|------|------|--------|--------|---------|----------|
| TSPART | TS   | 01   | RO     | LSS001 | DSN2SQL | H-IS,P,C |
| TSPART | TS   | 01   | RO     | LSS002 | DSN2SQL | H-IS,P,C |
| TSPART | TS   | 02   | RW     | LSS001 | DSN2SQL | H-IS,P,C |
| TSPART | TS   | 03   | RW     | LSS002 | DSN2SQL | H-IS,P,C |
| TSPART | TS   | 04   | RW     |        |         |          |

---

## -DISPLAY GROUP (DB2)

The DB2 command DISPLAY GROUP displays information about the data sharing group to which a DB2 subsystem belongs.

**Abbreviation:** -DIS GROUP

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group

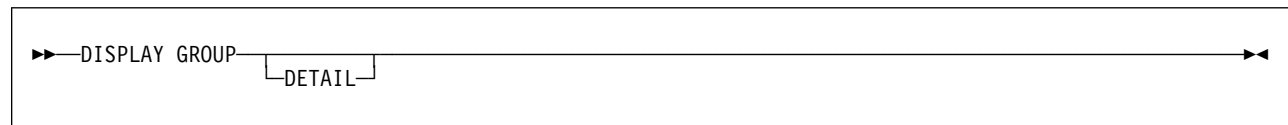
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- DISPLAY privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

**DETAIL**

Displays information about the parallelism coordinator and parallelism assistant.

### Usage Notes

**Member Status:** Message DSN7106I includes information about the XCF status of the members (STATUS in the display output). The status can be ACTIVE, QUIESCED, or FAILED.

ACTIVE indicates that the DB2 subsystem is active, and FAILED indicates that it is failed. A QUIESCED status results from a STOP DB2 command and consists of several subcategories:

**QUIESCED** This is a normal quiesced state, as the result of a normal STOP DB2 command.

**Q** Q (quiesced) can be paired with one or more of the following letters:

- I** Indoubt units of recovery (URs) are outstanding. This means retained locks are held.

## -DISPLAY GROUP (DB2)

- C** There was a castout error. The last updater of the page set or partition could not write from the coupling facility to DASD.

Make sure there are no connectivity problems between the coupling facility and the processor before restarting DB2.

- R** There is retained information needed for DB2 to perform resynchronization with one or more remote locations.

When DB2 is restarted, this resynchronization occurs.

**Using This Command in a Non-data-sharing Environment:** DB2 issues the same response, except for information which does not exist: group name, member name, and member ID.

## Output

**DISPLAY GROUP Command Output:** The DISPLAY GROUP command displays the following output:

```
*** BEGIN The name of the DB2 group
DB2 MEMBER The names of its members
ID The IDs of its members
SUBSYS The subsystem names of its members
CMDPREF The command prefix for each member
STATUS The status of each member (ACTIVE, QUIESCED with or without
 additional conditions, or FAILED)
SYSTEM NAME
 The names of the MVS system where the member is running, or
 was last running in cases when the member status is QUIESCED
 or FAILED
IRLM SUBSYS The name of the IRLM subsystem to which the DB2 member is
 connected
IRLMPROC The procedure names of the connected IRLM
SYSTEM NAME
 The MVS system name where the data sharing member runs on.
LVL A string of three numeric characters that list as follows:
 • DB2 version
 • DB2 release
 • DB2 modification level
SCA The SCA structure size in KB and the percentage currently in use
LOCK1 The LOCK1 structure size in KB, and the percentage of the struc-
 ture size in use. This percentage is based on the maximum per-
 centage used of either the lock table or the modify lock list, the two
 parts of the lock structure.
 The display also shows the following:
 • The maximum number of lock entries possible for the lock
 table and how many of those lock entries are currently in use.
 This number is an approximate value.
```

- The maximum number of modify lock list entries and how many of those list entries are currently in use.

For more information about the lock table and the list of modify locks, see Chapter 7 of *Data Sharing: Planning and Administration*.

PARALLELISM COORDINATOR

Indicates whether this DB2 member can coordinate parallel processing.

PARALLELISM ASSISTANT

Indicates whether this DB2 member can assist with parallel processing.

If the output indicates that either the lock structure or SCA are 0% in use, that does not necessarily mean that the structure is empty. It could mean that the structures are very large and that the number of locks held or the number of records in the SCA is less than 1%.

**Description of Message DSN7101I:**

GROUP The name of the data sharing group

GROUP LEVEL

A string of three numeric characters that denotes:

- DB2 version
- DB2 release
- DB2 modification level

This is the highest release with which any DB2 in the data sharing group have been started.

## Examples

**Example 1:** The following sample output for a data sharing group can be generated by the command:

-DB1A DIS GROUP

```

DSN7100I -DB1A DSN7GCM
*** BEGIN DISPLAY OF GROUP(DSNDB10) GROUP LEVEL(510)
 GROUP ATTACH NAME(DB10)

DB2 DB2 SYSTEM IRLM
MEMBER ID SUBSYS CMDPREF STATUS LVL NAME SUBSYS IRLMPROC

DB1A 1 DB1A -DB1A ACTIVE 510 MVSA DJ1A DB1AIRLM
DB1B 2 DB1B -DB1B ACTIVE 510 MVSB DJ1B DB1BIRLM
DB1C 3 DB1C -DB1C ACTIVE 510 MVSC DJ1C DB1CIRLM
DB1D 4 DB1D -DB1D FAILED 510 MVSD DJ1D DB1DIRLM
DB1E 5 DB1E -DB1E QUIESCED 510 MVSE DJ1E DB1EIRLM
DB1F 6 DB1F -DB1F ACTIVE 510 MVSF DJ1F DB1FIRLM
DB1G 7 DB1G -DB1G ACTIVE 510 MVSG DJ1G DB1GIRLM

SCA STRUCTURE SIZE: 1024 KB, STATUS= AC, SCA IN USE: 11 %
LOCK1 STRUCTURE SIZE: 1536 KB, LOCK1 IN USE: < 1 %
NUMBER LOCK ENTRIES: 262144
NUMBER LIST ENTRIES: 7353, LIST ENTRIES IN USE: 0
*** END DISPLAY OF GROUP(DSNDB10)
DSN9022I -DB1A DSN7GCM 'DISPLAY GROUP ' NORMAL COMPLETION

```

## -DISPLAY GROUP (DB2)

**Example 2:** In a non-data-sharing environment, the following sample output is generated by the command:

```
-DB1A DISPLAY GROUP
```

```
DSN7100I -DB1A DSN7GCMD
*** BEGIN DISPLAY OF GROUP(.....) GROUP LEVEL(...)
 GROUP ATTACH NAME(....)

DB2 DB2 SYSTEM IRLM
MEMBER ID SUBSYS CMDPREF STATUS LVL NAME SUBSYS IRLMPROC

..... 0 DB1A -DB1A ACTIVE 510 MVSA DJ1A DB1AIRLM

*** END DISPLAY OF GROUP(DSNDB10)
DSN9022I -DB1A DSN7GCMD 'DISPLAY GROUP ' NORMAL COMPLETION
```

**Example 3:** Using the DETAIL option, you can obtain more information about the data sharing group as shown in the following example using the command:

```
-DB1A DIS GROUP DETAIL
```

```
DSN7100I -DB1A DSN7GCMD
*** BEGIN DISPLAY OF GROUP(DSNCAT) GROUPELVEL(510)

DB2 SYSTEM IRLM
MEMBER ID SUBSYS CMDPREF STATUS NAME LVL SUBSYS IRLMPROC

DB1A 1 DB1A -DB1A ACTIVE MVSA 510 AR21 ARLM21
DB1B 2 DB1B -DB1B ACTIVE MVSB 510 BR21 BRLM21
DB1C 3 DB1C -DB1C ACTIVE MVSC 410 CRLM CRLM21
DB2D 4 DB2D -DB2D FAILED MVSD 510 DR21 DRLM21
DB2E 5 DB2E -DB2E QUIESCED MVSE 510 ER21 ERLM21
DB2F 6 DB2F -DB2F ACTIVE MVSF 510 FR21 FRLM21
DB2G 7 DB2G -DB2G ACTIVE MVSG 510 GR21 GRML21

DB2 PARALLEL PARALLEL
MEMBER COORDINATOR ASSISTANT

DB2A YES NO
DB2B YES YES
DB2B YES YES
DB1C **** ****
DB2D **** ****
DB2E **** ****
DB2F NO YES
DB2G NO NO

SCA STRUCTURE SIZE: 1024 KB, STATUS= AC, SCA IN USE: 11 %
LOCK1 STRUCTURE SIZE: 1536 KB, LOCK1 IN USE: < 1 %
NUMBER LOCK ENTRIES: 262144, LOCK ENTRIES IN USE: 33
NUMBER LIST ENTRIES: 7353, LIST ENTRIES IN USE: 0
*** END DISPLAY OF GROUP(DSNCAT)
DSN9022I -DB1A DSN7GCMD 'DISPLAY GROUP ' NORMAL COMPLETION
```



## -DISPLAY GROUPBUFFERPOOL (DB2)

The DB2 command DISPLAY GROUPBUFFERPOOL displays information about the status of DB2 group buffer pools. It can also display related statistics.

**Abbreviation:** -DIS GBPOOL

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group

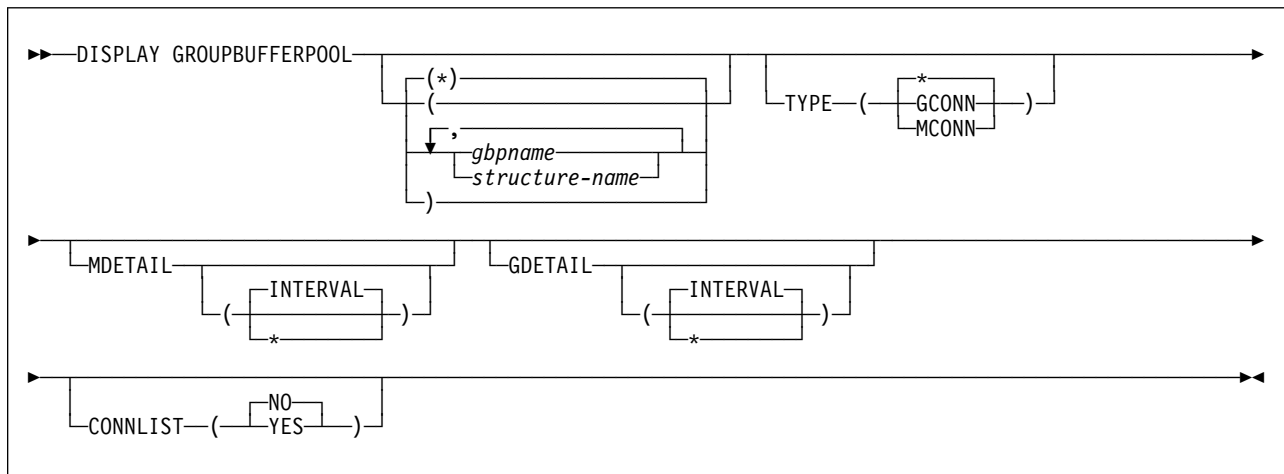
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- DISPLAY privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

(\*) Displays the group buffer pool status for all group buffer pools.

*gbpname*

Names the group buffer pool for which status is to be displayed.

- 4KB group buffer pools are named GBP0, GBP1, ..., GBP49
- 32KB group buffer pools are named GBP32K, GBP32K1, ... , GBP32K9

## -DISPLAY GROUPBUFFERPOOL (DB2)

### *(structure-name)*

Names the backing coupling facility structure for the group buffer pool. The coupling facility structure name has the following format:

*groupname\_gbpname*

where *groupname* is the DB2 data sharing group name and the underscore (\_) separates *groupname* and *gbpname*.

### **TYPE**

Tells the type of group buffer pools among those specified for which information is displayed.

(\*) All group buffer pools specified.

### **(GCONN)**

Group buffer pools that are currently connected to any member of the data sharing group. The connection can be "active" or "failed-persistent."

### **(MCONN)**

Group buffer pools that are currently connected to the member to which the command is directed.

### **CONNLIST**

Specifies whether a connection list report is shown for the specified group buffer pools, listing the connection names of the subsystems that are currently connected to the group buffer pools and their connection status.

### **(NO)**

Do not show the connection list report. This is the default.

### **(YES)**

Show the connection list report.

### **MDETAIL**

Shows a detailed statistical report for the specified group buffer pools, reflecting the member's activity for each group buffer pool. If the member to which the command is directed has never been actively connected to the group buffer pool, no detail report is shown.

### **(INTERVAL)**

Shows incremental statistics. The values displayed are accumulated since the last MDETAIL(INTERVAL) report for this member, if there was one. This is the default.

(\*) Shows cumulative statistics. The values displayed are accumulated since this member first connected to the group buffer pool.

### **GDETAIL**

Shows a detailed statistical report for the specified group buffer pools, reflecting the activity of the entire group for each group buffer pool. If the member to which the command is directed is not actively connected to the group buffer pool, no detail report is shown.

### **(INTERVAL)**

Shows incremental statistics. The values displayed are accumulated since the last GDETAIL(INTERVAL) report, if there was one. This is the default.

(\*) Shows cumulative statistics. The values displayed are accumulated since the group buffer pool was most recently allocated or re-allocated.

## Output

There are three report types:

- A summary report
- A group detail report
- A member detail report

These reports are described here.

### Summary Report

You can display summary information about group buffer pools. The report indicates whether this DB2 is actively connected to the group buffer pools you requested information for. The summary report also shows the following information:

#### **Group Buffer Pool Characteristics:**

- Threshold values
- Directory-to-data entry ratio (both pending and current)
- Checkpoint interval
- Recovery status (whether damage assessment is pending)

#### **CFRM Policy Information about the Group Buffer Pool:**

- The allocation value specified in the CFRM policy and whether the group buffer pool is currently allocated in the coupling facility.
- The actual allocated size (which can be different from that specified in the CFRM policy) and volatility status. DB2 requests non-volatile storage; however, it can allocate in a volatile structure.
- The actual number of directory entries, data pages, and connection to the group buffer pool.

The summary report contains additional information as follows:

#### AUTOMATIC RECOVERY

Indicates whether automatic recovery is allowed for this group buffer pool.

#### DUPLEX

Indicates the current option for the group buffer pool that is specified in the active CFRM policy.

#### REBUILD STATUS

Indicates whether a rebuild is in progress for this group buffer pool. If so, the phase of the rebuild is indicated: QUIESCE, CONNECT, or CLEANUP. If the rebuild is in the process of stopping, the status indicates STOPPING.

#### DUPLEXING STATUS

Indicates the current state of the group buffer pool with respect to duplexing.

#### CFNAME, CFLEVEL

Indicates the name and level of the coupling facility in which the group buffer pool is allocated. If the group buffer pool is duplexed,

|  
|  
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#  
#  
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#  
#  
#  
#  
#  
#

## -DISPLAY GROUPBUFFERPOOL (DB2)

# this is the coupling facility name and level associated with the  
# primary group buffer pool.

### LASTGROUP BUFFER POOL CHECKPOINT

| Indicates the date and time of the last group buffer pool check-  
| point, the LRSN that was recorded at that checkpoint, and the  
| member name of the group buffer pool structure owner.

### Group Detail Report

The group detail report shows detailed statistical information reflecting the activity of the entire group for the specified group buffer pools. This statistical information is helpful in tuning the size and other characteristics of group buffer pools. See Chapter 7 of *Data Sharing: Planning and Administration* for more information about using this information. The report includes the same information as in the summary report with the addition of the following:

READS Information about reads.

This is a detailed accounting of the number of reads against the group buffer pool, including the following:

- The number of reads where data was returned.
- The number of reads where data was not returned, broken down to include more detailed information about whether the page was cached in the coupling facility or not, and whether directory entries needed to be created to fulfill requests for data.

WRITES Information about writes.

This includes the number of writes for clean pages and changed pages, and how many writes failed because there was not enough storage in the group buffer pool.

CHANGED PAGES SNAPSHOT VALUE

The number of changed pages currently in the group buffer pool (a snapshot value).

RECLAIMS The number of reclaims of directory entries and data pages.

CASTOUTS The number of castouts.

CROSS INVALIDATIONS

The number of cross-invalidations that occurred because of directory reclaims and because of writes.

# DUPLEXING STATISTICS FOR GBP0-SEC

# This section of the output lists details of other interactions that this  
# DB2 has with this group buffer pool.

# CHANGED PAGES

# Indicates the number of changed pages written to the sec-  
# ondary group buffer pool. This number approximates the sum  
# of the synchronous writes of changed pages to the primary  
# group buffer pool and the asynchronous writes of changed  
# pages to the primary group buffer pool. The counts may not  
# be exactly the same, due to timing periods for gathering the  
# counter information for display or previous transaction failures  
# that may have occurred.

# FAILED DUE TO LACK OF STORAGE  
# Indicates the number of writes to the secondary group buffer  
# pool that failed due to a lack of storage.  
#  
# COMPLETION CHECKS SUSPENDED  
# Indicates the number of times DB2 checked for the completion  
# of the write of a changed page to the secondary group buffer  
# pool, but the write had not yet completed; DB2 suspends the  
# execution unit until the write to the secondary group buffer  
# pool completes.

### **Member Detail Report**

The member detail report includes the summary report and additional information about how a particular member's system is responding to the current environment. It categorizes reads and writes as synchronous or asynchronous. A large number of synchronous reads or writes can indicate that you need to tune your group buffer pools.

#### **GBP CHECKPOINTS TRIGGERED**

The number of checkpoints that occurred for this group buffer pool.

#### **PARTICIPATION IN REBUILD**

The number of times this member participated in a rebuild for this group buffer pool.

#### **CASTOUTS**

This section of output indicates detailed statistics for castout processing as follows:

##### **PAGES CAST OUT**

Indicates how many data pages were cast out of the group buffer pool by this member.

##### **UNLOCK CASTOUT**

The number of times that DB2 issued an unlock request to the coupling facility for castout I/Os that completed. As pages are cast out to DASD, they are "locked for castout" in the coupling facility. The castout lock ensures that only one system is doing castout for a given page.

DB2 usually includes multiple pages in the write I/O request to DASD for castout. Therefore, the UNLOCK CASTOUT counter should always be less than or equal to the value of the PAGES CASTOUT counter; it should be significantly less if multiple pages are written per I/O. For example, if there are 4 pages written per castout write I/O on average, then PAGES CASTOUT should be four times larger than UNLOCK CASTOUT.

##### **READ CASTOUT CLASS**

Number of requests made to the group buffer pool to determine which pages belonging to a given page set or partition are cached in the group buffer pool as changed pages and thus need to be cast out.

READ CASTOUT CLASS is issued by the page set or partition castout owner, and it is also issued by the group buffer pool structure owner when the GBPOOLT threshold has been reached.

### READ CASTOUT STATISTICS

The number of requests that are issued by the group buffer pool structure owner when the GBPOOLT threshold is reached. This determines which castout classes have changed pages. Generally READ CASTOUT STATISTICS is issued only once or twice for each occurrence of the GBPOOLT threshold.

### READ DIRECTORY INFO

The number of requests to read the directory entries of all changed pages in the group buffer pool. The group buffer pool structure owner issues these requests at group buffer pool checkpoints. The purpose of the request is to determine the oldest recovery LRSN to use in case the group buffer pool fails. This recovery LRSN is displayed in message DSNB798I.

The request to read directory information might be issued several times for each group buffer pool checkpoint. If you see an abnormally high number here, it might be that the requests are being cut short by the model-dependent timeout criteria of the coupling facility. To help alleviate this problem, upgrade those coupling facilities to CFLEVEL=2 or above.

### OTHER INTERACTIONS

This section of the output lists details of other interactions that this DB2 has with this group buffer pool.

#### REGISTER PAGE

The number of times that DB2 registered interest to the group buffer pool for a single page. These are register-only requests, meaning that DB2 is not requesting that any data be returned for the page because it knows that there is no data cached in the group buffer pool for this page. The REGISTER PAGE request is made only to create a directory entry for the page for cross-invalidation when downgrading the P-lock on a page set or partition from S mode to IS mode, or from SIX mode to IX mode.

#### UNREGISTER PAGE

The number of times that DB2 reversed registered interest from the group buffer pool for a single page. This is generally done as DB2 uses pages from the local buffer pool that belong to partitions or pagesets that are group buffer pool dependent.

#### DELETE NAME

The number of times that DB2 issued a request to the group buffer pool to delete directory and data entries that were associated with a given page set or partition. DB2 issues this request:

- When it converts a page set or partition from group buffer pool dependent to non group buffer pool dependent.
- When the first DB2 member opens the object for GBPCACHE ALL objects.

READ STORAGE STATS

The number of times that DB2 requested statistics information from the group buffer pool. This number should usually be relatively low. It is issued once per group buffer pool checkpoint by the group buffer pool structure owner. It is also issued for DISPLAY GROUPBUFFERPOOL GDETAIL requests and to record IFCID 0254.

Examples

Example 1: This is an example of a summary report that can be produced by the following command:

-DB1G DISPLAY GROUPBUFFERPOOL(GBP0)

```

DSNB750I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 FOLLOWS
DSNB755I DB1G DB2 GROUP BUFFER POOL STATUS
CONNECTED = YES
CURRENT DIRECTORY TO DATA RATIO = 5
PENDING DIRECTORY TO DATA RATIO = 5
DSNB756I DB1G CLASS CASTOUT THRESHOLD = 10%
GROUP BUFFER POOL CASTOUT THRESHOLD = 50%
GROUP BUFFER POOL CHECKPOINT INTERVAL = 8 MINUTES
RECOVERY STATUS = NORMAL
AUTOMATIC RECOVERY = Y
DSNB757I DB1G MVS CFM POLICY STATUS FOR DSNCAT_GBP0 = NORMAL
MAX SIZE INDICATED IN POLICY = 32768 KB
DUPLEX INDICATOR IN POLICY = ENABLED
CURRENT DUPLEXING MODE = DUPLEX
ALLOCATED = YES
DSNB758I DB1G ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
REBUILD STATUS = DUPLEXED
CFNAME = LF01
CFLEVEL = 7
DSNB759I DB1G NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
NUMBER OF CONNECTIONS = 2
DSNB798I DB1G LAST GROUP BUFFER POOL CHECKPOINT 16:41:37 JUL 19, 1999
GBP CHECKPOINT RECOVERY LRSN = B291A05BD469
STRUCTURE OWNER = V51A
DSNB799I DB1G SECONDARY GBP ATTRIBUTES
ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
CFNAME = CACHE01
CFLEVEL = 7
NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
DSNB790I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 IS COMPLETE
DSN9022I DB1G DSNB1CMD '-DIS GBPOOL' NORMAL COMPLETION

```

Example 2: Assume you want a summary report about group buffer pool zero, including all connections to that group buffer pool. Enter the following command:

-DB1G DISPLAY GROUPBUFFERPOOL(GBP0) CONNLIST(YES)

## -DISPLAY GROUPBUFFERPOOL (DB2)

```
| Here is what the display might look like:
DSNB750I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 FOLLOWS
DSNB755I DB1G DB2 GROUP BUFFER POOL STATUS
CONNECTED = YES
CURRENT DIRECTORY TO DATA RATIO = 5
PENDING DIRECTORY TO DATA RATIO = 5
DSNB756I DB1G CLASS CASTOUT THRESHOLD = 10%
GROUP BUFFER POOL CASTOUT THRESHOLD = 50%
GROUP BUFFER POOL CHECKPOINT INTERVAL = 8 MINUTES
RECOVERY STATUS = NORMAL
AUTOMATIC RECOVERY = Y
DSNB757I DB1G MVS CFMR POLICY STATUS FOR DSNCAT_GBP0 = NORMAL
MAX SIZE INDICATED IN POLICY = 32768 KB
DUPLEX INDICATOR IN POLICY = ENABLED
CURRENT DUPLEXING MODE = DUPLEX
ALLOCATED = YES
DSNB758I DB1G ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
REBUILD STATUS = DUPLEXED
CFNAME = LF01
CFLEVEL = 7
DSNB759I DB1G NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
NUMBER OF CONNECTIONS = 2
DSNB798I DB1G LAST GROUP BUFFER POOL CHECKPOINT 16:41:37 JUL 19, 1999
GBP CHECKPOINT RECOVERY LRSN = B291A05BD469
STRUCTURE OWNER = V51A
DSNB799I DB1G SECONDARY GBP ATTRIBUTES
ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
CFNAME = CACHE01
CFLEVEL = 7
NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
DSNB766I DB1G THE CONNLIST REPORT FOLLOWS
DSNB767I DB1G CONNECTION NAME = DB2_V51A , CONNECTION STATUS = D
CONNECTOR'S RELEASE = 5100
DSNB767I DB1G CONNECTION NAME = DB2_V51B , CONNECTION STATUS = D
CONNECTOR'S RELEASE = 5100
DSNB769I DB1G THE CONNLIST REPORT IS COMPLETE
DSNB790I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 IS COMPLETE
DSN9022I DB1G DSNB1CMD '-DIS GBP00L' NORMAL COMPLETION
```

**Example 3:** This example shows a group detail report that is produced by the command:

```
-DB1G DISPLAY GROUPBUFFERPOOL(GBP0) GDETAIL(*)
```



## -DISPLAY GROUPBUFFERPOOL (DB2)

```
DSNB750I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 FOLLOWS
DSNB755I DB1G DB2 GROUP BUFFER POOL STATUS
CONNECTED = YES
CURRENT DIRECTORY TO DATA RATIO = 5
PENDING DIRECTORY TO DATA RATIO = 5
DSNB756I DB1G CLASS CASTOUT THRESHOLD = 10%
GROUP BUFFER POOL CASTOUT THRESHOLD = 50%
GROUP BUFFER POOL CHECKPOINT INTERVAL = 8 MINUTES
RECOVERY STATUS = NORMAL
AUTOMATIC RECOVERY = Y
DSNB757I DB1G MVS CFRM POLICY STATUS FOR DSNCAT_GBP0 = NORMAL
MAX SIZE INDICATED IN POLICY = 32768 KB
DUPLEX INDICATOR IN POLICY = ENABLED
CURRENT DUPLEXING MODE = DUPLEX
ALLOCATED = YES
DSNB758I DB1G ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
REBUILD STATUS = DUPLEXED
CFNAME = LF01
CFLEVEL = 7
DSNB759I DB1G NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
NUMBER OF CONNECTIONS = 2
DSNB798I DB1G LAST GROUP BUFFER POOL CHECKPOINT 16:41:37 JUL 19, 1999
GBP CHECKPOINT RECOVERY LRSN = B291A05BD469
STRUCTURE OWNER = V51A
DSNB799I DB1G SECONDARY GBP ATTRIBUTES
ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
CFNAME = CACHE01
CFLEVEL = 7
NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
DSNB783I DB1G CUMULATIVE GROUP DETAIL STATISTICS SINCE 16:41:23 JUL 19, 1999
DSNB784I DB1G GROUP DETAIL STATISTICS
READS
DATA RETURNED = 0
DSNB785I DB1G DATA NOT RETURNED
DIRECTORY ENTRY EXISTED = 0
DIRECTORY ENTRY CREATED = 6
DIRECTORY ENTRY NOT CREATED = 0, 0
DSNB786I DB1G WRITES
CHANGED PAGES = 4
CLEAN PAGES = 0
FAILED DUE TO LACK OF STORAGE = 0
CHANGED PAGES SNAPSHOT VALUE = 0
DSNB787I DB1G RECLAIMS
FOR DIRECTORY ENTRIES = 0
FOR DATA ENTRIES = 0
CASTOUTS = 2
DSNB788I DB1G CROSS INVALIDATIONS
DUE TO DIRECTORY RECLAIMS = 0
DUE TO WRITES = 1
DSNB762I DB1G DUPLEXING STATISTICS FOR GBP0-SEC
WRITES
CHANGED PAGES = 4
FAILED DUE TO LACK OF STORAGE = 0
CHANGED PAGES SNAPSHOT VALUE = 0
DSNB790I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 IS COMPLETE
DSN9022I DB1G DSNB1CMD '-DIS GBPOOL' NORMAL COMPLETION
```

## -DISPLAY GROUPBUFFERPOOL (DB2)

**Example 4:** This example shows the member detail section from the report that is produced by the command:

```
-DB1G DISPLAY GROUPBUFFERPOOL(GBP0) MDETAIL(*)
```

```
DSNB750I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 FOLLOWS
DSNB755I DB1G DB2 GROUP BUFFER POOL STATUS
CONNECTED = YES
CURRENT DIRECTORY TO DATA RATIO = 5
PENDING DIRECTORY TO DATA RATIO = 5
DSNB756I DB1G CLASS CASTOUT THRESHOLD = 10%
GROUP BUFFER POOL CASTOUT THRESHOLD = 50%
GROUP BUFFER POOL CHECKPOINT INTERVAL = 8 MINUTES
RECOVERY STATUS = NORMAL
AUTOMATIC RECOVERY = Y
DSNB757I DB1G MVS CFPM POLICY STATUS FOR DSNCAT_GBP0 = NORMAL
MAX SIZE INDICATED IN POLICY = 32768 KB
DUPLEX INDICATOR IN POLICY = ENABLED
CURRENT DUPLEXING MODE = DUPLEX
ALLOCATED = YES
DSNB758I DB1G ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
REBUILD STATUS = DUPLEXED
CFNAME = LF01
CFLEVEL = 7
DSNB759I DB1G NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
NUMBER OF CONNECTIONS = 2
DSNB798I DB1G LAST GROUP BUFFER POOL CHECKPOINT 16:41:37 JUL 19, 1999
GBP CHECKPOINT RECOVERY LRSN = B291A05BD469
STRUCTURE OWNER = V51A
DSNB799I DB1G SECONDARY GBP ATTRIBUTES
ALLOCATED SIZE = 5120 KB
VOLATILITY STATUS = VOLATILE
CFNAME = CACHE01
CFLEVEL = 7
NUMBER OF DIRECTORY ENTRIES = 4518
NUMBER OF DATA PAGES = 901
DSNB772I DB1G CUMULATIVE MEMBER DETAIL STATISTICS SINCE 16:41:25 JUL 19, 1999
```

## -DISPLAY GROUPBUFFERPOOL (DB2)

```
DSNB773I DB1G MEMBER DETAIL STATISTICS
SYNCHRONOUS READS
DUE TO BUFFER INVALIDATION
DATA RETURNED = 0
DATA NOT RETURNED = 0
DSNB774I DB1G DUE TO DATA PAGE NOT IN BUFFER POOL
DATA RETURNED = 0
DATA NOT RETURNED = 0
DSNB775I DB1G PREFETCH READS
DATA NOT RETURNED = 0
REGISTER PAGE LIST NOT AVAILABLE
DATA RETURNED = 0
DSNB789I DB1G REGISTER PAGE LIST = 0
RETRIEVE CHANGED PAGES = 0
RETRIEVE CLEAN PAGES = 0
FAILED READS DUE TO LACK OF STORAGE = 0
DSNB776I DB1G SYNCHRONOUS WRITES
CHANGED PAGES = 4
CLEAN PAGES = 0
DSNB777I DB1G ASYNCHRONOUS WRITES
CHANGED PAGES = 0
CLEAN PAGES = 0
FAILED WRITES DUE TO LACK OF STORAGE = 0
DSNB778I DB1G CASTOUT THRESHOLDS DETECTED
FOR CLASSES = 0
FOR GROUP BUFFER POOL = 0
GBP CHECKPOINTS TRIGGERED = 2
PARTICIPATION IN REBUILD = 1
DSNB796I DB1G CASTOUTS
PAGES CASTOUT = 2
UNLOCK CASTOUT = 2
READ CASTOUT CLASS = 2
READ CASTOUT STATISTICS = 2
READ DIRECTORY INFO = 0
DSNB779I DB1G ENGINES NOT AVAILABLE
FOR CASTOUT = 0
FOR WRITING = 0
DSNB797I DB1G OTHER INTERACTIONS
REGISTER PAGE = 0
UNREGISTER PAGE = 0
DELETE NAME = 0
READ STORAGE STATISTICS = 41
DSNB764I DB1G DUPLEXING STATISTICS FOR GBP0-SEC
WRITES
CHANGED PAGES = 4
FAILED DUE TO LACK OF STORAGE = 0
DSNB793I DB1G DELETE NAME LIST = 2
READ CASTOUT STATISTICS = 0
DELETE NAME = 0
DSNB790I DB1G DISPLAY FOR GROUP BUFFER POOL GBP0 IS COMPLETE
DSN9022I DB1G DSNB1CMD '-DIS GBPOOL' NORMAL COMPLETION
```

## -DISPLAY LOCATION (DB2)

---

## -DISPLAY LOCATION (DB2)

If you specify the `DETAIL` option, which is optional, each line could be followed by information regarding conversations owned by DB2 system threads that are communicating with the location.

The information returned by the `DISPLAY LOCATION` command reflects a dynamic status. By the time the information is displayed, it is possible that the status has changed.

**Abbreviation:** -DIS LOC

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

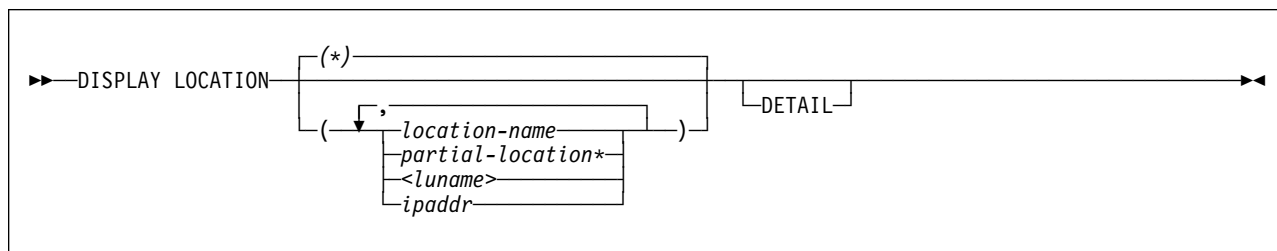
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- `DISPLAY` privilege
- `SYSOPR`, `SYSCTRL`, or `SYSADM` authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

*(location-name)*

Lists one or more location names, separated by commas. If *location-name* is not specified, information for all remote locations is displayed.

Because DB2 does not receive a location name from requesters that are not DB2 for OS/390 subsystems, you can enter the LUNAME or IP address of such a requester. Enclose the LUNAME by the less-than (<) and greater-than (>) symbols. Enter the IP address in the form *nnn.nnn.nnn.nnn*. For example, `-DISPLAY LOCATION(<LULA>)` displays information about a remote location (that is not DB2 for OS/390) with the LUNAME of LULA.

-DISPLAY LOCATION(124.63.51.17) displays information about clients at the remote TCP/IP host whose dotted decimal IP address is 124.63.51.17.

**(*partial-location\**)**

Selects all location names that begin with the string *partial-location* and can end with any string, including the empty string. For example, LOCATION(ABC\*) selects all location names that begin with the string 'ABC'.

You can use an asterisk (\*) when specifying a LUNAME in the same manner as described above for location names that are not DB2 for OS/390 subsystems. For example, -DISPLAY LOCATION(<LULA\*) selects all remote locations (that are not DB2 for OS/390) with an LUNAME that begins with the string 'LULA'.

**(\*)** Displays information for all remote locations.

The **default** is (\*).

**<luname>**

Requests information about the remote clients that are connected to DDF through the remote SNA LU that is specified.

**(ipaddr)**

Requests information about the clients that are connected to DDF through the remote TCP/IP host. *nnn.nnn.nnn.nnn* is the dotted decimal IP address.

**DETAIL**

Displays additional information about conversation activity for DB2 system threads, as shown in Example 2 on page 136.

## Output

The DISPLAY LOCATION command displays the following output:

|               |                                                                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOCATION      | The LOCATION of the remote system.                                                                                                                                                                                                                              |
| PRDID         | The product identifier (PRDID) of the remote system. The PRDID is displayed in the form <i>nnnvrrm</i> , where:<br><i>nnn</i> The database product<br><i>vv</i> The product version<br><i>rr</i> The product release<br><i>m</i> The product modification level |
| LINKNAME      | The address (LU name or IP address) of the remote system.                                                                                                                                                                                                       |
| REQUESTERS    | The number of active threads from the local subsystem that are accessing the remote system.                                                                                                                                                                     |
| SERVERS       | The number of threads from the remote system that are accessing the local subsystem.                                                                                                                                                                            |
| CONVERSATIONS | The total number of conversations or sockets related to the partner system.                                                                                                                                                                                     |

## -DISPLAY LOCATION (DB2)

### Examples

**Example 1:** Display information about threads and conversations with specific remote locations, using the following command:

```
-DISPLAY LOCATION(SAN_JOSE,SAN_FRANCISCO)
```

```
DSNL200I - DISPLAY LOCATION REPORT FOLLOWS-
LOCATION PRDID LINKNAME REQUESTERS SERVERS CONVS
SAN_JOSE DSN05010 LUND1 1 0 1
SAN_FRANCISCO DSN05010 LUND3 1 0 1
DISPLAY LOCATION REPORT COMPLETE
```

**Example 2:** Display information about threads and conversations with all remote locations. Additionally, display detail conversation information about DB2 system threads that communicate with other locations. This is an example of the output generated by the following command:

```
-DISPLAY LOCATION DETAIL
```

```
DSNL200I - DISPLAY LOCATION REPORT FOLLOWS-
LOCATION PRDID LINKNAME REQUESTERS SERVERS CONVS
SAN_JOSE DSN05010 LUND1 1 0 3
-SYSTASK SESSID A ST TIME
-SYSCON-O 00D359691359EE80 S 9128009214880
-SYSCON-I 00D359691359EE81 W R 9128009214881
MENLO_PARK DSN05010 LUND2 1 0 4
-SYSTASK SESSID A ST TIME
-SYSCON-O 00D359691359EE82 S 9128009214882
-SYSCON-I 00D359691359EE83 W R 9128009214883
-RESYNC 00D359691359EE84 V R 9128009214884
SAN_FRANCISCO DSN05010 LUND3 1 0 6
-SYSTASK SESSID A ST TIME
-SYSCON-O 0000000000000000 C 9128009214885
-SYSCON-I 00D359691359EE86 W R 9128009214886
-RESYNC 00D359691359EE87 W R 9128009214887
-RESYNC 00D359691359EE88 W R 9128009214888
-RESYNC 00D359691359EE89 W R 9128009214889
DISPLAY LOCATION REPORT COMPLETE
```

**Example 3:** Display information for a DB2 that is connected to the following DRDA partners:

- A non-MVS server named DRDALOC via TCP/IP.
- Several TCP/IP clients from the same TCP/IP host as the DRDALOC server.
- A DB2 for MVS server named DB2SERV via SNA.

```
DISPLAY LOCATION(*)
```

```
DSNL200I - DISPLAY LOCATION REPORT FOLLOWS -
LOCATION PRDID LINKNAME REQUESTERS SERVERS CONVS
DRDALOC SQL03030 124.63.51.17 3 0 3
124.63.51.17 SQL03030 124.63.51.17 0 15 15
DB2SERV DSN05010 LULA 1 0 1
DISPLAY LOCATION REPORT COMPLETE
```

**Example 4:** The following example assumes DB2 is connected to the following DRDA partners:

## -DISPLAY LOCATION (DB2)

- DB2A is connected to this DB2, using TCP/IP for DRDA connections and SNA for DB2 private protocol connections.
- DB2SERV is connected to this DB2 using only SNA.

DISPLAY LOCATION(\*)

DSNL200I - DISPLAY LOCATION REPORT FOLLOWS -

| LOCATION | PRDID    | LINKNAME     | REQUESTERS | SERVERS | CONVS |
|----------|----------|--------------|------------|---------|-------|
| DB2A     | DSN05010 | LUDB2A       | 3          | 4       | 9     |
| DB2A     | DSN05010 | 124.38.54.16 | 2          | 1       | 3     |
| DB2SERV  | DSN04010 | LULA         | 1          | 1       | 3     |

DISPLAY LOCATION REPORT COMPLETE

## -DISPLAY PROCEDURE (DB2)

---

### -DISPLAY PROCEDURE (DB2)

The DB2 command DISPLAY PROCEDURE displays statistics about stored procedures accessed by DB2 applications. This command displays one output line for each stored procedure that has been accessed by a DB2 application.

The information returned by the DISPLAY PROCEDURE command reflects a dynamic status. By the time the information is displayed, it is possible that the status could have changed.

**Abbreviation:** -DIS PROC

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or a CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

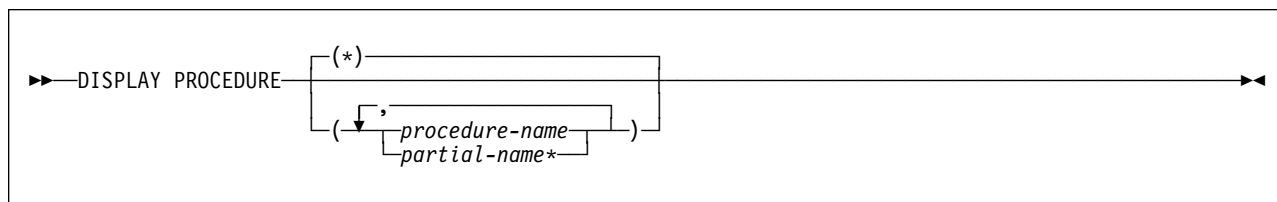
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- DISPLAY privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

*(procedure-name)*

Names one or more stored procedures to display. If no procedures are named, information is displayed for all stored procedures that have been accessed by DB2 applications.

*(partial-name\*)*

Displays information for a set of stored procedures. The names of all procedures in the set begin with *partial-name* and can end with any string, including the empty string. For example, ABC\* displays information for all stored procedures with names that begin with ABC.



(\*) Displays information for all stored procedures that have been accessed by DB2 applications since DB2 was started. This is the default.

## Output

**Sample Output:** The DISPLAY PROCEDURE command generates the following output:

DSNX940I - DSNX9DIS DISPLAY PROCEDURE REPORT FOLLOWS -

| PROCEDURE | MODULE   | STATUS  | ACTIVE | MAXACT | QUEUED | MAXQUE | TIMEOUT |
|-----------|----------|---------|--------|--------|--------|--------|---------|
| APPL1     | LOADM1   | STARTED | 1      | 1      | 0      | 0      | 0       |
| APPL2     | LOADM2   | STARTED | 1      | 2      | 0      | 0      | 0       |
| APPL2     | LOADM2B  | STARTED | 0      | 1      | 1      | 2      | 0       |
| APPL5     |          | STOPREJ | 0      | 0      | 0      | 0      | 0       |
| APPL6     | LOADMTST | STOPABN | 0      | 0      | 0      | 0      | 0       |
| PROC1     |          | STOPQUE | 0      | 0      | 0      | 0      | 0       |

DSNX9DIS DISPLAY PROCEDURE REPORT COMPLETE

**Description of Output:** Each output line displays:

PROCEDURE The name of the stored procedure.

MODULE The name of the MVS load module associated with the stored procedure. This field can contain blanks if the stored procedure request is queued and waiting for START PROCEDURE.

STATUS The status of the stored procedure of the stored procedure. The possible values are:

STARTED Requests for the procedure can be processed.

STOPQUE Requests are queued.

STOPREJ Requests are rejected.

STOPABN Requests are rejected because of abnormal termination.

ACTIVE The number of threads that are currently running the load module.

MAXACT The maximum number of threads that have run the load module concurrently since DB2 was started.

QUEUED The number of threads that are waiting for the procedure to be scheduled.

MAXQUE The maximum number of threads that have waited concurrently for the procedure to be scheduled since DB2 was started.

TIMEOUT The number of times an SQL CALL statement timed out while waiting for a request for the procedure to be scheduled.

Message DSNX943I lists a range of procedures that are stopped because a STOP PROCEDURE command included a partial name with a pattern character such as:

-STOP PROCEDURE(ABC\*)

Message DSNX950I is returned when DISPLAY PROCEDURE is issued for a procedure name that has not been accessed by a DB2 application.



---

## -DISPLAY RLIMIT (DB2)

The DB2 command DISPLAY RLIMIT displays the current status of the resource limit facility (governor). If the facility has already been started, -DISPLAY RLIMIT also displays the ID of the resource limit specification table being used.

**Abbreviation:** -DIS RLIM

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



```
▶—DISPLAY RLIMIT—◀
```

### Example

**Example:** Display the current status of the resource limit facility.

```
-DISPLAY RLIMIT
```

If the resource limit facility (RLF) is inactive, the following output is generated:

```
DSNT701I - RESOURCE LIMIT FACILITY IS INACTIVE
DSN9022I - DSNTCDIS 'DISPLAY RLIMIT' NORMAL COMPLETION
```

If the RLF is active, the value of field RESOURCE AUTHID on panel DSNTIPP is SYSADM, and the resource limit specification table with RLST NAME SUFFIX = 03 was started, the following output is generated:

```
DSNT700I = SYSADM.DSNRLST03 IS THE ACTIVE RESOURCE LIMIT
SPECIFICATION TABLE
DSN9022I = DSNTCDIS 'DISPLAY RLIMIT' NORMAL COMPLETION
```

## -DISPLAY THREAD (DB2)

---

### -DISPLAY THREAD (DB2)

The DB2 command DISPLAY THREAD displays current status information about DB2 threads. A DB2 thread is either an allied thread, a database access thread, or a parallel task thread. Threads can be active, inactive, or indoubt.

Distributed threads are those threads that have a connection with a remote location (active or inactive) or that had a connection with a remote location (indoubt). An allied thread and a parallel task thread can be distributed or nondistributed; a database access thread is always distributed.

The -DISPLAY THREAD command allows you to select the type of information you want to display by using one or more of the following criteria:

- Active threads, inactive threads, indoubt threads, or both active and indoubt threads (see discussion under the TYPE option for more information)
- The allied threads associated with the address spaces whose connection names are specified
- Allied threads
- Distributed threads
- Distributed threads associated with a specific remote location
- Detailed information about connections with remote locations
- A specific logical unit of work ID (LUWID)

The information returned by the DISPLAY THREAD command reflects a dynamic status. When the information is displayed, it is possible that the status has changed. Moreover, the information is consistent only within one address space and is *not necessarily* consistent across all address spaces displayed.

**Abbreviation:** -DIS THD

## Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

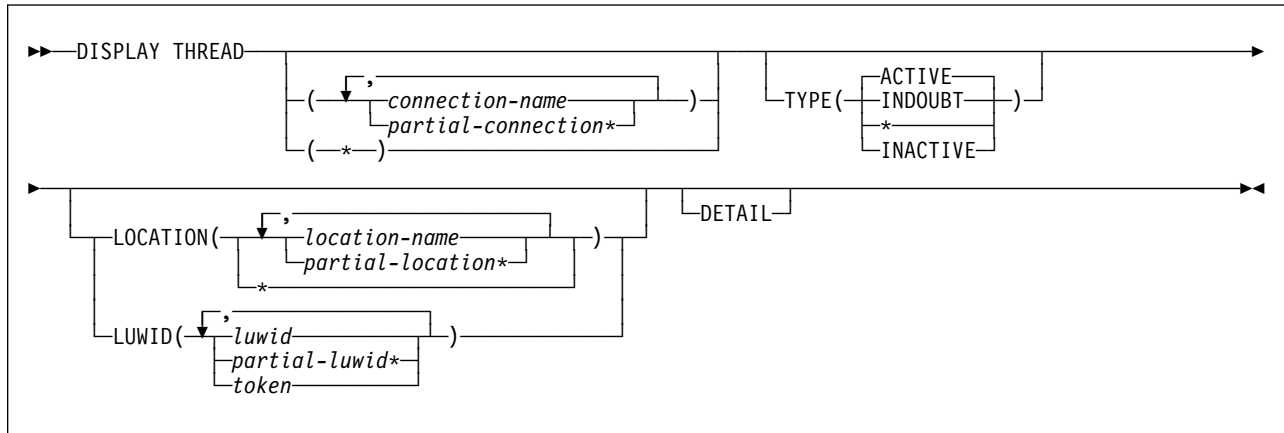
## Authorization

To execute this command, the privilege set of the process must include one of the following:

- DISPLAY privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

Only under certain conditions, as described below, are any of the following options required.

If neither (*connection-name*) nor (\*) is specified, then the following rules apply:

- If the command is issued from a DSN session under TSO, a DB2I panel (DB2 COMMANDS), or an IMS or CICS terminal, then the connection name is inherited from the associated address space.
- If the command is not issued from one of the above environments, then the following rules apply:
  - If neither LOCATION nor LUWID is specified, then processing terminates with a DSNV413I message.
  - If LOCATION or LUWID is specified, then only distributed threads of the type selected by the TYPE option are displayed.
  - When *location-name* is explicitly specified, then only distributed threads of the type selected by the TYPE option that either have (active or inactive threads) or had (indoubt threads) a connection with the specified location are displayed.

**(*connection-name*, ...)**

Lists one or more connection names (of 1 to 8 characters each). Allied threads are selected only from the address spaces associated with those connection names. The LOCATION option can restrict what is displayed:

- If LOCATION(\*) is specified, then only distributed threads of the type specified in the TYPE option are displayed.
- When *location-name* is explicitly specified, then only distributed threads of the specified type that either have (active or inactive threads) or had (indoubt threads) a connection with the specified location are displayed.

**(*partial-connection\**, ...)**

Selects the connections that begin with the string *partial-connection* and can end with any string, including the empty string. For example, DISPLAY THREAD(CICS\*,IMS\*) selects all connection names that begin with the string

## -DISPLAY THREAD (DB2)

'CICS' or 'IMS'. The LOCATION option can restrict the display exactly the same way as described above for *location-name*.

- (\*) Displays all threads in all address spaces attached to DB2 and all database access threads of the types specified in the TYPE option. The LOCATION option can restrict what is displayed:
  - If LOCATION(\*) is specified, then only distributed threads are displayed.
  - When *location-name* is explicitly specified, then only distributed threads that either have (active or inactive threads) or had (indoubt threads) a connection with the specified location are displayed.

The **default** is to display only the connections associated with the transaction manager from which the command was entered.

### TYPE

Tells what type of thread to display.

**Abbreviation:** T

#### **(ACTIVE)**

Displays only active threads. An active allied thread is connected to DB2 via TSO, BATCH, IMS, CICS or CAF. An active database access thread is connected via VTAM to another system and is performing work on behalf of that system. If, during command processing, an active thread becomes indoubt, it can appear twice—once as active and once as indoubt.

**Abbreviation:** A

The **default** is **TYPE(ACTIVE)**.

The information produced by ACTIVE can be useful for debugging purposes, especially messages DSNV403I and DSNV404I; the contents of those messages are described in Section 3 of *Messages and Codes* .

#### **(INDOUBT)**

Displays only indoubt threads.

An indoubt thread is a participant in a two-phase commit protocol that has completed the first phase of commit, and has then lost communication with the commit coordinator, and does not know whether to commit or roll back the updates that have been made.

The indoubt thread information displayed includes threads for which DB2 has a coordinator role, a participant role, or both coordinator and participant roles.

The commit coordinator for an allied thread is either a transaction manager (for example, IMS or CICS) or OS/390 RRS for threads that use RRSAF. The commit coordinator for a database access thread is a requester at a remote system.

Indoubt threads hold locks on all resources that were updated.

**Abbreviation:** I

- (\*) Displays both active and indoubt threads.

**(INACTIVE)**

Displays only inactive threads. An inactive thread is a database access thread that is connected via VTAM to another system and is idle, waiting for a new unit of work to begin from that system.

**Abbreviation:** INA

Use qualifiers such as complete location names or LUWIDs with this option. When there are large numbers of inactive database access threads, unqualified display requests could temporarily change the DB2 working set, which can temporarily affect the performance of active threads.

**LOCATION**(*location-name*, ...)

Limits the display to distributed threads as described below.

**Abbreviation:** LOC

*location-name*

Displays only distributed threads of the specified type that either have (active or inactive threads) or had (indoubt threads) a remote connection with the specified *location-name*.

DB2 does not receive a location name from requesters that are not DB2 for OS/390 subsystems. To display information about a requester that is not a DB2 for OS/390 subsystem, enter its LUNAME or IP address. Enclose the LUNAME by the less-than (<) and greater-than (>) symbols. Enter the IP address in the form *nnn.nnn.nnn.nnn*. For example, the following command displays information about a remote location (that is not DB2 for OS/390) with the LUNAME of LULA:

```
-DISPLAY THREAD (*) LOCATION (<LULA>)
```

The following command displays information about a remote location (that is not DB2 for OS/390) with an IP address of 123.34.101.98:

```
-DISPLAY THREAD (*) LOCATION (123.34.101.98)
```

DB2 uses the <LUNAME> notation or IP address in messages displaying information about requesters other than DB2.

*partial-location\**

Selects all location names that begin with the string *partial-location* and can end with any string, including the empty string. For example, LOCATION(SAN\*) selects all location names that begin with the string 'SAN'.

You can use an asterisk (\*) when specifying a LUNAME in the same manner as described above for other location names that are not DB2 for OS/390 subsystems. For example, LOCATION(<LULA\*) selects all remote locations (that are not DB2 for OS/390) with an LUNAME that begins with the string 'LULA'.

You cannot use an asterisk when you specify an IP address.

(\*) Display all distributed threads of the specified type.

**LUWID**(*luwid*, ...)

Displays information about the distributed threads that have the specified LUWID. It is possible for more than one thread to have the same LUWID.

## -DISPLAY THREAD (DB2)

### *luwid*

*luwid* consists of a fully qualified LU network name followed by a period and an LUW instance number.

The LU network name consists of a 1 to 8 character network ID, a period, and a 1 to 8 character network LU name. The LUW instance number consists of 12 hex characters that uniquely identify the unit of work.

### *partial-luwid\**

Selects all LUWIDs that begin with the string *partial-luwid* and can end with any string, including the empty string. For example, LUWID(NET1.\*) selects all LUWIDs with a network name of 'NET1'.

### *token*

A *token* is an alternate way to identify a specific thread. DB2 assigns a token to each distributed thread it creates. A token is a 1 to 5 digit decimal number that appears after the equal sign in all DB2 messages that display a LUWID.

If there are no periods nor a '\*' in the LUWID specification, DB2 assumes that you are supplying a token. The token that DB2 assigns to a specific LUWID is unique for that DB2 subsystem, but not necessarily unique across subsystems.

### DETAIL

Displays additional information about conversation or socket activity when distributed information is displayed for active or inactive threads. DETAIL has no effect on the display of indoubt threads.

## Usage Notes

**Formatted Report for Distributed Threads:** The series of messages DSNV444I through DSNV446I augment the formatted report for -DISPLAY THREAD TYPE(ACTIVE or INACTIVE) for distributed threads. See these messages in Section 3 of *Messages and Codes* for an explanation of the formatted report.

**Threads Using Private Protocol and DRDA access:** It is possible for a database access thread that is connected to an application requester using DRDA access to also be connected to a database access thread at another DB2 location using DB2 private protocol access. In this case, a DSNV445I message is issued for the application requester, and a DSNV444I message and 0 or more DSNV446I messages are issued for the remote connections that are using DB2 private protocol access to other DB2 subsystems.

**Participant Threads Waiting for the Commit/Abort Decision:** A DSNV465I message is issued for an active participant thread that has completed phase 1 of commit processing and has been waiting for the commit/abort decision from the coordinator for more than 60 seconds.

**DISPLAY THREAD Output Limit:** If a DISPLAY THREAD command is issued from the MVS console, the maximum number of lines of output for a single invocation of the command is 255 lines (at which time a DSNV421I or DSNV422I message is printed). If you do not receive the required information in the first 255 lines of output, issue the command again, specifying the TYPE option and a specific connection name, location, *luwid*, or a combination of these, as appropriate, to reduce the output.



**Showing Parallel Tasks:** The DB2 DISPLAY THREAD command shows parallel tasks by using a status type of PT. The parallel tasks are displayed immediately after the originating task. If the thread has a status of PT, the connection name contains blanks if the thread of the originating task is running on the same DB2. This shows that these parallel tasks are related to the originating task. If the parallel task is running on a DB2 that is different from the DB2 that runs the originating task, then the connection name is shown and the entry is followed by message DSNV443I.

## **Output**

Table 10 on page 148 shows sample -DISPLAY THREAD commands and the types of output they generate. The DETAIL keyword is not included because it affects only the amount of information displayed about a distributed thread.

## -DISPLAY THREAD (DB2)

Table 10. Sample DISPLAY THREAD commands. Output generated when commands are issued from different environments with different TYPE specifications. (Specifying TYPE(\*) displays the equivalent output of both TYPE(ACTIVE) and TYPE(INDOUBT) in one report.)

|                                                                                                               | ACTIVE | INDOUBT | INACTIVE |
|---------------------------------------------------------------------------------------------------------------|--------|---------|----------|
| <b>Command issued from a DSN session under TSO, DB2I, IMS or CICS, where the connection name is inherited</b> |        |         |          |
| -DIS THD                                                                                                      | 1      | 1       | 2        |
| -DIS THD LOC(*)                                                                                               | 3      | 3       | 2        |
| -DIS THD LOC( <i>location-name</i> )                                                                          | 4      | 4       | 2        |
| <b>Command issued from MVS console</b>                                                                        |        |         |          |
| -DIS THD                                                                                                      | 6      | 6       | 6        |
| -DIS THD LOC(*)                                                                                               | 9      | 9       | 8        |
| -DIS THD LOC( <i>location-name</i> )                                                                          | 10     | 10      | 11       |
| <b>Command issued from any source</b>                                                                         |        |         |          |
| -DIS THD( <i>connection-name</i> )                                                                            | 1,12   | 1,12,15 | 12       |
| -DIS THD( <i>connection-name</i> ) LOC(*)                                                                     | 3,12   | 3,12,15 | 12       |
| -DIS THD( <i>connection-name</i> ) LOC( <i>location-name</i> )                                                | 4,13   | 4,13,15 | 13       |
| -DIS THD(*)                                                                                                   | 7      | 7,15    | 8        |
| -DIS THD(*) LOC(*)                                                                                            | 9      | 9,15    | 8        |
| -DIS THD(*) LOC( <i>location-name</i> )                                                                       | 10     | 10,15   | 11       |
| -DIS THD(*) LUWID( <i>luwid</i> or <i>token</i> )                                                             | 5      | 5,15    | 5        |
| -DIS THD( <i>connection-name</i> ) LUWID( <i>luwid</i> or <i>token</i> )                                      | 14     | 14,15   | 14       |
| -DIS THD LUWID( <i>luwid</i> or <i>token</i> )                                                                | 5      | 5,15    | 5        |

### Description of display generated:

1. Allied threads of the specified TYPE with the connection name.
2. No threads (inactive threads are database access threads and have no inherited connection name).
3. Distributed allied threads of the specified TYPE with the connection name.
4. Distributed allied threads of the specified TYPE with the connection name and a distributed connection = *location-name*.
5. The threads of the specified TYPE that have LUWID = *luwid* or *token*.
6. Message DSNV413I is displayed to indicate an error,
7. All threads (both allied and database access) of the specified TYPE.
8. All inactive database access threads.
9. All distributed threads (both allied and database access) of the specified TYPE.
10. All distributed threads (both allied and database access threads) of the specified TYPE with a distributed connection = *location-name*.
11. All inactive database access threads with a distributed connection = *location-name*.
12. Database access threads of the specified TYPE with the connection name.
13. Database access threads of the specified TYPE with the connection name and a distributed connection = *location-name*.
14. A thread of the specified TYPE with the connection name and LUWID = *luwid* or *token*.
15. Messages DSNV407 and DSNV408 also display coordinator's TCP/IP resync port number; message DSNV446 also displays the participant's TCP/IP resync port number.

If the DETAIL option is specified, then the following additional information is displayed:

LOCATION The location name of the remote system.

SESSID For a VTAM connection, the VTAM defined session instance identifier of the session on which the conversation is executing.

For a TCP/IP connection, the local and remote TCP/IP port numbers, in the form *local:remote*. *local* is the port number for the local DB2 subsystem. *remote* is the port number for the remote partner.

A If VTAM has control of the conversation (if DB2 transferred control of the thread to VTAM for that conversation), there is a V in the A (Active) column. A W indicates that DB2 has suspended processing on this conversation until VTAM notifies DB2 that the VTAM event is complete. The column is otherwise blank.

STATUS This 2 byte column indicates the status of the conversation or socket. The possible values for STATUS are:

| Value | Status                                      |
|-------|---------------------------------------------|
| Sx    | Send                                        |
| Rx    | Receive                                     |
| Ax    | Allocation                                  |
| Dx    | Deallocation                                |
| Cx    | Change number of sessions (CNOS) processing |
| Xx    | Exchange Log name processing                |
| blank | Not in one of the above mentioned states    |

x can be one of the following values:

- 1 = private protocol conversation with single-phase commit
- 2 = DRDA conversation with single-phase commit
- 3 = private protocol conversation with two-phase commit
- 4 = DRDA conversation with two-phase commit.

## Examples

**Example 1:** The output of the command DISPLAY THREAD shows a token for every thread, distributed or not. This example shows the token for an allied thread that is not distributed. The token is 123. You can use the thread's token as the parameter in the command CANCEL THREAD.

-DIS THD(\*) DETAIL

DSNV401I - DISPLAY THREAD REPORT FOLLOWS -

DSNV402I - ACTIVE THREADS -

| NAME  | ST | A | REQ | ID    | AUTHID | PLAN | ASID | TOKEN |
|-------|----|---|-----|-------|--------|------|------|-------|
| BATCH | T  | * | 5   | BKH2C | SYSADM | BKH2 | 000D | 123   |

DISPLAY ACTIVE REPORT COMPLETE

DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION

## -DISPLAY THREAD (DB2)

**Example 2:** Requester. This example shows two database access threads. The first thread is connected to location SSURLOC in receive mode and is using DB2 private protocol access. The second thread is also connected to SSURLOC, but it is in send mode and is using DRDA access over SNA.

```
-DIS THD(*) LOCATION(*) DETAIL
```

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS -
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
IMS1 TR * 2 DSN2SQL SMITH DSN2SQL 0006 1
V444-STLDRIV.SSLU.A32712BC2A6E=1 ACCESSING DATA AT
V446-SSURLOC:SSURLU
V447--LOCATION SESSID A ST TIME
V448--SSURLOC 0000000200000002 V R3 9034816571103
CICS1 TR * 2 RUW2STAT JONES RUW2STAT 0007 2
V444-STLDRIV.SSLU.A3271393508D=2 ACCESSING DATA AT
V446-SSURLOC:SSURLU
V447--LOCATION SESSID A ST TIME
V448--SSURLOC 0000000400000004 V S4 9034817004652
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION
```

**Example 3:** In this example, a system at STL has a TSO application and an IMS application. The system at STL fails after DB2 commits the TSO application, but before the commit decision has been communicated to the participant subsystems at SJ and LA. The failure occurs before IMS has communicated the commit or rollback decision to STL's DB2. The DISPLAY THREAD commands that are issued after the STL DB2 restarts but before reconnect with IMS. DISPLAY THREAD commands that are issued at each location show the following:

At STL:

```
-DIS THD(*) TYPE(INDOUBT)
```

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV406I - INDOUBT THREADS -
COORDINATOR STATUS RESET URID AUTHID
STLIMS01 INDOUBT 0F201050A010 SM09H
V467-HAS LUWID IBM.STLDB21.15A86A876789.0010=1
V449-HAS NID=A5 AND ID=STLIMS01
V450-HAS PARTICIPANT INDOUBT AT
V446--IBMSJ0DB20001:STLDB22
IBMSTLDB20001 COMMITTED 0F20105B0000 J078S
V467-HAS LUWID IBM.STLDB21.16B57B954427.0003=2
V450-HAS PARTICIPANT INDOUBT AT
V446--IBMSJ0DB20001:STLDB22 IBMLA0DB20001:STLDB23
DISPLAY INDOUBT REPORT COMPLETE -
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION
```

At San Jose:

-DIS THD(\*) TYPE(INDOUBT)

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV406I - INDOUBT THREADS -
COORDINATOR STATUS RESET URID AUTHID
IBMSTLDB20001:STLDB21 INDOUBT 03201050A010 HEU4443
V467-HAS LUWID IBM.STLDB21.15A86A876789.0010=8
V466-THREAD HAS BEEN INDOUBT FOR 00:05:20
IBMSTLDB20001:STDB21 INDOUBT 03201050B000 PP433MM
V467-HAS LUWID IBM.STLDB21.16B57B954427.0003=6
DISPLAY INDOUBT REPORT COMPLETE
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION
```

At Los Angeles (both ACTIVE and INDOUBT threads are displayed):

-DIS THD(\*) TYPE(\*) DETAIL

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS -
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
SERVER RA * 0 RUW2STAT JONES DISTSERV 0005 4
V465-THREAD HAS BEEN PREPARED FOR 00:05:20
V445-IBM.STLDB21.15A86A876789=4 ACCESSING DATA FOR
 IBMSJ0DB20001:STLDB21
V447--LOCATION SESSID A ST TIME
V448--IBMSJ0DB20001 0000000400000004 W R4 9034817015032
DISPLAY ACTIVE REPORT COMPLETE
DSNV406I - INDOUBT THREADS -
COORDINATOR STATUS RESET URID AUTHID
IBMSTLDB20001:STLDB21 INDOUBT 03201050B000 SM43YY33
V467-HAS LUWID IBM.STLDB21.16B57B954427.0003=5
V466-THREAD HAS BEEN INDOUBT FOR 00:05:20
DISPLAY INDOUBT REPORT COMPLETE
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION
```

**Example 4:** This example shows a thread executing within a stored procedure and a thread waiting for a stored procedure to be scheduled. Assume that an application makes a call to stored procedure PROC1 and then to stored procedure PROC2. PROC2 is in a STOP QUEUE state.

The output for PROC1 while it is executing shows a status of SP in the ST column, which indicates that a thread is executing within a stored procedure:

-DIS THD(\*)

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS - 176
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
BATCH SP 3 RUNAPPL SYSADM PL01AP01 001D 43
V429 CALLING STORED PROCEDURE PROC1, LOAD MODULE LMPROC1
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I - DSNVDT '-DISPLAY THREAD' NORMAL COMPLETION
```

The output for PROC2 while it is queued shows a status of SW in the ST column, which indicates that a thread is waiting for a stored procedure to be scheduled:

## -DISPLAY THREAD (DB2)

-DIS THD(\*)

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS - 198
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
BATCH SW * 13 RUNAPPL SYSADM PL01AP01 001D 43
V429 CALLING STORED PROCEDURE PROC2, LOAD MODULE
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I - DSNVDT '-DISPLAY THREAD' NORMAL COMPLETION
```

**Example 5:** This example shows an allied, nondistributed originating thread (TOKEN=30) that is established (allocated according to plan) in addition to all of its parallel tasks (PT) which are running on the same DB2. All parallel tasks are displayed immediately following their corresponding originating thread.

```
16.32.57 DB1G DISPLAY THREAD(*)
16.32.57 STC00090 DSNV401I DB1G DISPLAY THREAD REPORT FOLLOWS -
16.32.57 STC00090 DSNV402I DB1G ACTIVE THREADS -
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
BATCH T * 1 PUPPYDML USER001 DSNTEP3 0025 30
 PT * 641 PUPPYDML USER001 DSNTEP3 002A 40
 PT * 72 PUPPYDML USER001 DSNTEP3 002A 39
 PT * 549 PUPPYDML USER001 DSNTEP3 002A 38
 PT * 892 PUPPYDML USER001 DSNTEP3 002A 37
 PT * 47 PUPPYDML USER001 DSNTEP3 002A 36
 PT * 612 PUPPYDML USER001 DSNTEP3 002A 35
 PT * 545 PUPPYDML USER001 DSNTEP3 002A 34
 PT * 432 PUPPYDML USER001 DSNTEP3 002A 33
 PT * 443 PUPPYDML USER001 DSNTEP3 002A 32
 PT * 252 PUPPYDML USER001 DSNTEP3 002A 31
DISPLAY ACTIVE REPORT COMPLETE
16.32.58 STC00090 DSN9022I DB1G DSNVDT '-DISPLAY THREAD' NORMAL
COMPLETION
```

**Example 6:** This example shows the detail report for a DB2 client that uses TCP/IP to access a remote DRDA server.

DISPLAY THREAD(\*) LOCATION(\*)

```
DSNV401I - DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS -
NAME ST A REQ ID AUTHID PLAN ASID TOKEN
BATCH TR * 6 BKH2C SYSADM YW1019C 0009 2
V444-STLDRIV.SSLU.A23555366A29=2 ACCESSING DATA AT
V446-USIBMSTODB22:SSURLU
V447--LOCATION SESSID A ST TIME
V448--USIBMSTODB22 4019:446 V R2 9015611253116
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION
```

**Example 7:** This example shows the detail report for a DB2 server that is accessed by a DRDA client using TCP/IP.

DISPLAY THREAD(\*) LOCATION(\*)

DSNV401I - DISPLAY THREAD REPORT FOLLOWS -

DSNV402I - ACTIVE THREADS -

| NAME                                                              | ST | A | REQ | ID    | AUTHID | PLAN     | ASID | TOKEN |
|-------------------------------------------------------------------|----|---|-----|-------|--------|----------|------|-------|
| BATCH                                                             | RA | * | 5   | BKH2C | SYSADM | DISTSERV | 0008 | 2     |
| V445-STLDRIV.SSLU.A23555366A29=2 ACCESSING DATA FOR 123.34.101.98 |    |   |     |       |        |          |      |       |
| V447--LOCATION SESSID A ST TIME                                   |    |   |     |       |        |          |      |       |
| V448--123.34.101.98 446:3171 S2 9015611253108                     |    |   |     |       |        |          |      |       |

DISPLAY ACTIVE REPORT COMPLETE

DSNV9022I - DSNVDT '-DIS THD' NORMAL COMPLETION

---

### -DISPLAY TRACE (DB2)

The DB2 command DISPLAY TRACE displays a list of active traces. For more information about this trace facility, see Section 4 (Volume 1) of *Administration Guide* .

There is an additional option to this command and values for a few options that are not described here. They are intended for service and use under the direction of IBM support personnel. For details, see *Diagnosis Guide and Reference*.

**Abbreviation:** -DIS TRACE

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

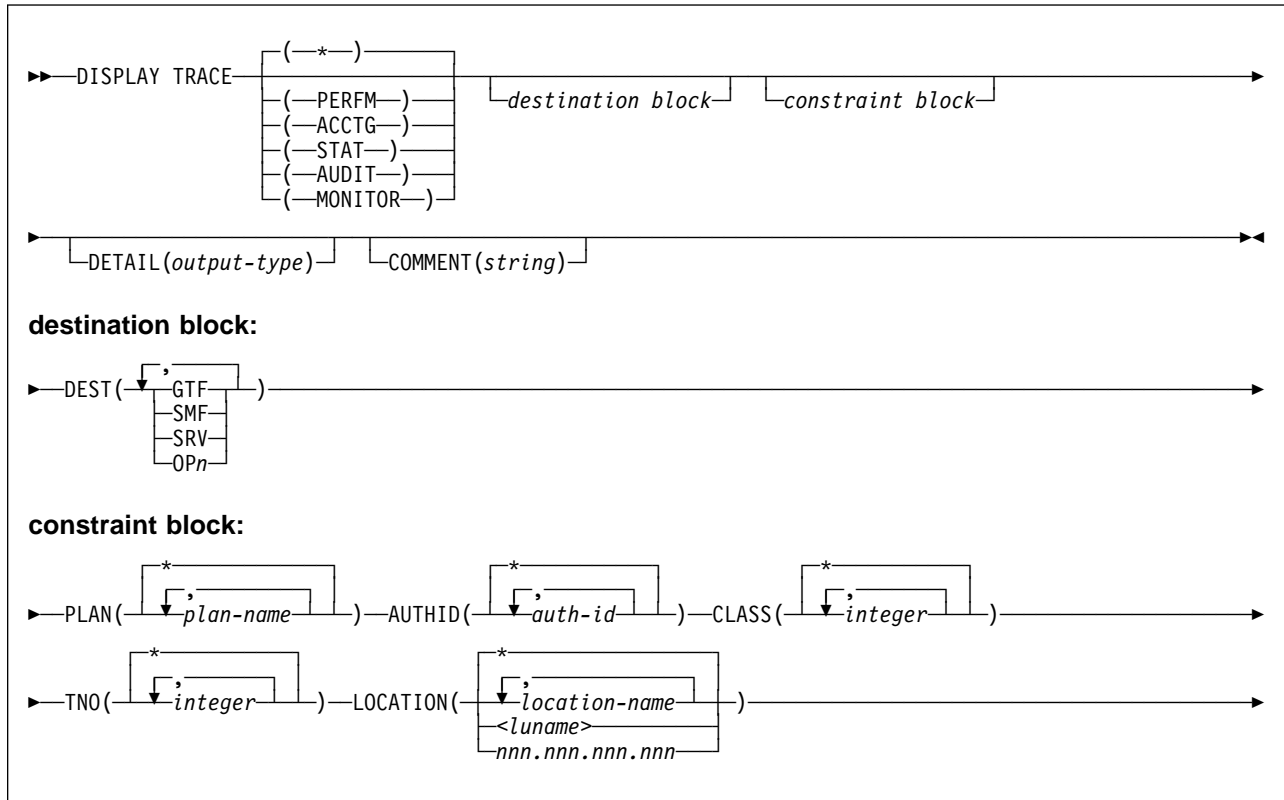
To execute this command, the privilege set of the process must include one of the following:

- DISPLAY privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.



## Syntax



## Option Descriptions

None of the options are required. The command DISPLAY TRACE lists all active traces. Each option that is used, except TNO, limits the effect of the command to active traces that were started using the same option, either explicitly or by default, with exactly the same parameter values. For example, the command

```
-DISPLAY TRACE (PERFM) CLASS (1,2)
```

lists only the active traces that were started using the options PERFM *and* CLASS (1,2); it does *not* list, for example, any trace started using CLASS(1).

(\*) Does not limit the list of traces. The **default** is (\*).

The CLASS option cannot be used with -DISPLAY TRACE (\*).

Each of the following keywords limits the list to traces of the corresponding type. For further descriptions of each type, see “-START TRACE (DB2)” on page 268.

| Type (Abbrev) | Description                             |
|---------------|-----------------------------------------|
| PERFM (P)     | Performance records of specific events  |
| ACCTG (A)     | Accounting records for each transaction |
| STAT (S)      | Statistical data                        |
| AUDIT (AU)    | Audit data                              |
| MONITOR (MON) | Monitor data                            |

## -DISPLAY TRACE (DB2)

### **DETAIL**(*output-type*)

Limits the information that a trace displays based on the output type specified within parentheses.

The possible values for *output-type* are:

- 1 Display summary trace information: TRACE NUMBER, TYPE, CLASS, DEST
- 2 Display qualification trace information: TRACE NUMBER, AUTHID, PLAN, LOCATION
- 1,2 Display both summary and qualification information
- \* Display both summary and qualification information

If no parameter follows DETAIL, type 1 trace information is displayed.

An additional column, QUAL, is also displayed, indicating whether the trace is qualified. Part of the summary trace information, the QUAL column can be used to determine if further qualification information for the trace is available. This information can be obtained by specifying DETAIL (2) or DETAIL (\*). A QUAL column value of YES indicates that additional information for this particular trace exists in the qualification trace information; a value of NO indicates that no additional information for this trace exists.

### **COMMENT**(*string*)

Specifies that comment *string* appears in the trace output, except for the output in the resident trace tables.

*string* is any character string; it must be enclosed between apostrophes if it includes a blank, comma, or special character. The comment does not appear in the display; it can be recorded in trace output, but only if commands are being traced.

### **DEST**

Limits the list to traces started for particular destinations. More than one value can be specified, but do not use the same value twice. If you do not specify a value for DEST, DB2 does not use the destination of where trace output is recorded to limit the list of traces displayed.

#### **Abbreviation:** D

Possible values and their meanings are:

| <b>Value</b> | <b>Trace Destination</b>                                     |
|--------------|--------------------------------------------------------------|
| GTF          | The generalized trace facility                               |
| SMF          | The system management facility                               |
| SRV          | An exit to a user-written routine                            |
| OP <i>n</i>  | A specific destination. <i>n</i> can be a value from 1 to 8. |

See “-START TRACE (DB2)” on page 268 for a list of allowable destinations for each trace type.

### **PLAN**(*plan-name, ...*)

Limits the list to traces started for particular application plans. Up to eight plan names can be used. If more than one name is used, only one value can be used for AUTHID, TNO, and LOCATION. Do not use this option with STAT.

The **default** is **PLAN(\*)**, which does not limit the list.

**AUTHID**(*authorization-id, ...*)

Limits the list to traces started for particular authorization identifiers. Up to eight identifiers can be used. If more than one identifier is used, only one value can be used for PLAN, TNO, and LOCATION. Do not use this option with STAT.

The **default** is **AUTHID(\*)**, which does not limit the list.

**CLASS**(*integer, ...*)

Limits the list to traces started for particular classes. For descriptions of the allowable classes, see “-START TRACE (DB2)” on page 268.

The **default** is **CLASS(\*)**, which does not limit the list.

**TNO**(*integer, ...*)

Limits the list to particular traces, identified by their trace numbers (1 to 32, 01 to 09). Up to eight trace numbers can be used. If more than one number is used, only one value each for PLAN, AUTHID, and LOCATION can be used.

The **default** is **TNO(\*)**, which does not limit the list.

**LOCATION**(*location-name, ...*)

Limits the list to traces started for threads that have a distributed relationship with the specified location.

(*location-name*)

The location names that you supply are the 1 to 16 character identifiers assigned to the DB2 subsystem whose traces you want to display. Supplying an \* as the location name indicates that the trace display must include all traces started with any location name qualifier.

You can specify up to eight location names. If you specify more than one location name, you can only specify one value each for PLAN, AUTHID, and TNO.

LOCATION cannot be specified when you choose a statistics trace.

**Requesters Other Than DB2 for OS/390:** DB2 does not receive a location name from requesters that are not DB2. To display information about a requester that is not a DB2 for OS/390 subsystem, enter its LUNAME, enclosed by the less-than (<) and greater-than (>) symbols. For example, the following command displays information about a remote location with the LUNAME of LULA:

```
-DISPLAY TRACE (*) LOCATION (<LULA>)
```

DB2 uses the < LUNAME> notation in messages displaying information about requesters that are not DB2 for OS/390.

The **default** is **LOCATION(\*)**, which does not limit the list.

<*luname*>

Activates the DB2 trace for the remote clients that are connected to DDF through the remote SNA LU that you specified in *luname*.

*nnn.nnn.nnn.nnn*

Activates the DB2 trace for the remote clients that are connected to DDF through the remote TCP/IP host whose IP address is specified by *nnn.nnn.nnn.nnn*.

## -DISPLAY TRACE (DB2)

### Examples

**Example 1:** List all traces that have the generalized trace facility as their only destination.

```
-DISPLAY TRACE (*) DEST (GTF)
```

**Example 2:** List the trace started for Example 2 of -START TRACE.

```
-DISPLAY TRACE (ACCTG) PLAN (DSN8BC51)
 COMMENT ('ACCTG TRACE FOR DSN8BC51')
```

**Example 3:** List all active performance traces.

```
-DISPLAY TRACE=P
```

**Example 4:** List all active audit traces for threads that are connected to the DB2 subsystem with location name USIBMSTODB23.

```
-DISPLAY TRACE (AUDIT) LOCATION (USIBMSTODB23)
```

**Example 5:** Output from -DISPLAY TRACE is a set of messages that look like this:

```
- 10.26.34 -DISPLAY TRACE
- 10.26.34 STC 21 DSNW127I - CURRENT TRACE ACTIVITY IS -
- TNO TYPE CLASS DEST QUAL
- 01 STAT 01 SMF NO
- 02 ACCTG 01 SMF YES
- 03 PERFM 01,02,03 GTF YES
- 04 AUDIT 01,02,03,04, SMF YES
- 04 06,07
- 05 MON 01,02,03 OP1 NO
- *****END OF DISPLAY TRACE SUMMARY DATA*****
- 10.26.34 STC 21 DSN9022I - DSNWVCM1 '-DISPLAY TRACE' NORMAL COMPLETION

- 10.28.47 -DISPLAY TRACE DETAIL(*)
- 10.28.47 STC 21 DSNW127I - CURRENT TRACE ACTIVITY IS -
- TNO TYPE CLASS DEST QUAL
- 01 STAT 01 SMF NO
- 02 ACCTG 01 SMF YES
- 03 PERFM 01,02,03 GTF YES
- 04 AUDIT 01,02,03,04, SMF YES
- 04 06,07
- 05 MON 01,02,03 OP1 NO
- *****END OF DISPLAY TRACE SUMMARY DATA*****
- 10.28.47 STC 21 DSNW143I - CURRENT TRACE QUALIFICATIONS ARE -
- TNO AUTHID PLAN RMID LOCATION
- 01 * * * *
- 02 * * * *
- 03 USER01 * * *
- 04 * * 14,16,18,26 DENVER
- 05 * PROG1 * *
- 06 * * * *
- *****END OF DISPLAY TRACE QUALIFICATION DATA*****
- 10.28.47 STC 21 DSN9022I - DSNWVCM1 '-DISPLAY TRACE' NORMAL COMPLETION
```

## -DISPLAY UTILITY (DB2)

The DB2 command DISPLAY UTILITY displays the status of utility jobs, including utility jobs in a data sharing group.

The output from the command consists of informational messages only. One set of messages is returned for each job identified by the command. For utility jobs in a data sharing group, the output shows the member name of the system on which each utility job is running.

The status from the display represents the current status, except in a data sharing group when the utility is running on a member other than the one from which the command is issued. In that case, the status is current as of the last checkpoint.

**Abbreviation:** -DIS UTIL

## Environment

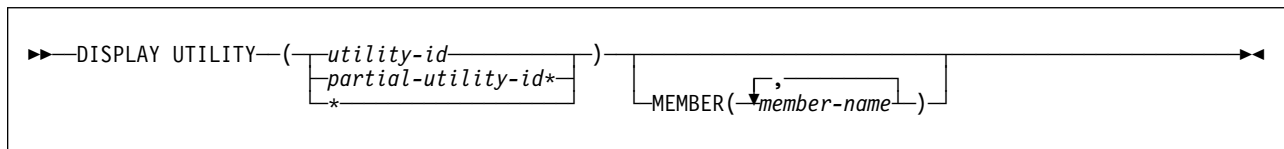
This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group or member, depending on which option you choose

## Authorization

None is required.

## Syntax



## Option Descriptions

Use at least one of the following options but do not use the same one more than once.

### (utility-id)

Identifies a single job by its utility identifier, the value given for the UID parameter when the job was created.

If *utility-id* was created by the DSNU CLIST by default, it has the form of *tso-userid.control-file-name*. For a list of values for *control-file-name*, see the description of the UID parameter for the DSNU command procedure (CLIST) in *Utility Guide and Reference*.

If *utility-id* was omitted, *utility-id* has the form *userid.jobname*.

### (partial-utility-id\*)

Identifies a set of utility jobs. A status message is shown for each utility identifier that begins with the characters of *partial-utility-id*.

## -DISPLAY UTILITY (DB2)

For example, -DISPLAY UTILITY(ABCD\*) shows the status of every utility job known to DB2 whose identifier begins with the characters ABCD.

(\*) Shows the status of all utility jobs known to DB2, including jobs currently running in a data sharing group.

### **MEMBER** (*member-name, ...*)

Restricts the display for the identified utility jobs to specific members of the data sharing group. The default is to display utility jobs running on any member. In a non-data-sharing environment, the option is ignored.

One set of messages is returned for each job identified by the command.

## Usage Notes

**DISPLAY Status:** The status displayed in the returned message is the status at the time the DB2 utility function received the command. Execution has proceeded, therefore the current state of the utility can be different from the state reported. For instance, the DISPLAY UTILITY command can indicate a particular utility identifier is active, but, when the message is received by the requester, the utility job step could have terminated so that the utility identifier is no longer known to DB2.

**Command Response:** In a data sharing environment, messages DSNU100I, DSNU105I, DSNU106I show the name of the member on which the utility job is running. If you specify a single member name in the MEMBER option and that member does not belong to the group, or if you specify a list of member names in the MEMBER option and none of those members belong to the group, the command fails and a message is issued.

## Output

The output from -DISPLAY UTILITY consists of informational messages only.

**Output During Any Phase of REORG with SHRLEVEL CHANGE or SHRLEVEL REFERENCE:** During *any* phase of REORG with SHRLEVEL CHANGE or SHRLEVEL REFERENCE, the output of -DISPLAY UTILITY includes the information in DSNU347I. During *any* phase of REORG with SHRLEVEL CHANGE, the output of -DISPLAY UTILITY includes the information in DSNU384I as follows as shown in Example 4 on page 162:

|          |                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------|
| DEADLINE | Indicates a timestamp according to the most recently specified value of DEADLINE.                    |
| MAXRO    | Indicates the number of seconds, according to the most recently specified value of MAXRO.            |
| LONGLOG  | Indicates either CONTINUE, TERM, or DRAIN according to the most recently specified value of LONGLOG. |
| DELAY    | Indicates the number of seconds according to the most recently specified value of DELAY.             |

**Output During LOG phase of REORG with SHRLEVEL CHANGE:** During the LOG phase of REORG with SHRLEVEL CHANGE, the output of -DISPLAY UTILITY now includes the additional information found in message DSNU383I as shown in Example 4 on page 162 as follows:

CURRENT ITERATION NUMBER

Indicates the current iteration number.

WRITE ACCESS ALLOWED IN CURRENT ITERATION

Indicates "YES" or "NO" according to whether write access is allowed in the current iteration of log processing.

ITERATION BEFORE PREVIOUS ITERATION

Indicates the ELAPSED TIME so far, and the NUMBER OF LOG RECORDS PROCESSED in the iteration. Their values are 0 if the current iteration number is 1 or 2.

PREVIOUS ITERATION

Indicates the ELAPSED TIME and the NUMBER OF LOG RECORDS PROCESSED for the previous iteration. Their values are 0 if the current iteration number is 1.

CURRENT ITERATION:

Indicates the ESTIMATED ELAPSED TIME, the ACTUAL ELAPSED TIME SO FAR and the ACTUAL NUMBER OF LOG RECORDS BEING PROCESSED.

CURRENT ESTIMATE FOR NEXT ITERATION

For the next iteration, indicates the currently ELAPSED TIME and the currently estimated NUMBER OF LOG RECORDS TO BE PROCESSED.

**Progress of Utility Processing:** The DISPLAY UTILITY command provides the user an estimate of how much processing the utility has completed. The output displays information from message DSNU105I as seen in Example 2 on page 161 and includes:

COUNT

COUNT *n* is the number of pages or records processed in a utility phase. COUNT has different meanings for different utilities. For utilities not mentioned below, ignore this field.

- For CHECK INDEX, LOAD, RECOVER INDEX and REORG, COUNT represents the number of records processed.
- For COPY, MERGE COPY, RECOVER (restore phase), and RUNSTATS, COUNT represents the number of pages processed.
- For STOSPACE, COUNT represents the number of table spaces or indexes processed.

For more information, see *Utility Guide and Reference*.

## Examples

**Example 1:** Display status information for all utility jobs currently known to DB2.

```
-DISPLAY UTILITY (*)
```

**Example 2:** Display the status of utilities on all members of the data sharing group.

```
-DB1G DISPLAY UTILITY (*)
```

The following output, which shows utility jobs on members DB1G and DB2G, is generated:

## -DISPLAY UTILITY (DB2)

```
DSNU100I -DB1G DSNUGDIS USER = SAMPID
 MEMBER = DB1G
 UTILID = RUNTS
 PROCESSING UTILITY STATEMENT 1
 UTILITY = RUNSTATS
 PHASE = RUNSTATS COUNT = 0
 STATUS = STOPPED
DSNU100I -DB1G DSNUGDIS USER = SAMPID
 MEMBER = DB2G
 UTILID = CHKIX1
 PROCESSING UTILITY STATEMENT 8
 UTILITY = CHECK
 PHASE = UNLOAD COUNT = 0
 STATUS = STOPPED
DSN9022I -DB1G DSNUGCC '-DB1G DISPLAY UTILITY' NORMAL COMPLETION
```

**Example 3:** In a data sharing environment, display the status of utilities on member DB1G.

```
-DB1G DISPLAY UTILITY (*) MEMBER (DB1G)
```

**Example 4:** This shows output from the command DISPLAY UTILITY:

```
-DB1G DISPLAY UTILITY(*)
DSNU105I -DB1G DSNUGDIS - USERID = SYSADM 973
 MEMBER =
 UTILID = REORGCP
 PROCESSING UTILITY STATEMENT 1
 UTILITY = REORG
 PHASE = LOG COUNT = 0
 STATUS = ACTIVE
DSNU347I -DB1G DSNUGDIS - 974
 DEADLINE = NONE
DSNU384I -DB1G DSNUGDIS - 975
 MAXRO = DEFER
 LONGLOG = CONTINUE
 DELAY = 1200 SECONDS
DSNU383I -DB1G DSNUGDIS - CURRENT ITERATION NUMBER = 4 976
WRITE ACCESS ALLOWED IN THIS ITERATION = YES
ITERATION BEFORE PREVIOUS ITERATION:
 ELAPSED TIME = 00:00:00
 NUMBER OF LOG RECORDS PROCESSED = 0
PREVIOUS ITERATION:
 ELAPSED TIME = 00:00:00
 NUMBER OF LOG RECORDS PROCESSED = 0
CURRENT ITERATION:
 ESTIMATED ELAPSED TIME = 00:00:00
 ACTUAL ELAPSED TIME SO FAR = 00:00:00
 ACTUAL NUMBER OF LOG RECORDS BEING PROCESSED = 0
CURRENT ESTIMATE FOR NEXT ITERATION:
 ELAPSED TIME = 00:00:00
 NUMBER OF LOG RECORDS TO BE PROCESSED = 0
DSN9022I -DB1G DSNUGCC '-DIS UTIL' NORMAL COMPLETION
```



## DSN (TSO)

The TSO command DSN enables you to issue DSN subcommands, namely:

|       |        |        |       |
|-------|--------|--------|-------|
| ABEND | BIND   | DCLGEN | END   |
| FREE  | REBIND | RUN    | SPUFI |

During a DSN session, you can enter DB2 commands or comments. DB2 commands must start with a hyphen (-). Comments must start with an asterisk (\*).

During a DSN session, you can also issue TSO commands, except for FREE, RUN, TEST, and TIME. To use TSO TEST to debug an application program, execute it with the DSN command; for example:

```
TEST 'prefix.SDSNLOAD(DSN)' CP
```

The ABEND subcommand listed above is used for diagnostic purposes only, and is intended to be used only under the direction of your IBM Support Center. Use it only when diagnosing a problem with DSN or DB2. Percent commands are not recognized during a DSN session, they are only supported by the TSO command processor.

## Environment

A DSN session runs under TSO in either foreground or background mode. When you run it in background mode, you are not prompted for corrections or additional required information.

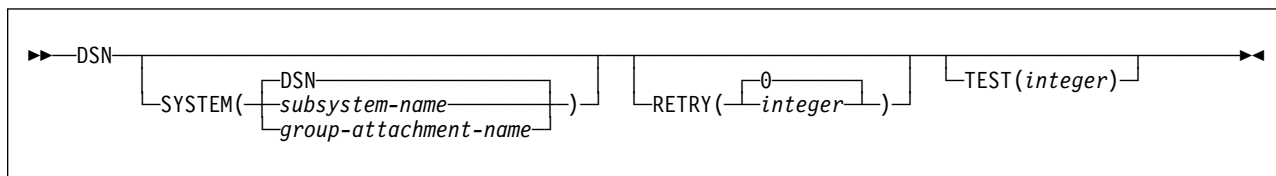
You can also start a DSN session from a CLIST running in either foreground or background mode.

**Data Sharing Scope:** Member

## Authorization

None is required for the DSN command, but authorization is required for most subcommands.

## Syntax



## Option Descriptions

None of the following options are required.

### SYSTEM

(*subsystem-name*)

Specifies the name of the DB2 subsystem.

*(group-attachment-name)*

Specifies the group attachment name of the data sharing group.

If you do not supply a subsystem name or group attachment name, the **default** is **SYSTEM(DSN)**. This value can be modified during DB2 installation.

**RETRY**(*integer*)

*integer* specifies the number of additional times connection to the DB2 subsystem should be attempted if DB2 is not up or the maximum number of batch connections has been reached when DSN is issued. Retries occur at 30-second intervals.

The **default** is **RETRY(0)**. The maximum number of retries is 120.

**TEST**(*integer*)

*integer* specifies the last two digits of the module name in order to trace a single DSN module. Specify a number greater than 100 to trace all DSN modules. DSN trace information messages are written to the TSO SYSTSPRT DD statement, and optionally, to the DSNTRACE DD statement.

## Usage Notes

**Beginning a DSN Session:** Issue the DSN command to begin a DSN session, which allows you to enter DSN subcommands. These rules govern the session:

- In foreground operation, you are prompted for input by the prompt string DSN at the terminal. In background mode, your input is read from the SYSTSIN data set.
- Except for delimited table names in the DCLGEN command, input in lowercase letters is changed to uppercase.
- If duplicate keywords of any subcommand are specified, only the last of these keywords is processed. For example, if both MEMBER(*dbrm-member-name1*) and MEMBER(*dbrm-member-name2*) are specified with BIND PLAN, DB2 receives only the latter, MEMBER(*dbrm-member-name2*).
- If ATTENTION (PA1) is pressed during a DSN session, and PROMPT is specified in the TSO user profile, message DSNE005 appears: EXECUTION IS INTERRUPTED, ENTER C TO CANCEL, OR ANY OTHER REPLY TO RESUME THE *subcommand* SUBCOMMAND.

If you enter C, the current subcommand is canceled and the current DB2 connection terminates; a new one is established, and another DSN prompt appears. Any other reply, except ATTENTION, causes the current subcommand to continue from the point at which it was interrupted.

If a DSN session is started from a CLIST, or a CLIST is executed under DSN, CONTROL PROMPT must be specified in the CLIST in order to receive message DSNE005.

- After a command is processed during a DSN session, you are prompted for input. That cycle continues until you end the session.
- You can end the session by doing one of the following:
  - Issue the END subcommand. Control is passed to TSO.
  - Press ATTENTION and respond to the message by pressing ATTENTION again.

- Issue another DSN command. The old session ends and a new one begins.

**DSN Return Code Processing:** At the end of a DSN session, register 15 contains the highest value placed there by any DSN subcommand used in the session or by any program run by the RUN subcommand. Your run-time environment might format that value as a return code. The value does not, however, originate in DSN.

## Examples

**Example 1:** Start a DSN session. If the attempt to connect to DB2 fails, five retries (at 30 second intervals) are to be made.

```
DSN SYSTEM (DB2) RETRY (5)
```

**Example 2:** Start a DSN session, run a program, and then end the session and return to TSO.

```
TSO prompt : READY
USER enters: DSN SYS (SSTR)
DSN prompt : DSN
USER enters: RUN PROGRAM (MYPROG)
DSN prompt : DSN
USER enters: END
TSO prompt : READY
```

---

### DSNC (CICS Attachment Facility)

The CICS attachment facility DSNC command allows you to enter DB2 commands from CICS.

#### Environment

This command can be issued only from a CICS terminal.

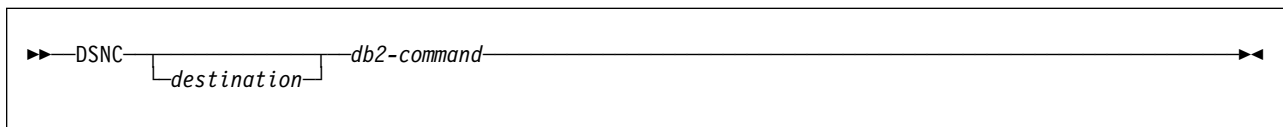
**Data Sharing Scope:** Member

#### Authorization

This command requires the appropriate level of CICS authority, as described in the appropriate *CICS/ESA CICS - RACF Security Guide* or *CICS/MVS Operations Guide*.

Entering the DSNC command requires no privileges from DB2 security. For a description of the privileges required to issue a DB2 command using the DSNC command, see the command's description.

#### Syntax



#### Option Descriptions

*destination*

Identifies another terminal to receive display information. It must be a valid terminal that is defined to CICS and supported by CICS basic mapping support (BMS).

*db2-command*

Specifies the exact DB2 command that you want to enter from a CICS terminal. It must be preceded by a hyphen.

#### Usage Note

**Screen Scrolling:** The CICS SIT table keyword SKRxxxx can be used to support the scrolling of DSNC DB2 commands from your terminal. For further information regarding the SIT keywords and parameters, see *CICS/ESA System Definition Guide*.

#### Example

**Example:** Issue the DB2 command -DISPLAY THREAD from a CICS terminal.

```
DSNC -DISPLAY THREAD
```

## DSNC DISCONNECT (CICS Attachment Facility)

The CICS attachment facility command DSNC DISCONNECT disconnects threads.

The command provides manual control to release resources being shared by normal transactions so that special purpose processes, such as utilities, can have exclusive access to the resources.

**Abbreviation:** DSNC DISC

### Environment

This command can be issued only from a CICS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of CICS authority, as described in the appropriate *CICS/ESA CICS - RACF Security Guide*.

### Syntax

```
▶▶—DSNC DISCONNECT—plan-name————▶▶
```

### Parameter Description

*plan-name*

Specifies a valid application plan.

### Usage Notes

**Preventing Creation of Threads:** The command DSNC DISCONNECT does not prevent threads from being created on behalf of transactions. The command only causes currently connected threads to be terminated as soon as they are not being used by a transaction. To interrupt a transaction and cancel a thread faster, you can use the command CANCEL THREAD. For details, see “-CANCEL THREAD (DB2)” on page 81.

You can stop the transactions associated with a particular plan ID in CICS with the MAXIMUM setting for TCLASS or MAXACTIVE setting for TRANCLASS. This prevents new instances of the transaction from causing a re-creation of a thread.

**Alternative for Protected Threads:** You may want to deallocate a plan for rebinding or for running a utility against the database. If you are using a protected thread, use DSNC MODIFY rather than DSNC DISCONNECT. Modify the THRDA value of the plan to zero to send all the threads to the pool. The protected thread will terminate on its own within 60 seconds and DISCONNECT is unnecessary.

## DSNC DISCONNECT (CICS)

### Example

*Example:* Disconnect active threads for PLAN1.

```
DSNC DISC PLAN1
```

## DSNC DISPLAY (CICS Attachment Facility)

The CICS attachment facility command DSNC DISPLAY displays information on CICS transactions accessing DB2 data, or statistical information associated with entries in the resource control table (RCT).

**Abbreviation:** DSNC DISP

### Environment

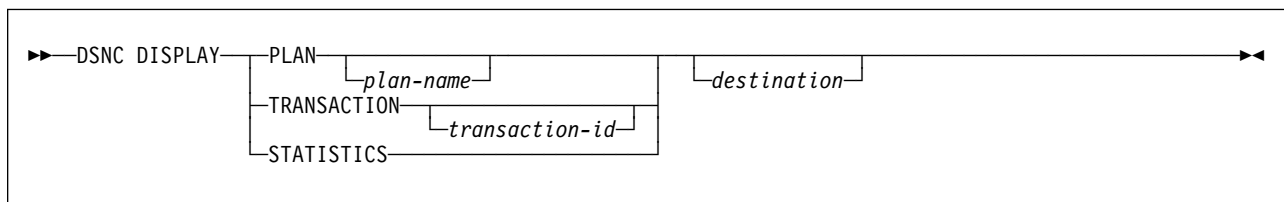
This command can be issued only from a CICS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of CICS authority, as described in the *CICS/ESA CICS - RACF Security Guide* or *CICS/MVS Operations Guide*.

### Syntax



### Option Descriptions

#### **PLAN** *plan-name*

Displays information about transactions by plan name.

*plan-name* is a valid plan name for which information is displayed.

**Default:** If you do not specify *plan-name* (or if you specify an asterisk, \*), information is displayed for all active plan names listed in the resource control table.

#### **TRANSACTION** *transaction-id*

Displays information about transactions by transaction ID.

**Abbreviation:** TRAN

*transaction-id* is a valid transaction ID for which information is displayed. For a group transaction entry in the resource control table, you can enter an identifier for any transaction associated with the group.

**Default:** If you do not specify a transaction ID, information is displayed for all active transactions listed in the resource control table.

#### **STATISTICS**

Displays the statistical counters associated with each entry in the resource control table. The counters concern the usage of the available connections of the CICS attachment facility to DB2.

**Abbreviation:** STAT

## DSNC DISPLAY (CICS)

If you issue this command from CICS while the CICS attachment facility is active but the DB2 subsystem is not, a statistics display is produced with no obvious indication that the subsystem is not operational. Message DSNC037A appears in the CICS message log to indicate that the attachment facility is waiting for DB2 to start.

For a description of the output produced by this parameter, see Section 4 (Volume 1) of *Administration Guide*.

### *destination*

Is the identifier of another terminal to receive the requested display information. It must be a valid terminal that is defined to CICS and supported by CICS basic mapping support (BMS).

## Usage Notes

**Entering Parameters:** Because the optional destination is sometimes preceded by an optional plan name or transaction ID in the command, each parameter must be unique and separately identifiable as either a name or a terminal identifier. If only one parameter is entered, it is first checked to see whether it is a plan name or a transaction ID, and it is then checked as a destination. To use a character string that is both a plan name or transaction ID and also a valid terminal identifier, you must use both the name and destination parameters to display the desired information at the desired terminal.

**Acknowledging Display Information Sent to an Alternate Destination:** When an alternate destination is specified to receive the requested display information, the following message is sent to the requesting terminal:

```
DSNC020I THE DISPLAY COMMAND IS COMPLETE
```

## Output

The following is an example of the output for the DSNC DISPLAY (PLAN or TRANSACTION) command. For each created thread, the output shows the plan or transaction name. An 'A' in field A/I indicates that the thread is within a unit of work. An 'I' indicates that the thread is waiting for a unit of work authorization ID for the plan being used.

```
DSNC013I DISPLAY REPORT FOLLOWS
 NAME A/I AUTH-ID
XP05 A SYSADM
DSNC020I THE DISPLAY COMMAND IS COMPLETE
```

For each entry in the RCT, the output of a DSNC DISPLAY STATISTICS command as seen in Example 4 on page 172 displays the following information:

|      |                                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRAN | Transaction name. For group entries, this is the name of the first transaction defined in the group. DSNC shows the statistics for the TYPE=COMD RCT entry. POOL shows statistics for the TYPE=POOL entry, unless the TYPE=POOL entry contains the parameter TXID=x. |
| PLAN | The plan name associated with this entry. Eight asterisks in this field indicates that this transaction is using dynamic plan allocation. The command processor transaction DSNC does not have a plan associated with it because it uses a command processor.        |



|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CALLS    | The total number of SQL statements issued by transactions associated with this entry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| AUTHS    | The total number of sign-on invocations for transactions associated with this entry. A sign-on does not indicate whether a new thread is created or an existing thread is reused. If the thread is reused, a sign-on occurs only if the authorization ID or transaction ID has changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| W/P      | <p>The number of times that all available threads for this entry were busy. This value depends on the value of TWAIT for the entry.</p> <p>If TWAIT was set to POOL in the RCT, W/P indicates the number of times the transaction overflowed to the pool. An overflow to the pool shows up in the transaction statistics only and is not reflected in the pool statistics.</p> <p>If TWAIT was set to YES, this reflects the number of times that the thread both had to wait, and could not attach a new subtask (number of started tasks has reached THRDA).</p> <p>The only time W/P is updated for the pool is when a transaction had to wait for a pool thread and a new subtask could not be attached for the pool. The W/P statistic is useful for determining if there are enough threads defined for the entry.</p> |
| HIGH     | The maximum number of threads required by transactions associated with this entry at any time since the connection was started. This number includes the transactions that were forced to wait or diverted to the pool. It provides a basis for setting the maximum number of threads for the entry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ABORTS   | The total number of units of recovery which were rolled back. It includes both abends and SYNCPOINT ROLLBACKS, including SYNCPOINT ROLLBACKS generated by -911 SQL codes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| COMMITTS | One of the following two fields is incremented each time a DB2 transaction associated with this entry has a real or implied (such as EOT) syncpoint. Units of recovery that do not process SQL calls are not reflected here.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1-PHASE  | The total number of single phase commits for transactions associated with this entry. This total does not include any 2-phase commits (see the explanation for 2-PHASE below). This total does include read-only commits as well as single phase commits for units of recovery which have performed updates. A 2-phase commit is needed only when CICS is the recovery coordinator for more than one resource manager.                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2-PHASE  | The total number of 2-phase commits for transactions associated with this entry. This number does not include 1-phase commit transactions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Examples

**Example 1:** Display information on all active plan IDs listed in the resource control table. The display information is to be sent to another terminal designated as MTO2.

```
DSNC DISP PLAN * MTO2
```

**Example 2:** Display information about all active transactions listed in the resource control table.

```
DSNC DISP TRANSACTION
```

**Example 3:** Display statistical counters associated with each entry in the resource control table.

```
DSNC DISP STAT
```

**Example 4:** This is an example of the output for the DSNC DISPLAY STATISTICS command:

```
DSNC014I STATISTICS REPORT FOR 'DSNCRCTC' FOLLOWS
```

|      |         |       |       |     |      |        | -----COMMITTS----- |         |
|------|---------|-------|-------|-----|------|--------|--------------------|---------|
| TRAN | PLAN    | CALLS | AUTHS | W/P | HIGH | ABORTS | 1-PHASE            | 2-PHASE |
| DSNC |         | 1     | 1     | 1   | 1    | 0      | 0                  | 0       |
| POOL | POOL    | 0     | 0     | 0   | 0    | 0      | 0                  | 0       |
| XC01 | DSNXC01 | 22    | 1     | 11  | 2    | 0      | 7                  | 5       |
| XC02 | DSNXC02 | 0     | 0     | 0   | 0    | 0      | 0                  | 0       |
| XA81 | DSNA81  | 0     | 0     | 0   | 0    | 0      | 0                  | 0       |
| XCD4 | DSNCED4 | 0     | 0     | 0   | 0    | 0      | 0                  | 0       |
| XP03 | DSNTP03 | 1     | 1     | 0   | 1    | 0      | 1                  | 0       |
| XA20 | DSNTA20 | 1     | 1     | 0   | 1    | 0      | 0                  | 1       |
| XA88 | *****   | 0     | 0     | 0   | 0    | 0      | 0                  | 0       |

```
DSNC020I THE DISPLAY COMMAND IS COMPLETE
```

## DSNC MODIFY (CICS Attachment Facility)

The CICS attachment facility command DSNC MODIFY modifies the ERRDEST entry in the resource control table (RCT), or the maximum active thread value associated with a given transaction or group name.

**Abbreviation:** DSNC MODI

### Environment

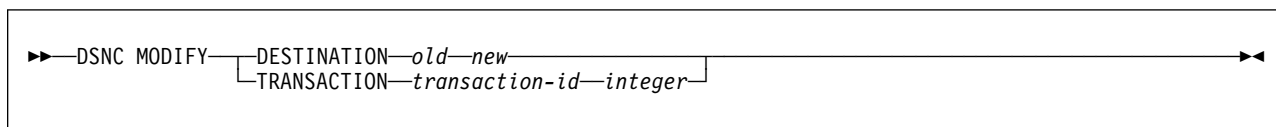
This command can be issued only from a CICS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of CICS authority, as described in the appropriate *CICS/ESA CICS - RACF Security Guide* or *CICS/MVS Operations Guide*.

### Syntax



### Option Descriptions

#### DESTINATION

Specifies that the ERRDEST parameter of the resource control table is to be changed, replacing the “old” destination ID with the “new” destination ID.

**Abbreviation:** DEST

*old*

Is any destination ID currently active in the ERRDEST of the resource control table.

*new*

Is a new destination identifier. The new destination is verified to ensure that it is an existing transient data entry in the destination control table.

#### TRANSACTION

Specifies that the maximum active thread value associated with the given transaction or group is to be modified.

**Abbreviation:** TRAN

*transaction-id*

Is a valid transaction identifier. If the change is for a group transaction entry in the RCT, any transaction ID associated with the group can be entered to identify the entry.

*integer*

Is a new maximum value.

### Usage Notes

**Protected Threads:** If you increase the active thread value using the command DSNC MODIFY TRANSACTION, the attributes of the TYPE=ENTRY macro are used. If the TYPE=ENTRY definition does not include a setting for an attribute, then the TYPE=INIT value is used.

Issuing DSNC MODIFY TRANSACTION to increase the total threads permitted allows creation of unprotected threads. For example, assume THRDS=2, THRDA=2 and THRDM=6. If the total number of threads permitted is increased, the additional threads are unprotected.

The command DSNC MODIFY TRANSACTION can also allow creation of protected threads. If THRDS=2, THRDA=2 and THRDM=6 and the value of THRDA is modified to 1, one of the protected threads is eliminated. If the value of THRDA is then modified back to 2, the thread that is re-created is protected.

**TRANSACTION Thread Limit:** The *integer* specified in the command DSNC MODIFY TRANSACTION cannot be larger than the value specified for the THRDM parameter of the DSNCRCT TYPE=ENTRY macro. The lowest possible value is zero. The value specified for the THRDM parameter is an upper limit (provided during initialization) on the number of threads to be connected for a transaction group. For more information about defining the thread limit, see Section 2 of *Installation Guide*.

### Example

**Example:** Change the specification of the ERRDEST parameter in the resource control table from MTO1 to MTO2.

```
DSNC MODI DEST MT01 MT02
```

## DSNC STOP (CICS attachment facility)

The CICS Attachment Facility command DSNC STOP stops the attachment facility.

### Environment

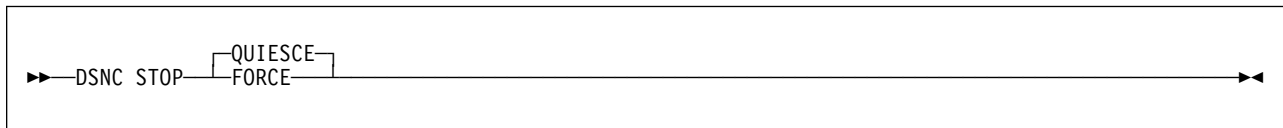
This command can be issued only from a CICS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of CICS authority, as described in the appropriate *CICS/ESA CICS - RACF Security Guide* or *CICS/MVS Operations Guide*.

### Syntax



### Option Descriptions

#### QUIESCE

Specifies that the CICS attachment facility is to be stopped after CICS transactions currently running terminate.

**Abbreviation:** Q

The **default** is QUIESCE.

#### **FORCE**

Specifies that the CICS attachment facility is to be stopped immediately by forcing disconnection with DB2, regardless of any transactions that are running.

### Usage Notes

**Restarting Requirements:** Using FORCE can leave threads in an indoubt situation. Restarting requires reconnection of CICS and DB2 to resolve any indoubt situations. In a data sharing environment, resolution of indoubt situations requires that the CICS be reconnected to the same DB2 member.

**Output Destinations:** Output from the command DSNC STOP is sent to both the requesting terminal, and to the transient data queue for error messages defined in the DSNCRCT TYPE=INITIAL macro.

### Example

**Example:** Stop the CICS attachment facility.

```
DSNC STOP FORCE
```

---

### DSNC STRT (CICS attachment facility)

The DSNC STRT command starts the CICS attachment facility, which allows CICS application programs to access DB2 databases.

CICS Version 4 provides a new attachment facility that is shipped on the CICS product tape. For CICS Version 3 and prior releases, DB2 continues to provide facilities that attach to CICS services, just like prior DB2 releases did.

### Environment

This command can be issued only from a CICS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of CICS authority, as described in the appropriate *CICS/ESA CICS - RACF Security Guide* or *CICS/MVS Operations Guide*.

The syntax of the command DSNC STRT depends on which version of CICS you are using.

### Syntax



### Parameter Description

#### CICS Version 4 or Subsequent Releases

##### *rct-suffix*

Specifies the resource control table to be loaded when the CICS attachment facility starts. The *rct-suffix*, which can be one or two bytes, is appended to DSN2CT to create the name of the resource control table. (For example, if you specify 33 as the *rct-suffix*, module DSN2CT33 is loaded.)

The **default** is the suffix specified in the CICS INITPARM parameter, a feature of the new CICS attachment facility. If a suffix was not specified in INITPARM, the default is 00, and module DSN2CT00 is loaded.

##### *ssid*

Specifies the subsystem ID (SSID) field of the resource control table, which allows the attachment facility to connect to any DB2 subsystem using just

one resource control table. No blanks are allowed between the suffix and the SSID.

The **default** is the SSID specified in the CICS INITPARM parameter. If an SSID was not specified in INITPARM, the default is the SSID specified in the resource control table.

### CICS Version 3 or Prior Releases

#### *suffix-character*

Specifies the resource control table to be loaded when the CICS attachment facility starts. The one-byte *suffix-character* is appended to DSNCRCT to create the name of the resource control table. (For example, if you specify 1 as the *suffix-character*, module DSNCRCT1 is loaded.)

The **default** is 0, and module DSNCRCT0 is loaded.

## Usage Note

**Output Destinations:** Output from the DSNC START command is sent to both the requesting terminal, and to the transient data queue for error messages defined in the DSNCRCT TYPE=INIT macro.

## Examples

**Example 1:** Assume you have CICS Version 3 Release 3. Start the CICS attachment facility, using DSNCRCTA.

```
DSNC STRT A
```

**Example 2:** Start the CICS Version 4 Release 1 attachment facility. Use DSN2CT33 to connect to SSID DB2P.

```
DSNC STRT 33,DB2P
```

**Example 3:** Start the CICS Version 4 Release 1 attachment facility. Use the default resource control table with SSID DBA1.

```
DSNC STRT ,DBA1
```

**Example 4:** Start the CICS Version 4 Release 1 attachment facility. Use DSN2CTA to connect to the SSID that is specified in DSN2CTA.

```
DSNC STRT A
```

---

## DSNH (TSO CLIST)

The DSNH command procedure (a TSO CLIST) is a powerful yet easy method of preparing an application program for execution. By issuing a single command, you can select numerous options required for the preparation of an application and execute it under TSO.

DSNH processing is a sequential process that can include any of the following actions referred to by the two-letter step name:

| <b>For invoking the...</b>                                         | <b>Step name</b> |
|--------------------------------------------------------------------|------------------|
| PL/I macro processor                                               | MP               |
| DB2 precompiler                                                    | PC               |
| CICS command language translator                                   | TR               |
| DSN BIND PLAN subcommand for binding a plan                        | BI               |
| DSN BIND PACKAGE subcommand for binding a package                  | BP               |
| Compiler or assembler for your program                             | CO               |
| A C compiler prelink utility for including compile-time parameters | PL               |
| Link-editor to produce an executable load module                   | LE               |
| DSN RUN subcommand to execute the program                          | RU               |

**Note:** The step names are used in the heading of Table 12 on page 180.

Individual steps or a sequence of steps can be performed, and you can end the process at any point you choose. Any steps in the process that are skipped must have been previously completed successfully by DSNH. For guidance in preparing an application program for execution, see *Application Programming and SQL Guide*. See Table 1 on page 25 for a description of the DSN BIND subcommands.

## Environment

The DSNH CLIST can run in TSO foreground or in batch under the TSO terminal monitor program. DB2I uses the DSNH CLIST on the precompiler panel to control program preparation. You can pass DSNH parameters from DB2I panels on the "Other options" lines.

**Data Sharing Scope:** Member

## Authorization

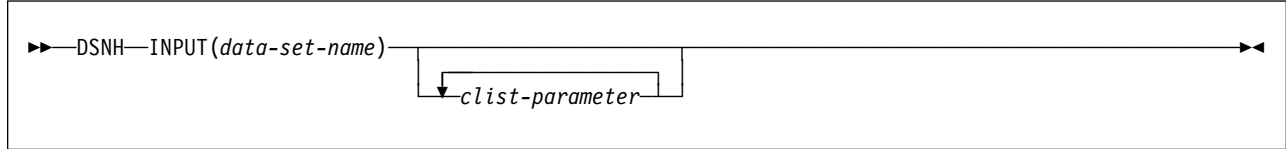
See "BIND PACKAGE (DSN)" on page 46 for a description of the privileges necessary to bind a package.

See "BIND PLAN (DSN)" on page 51 for a description of the privileges necessary to bind a plan.

See "RUN (DSN)" on page 240 for a description of the privileges necessary to run a plan.



## Syntax



## Summary of DSNH CLIST Parameters

The CLIST parameters provide the processing options for each step; specify them when you execute DSNH. Some parameters are used for more than one step, as indicated in Table 12 on page 180. The figure shows where each parameter is used, using the following notation:

- Y in any cell shows that the option listed at the beginning of the row is used in the step whose name appears at the top of the column.
- \* in any cell indicates that the option listed at the beginning of the row is used in *another* step which affects the step whose name appears at the top of the column.

### **Notation of CLIST Parameters for the BIND PLAN and BIND PACKAGE**

**Steps:** Many parameters of BIND PLAN and of BIND PACKAGE provide the same function and are spelled alike. CLIST parameters for BIND PLAN and BIND PACKAGE are differentiated from general parameters and from each other by prefixes. A parameter name prefixed by the letter B applies to the BIND PLAN subcommand; a parameter name prefixed by the letter P applies to BIND PACKAGE.

In Table 12 on page 180, a prefix is separated from the DB2 parameter name by a slash (/). Table 11 shows the variations possible for a single parameter name.

Table 11. DSNH Clist Prefixing Rules

| Parameter value    | Function or subcommand                                                                                       | Example  |
|--------------------|--------------------------------------------------------------------------------------------------------------|----------|
| <i>parameter</i>   | If no prefix is specified, the parameter applies to a single function or subcommand.                         | DBRMLIB  |
| <i>B/parameter</i> | The prefix B is used to indicate that this variation of the parameter applies only to the BIND PLAN step.    | BDBRMLIB |
| <i>P/parameter</i> | The prefix P is used to indicate that this variation of the parameter applies only to the BIND PACKAGE step. | PDBRMLIB |

# DSNH (TSO CLIST)

Table 12 (Page 1 of 2). Summary of DSNH CLIST Parameters

| OPTIONS       | MP | PC | TR | BI | BP | CO | PL | LE | RU |
|---------------|----|----|----|----|----|----|----|----|----|
| ACQUIRE       | -  | -  | -  | Y  | -  | -  | -  | -  | *  |
| P/ACTION      | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| ASMLIB        | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| ASMLOAD       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| P/BDMEM       | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/BIND        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/BLIB        | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| P/BnLIB       | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| P/BMEM        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| CACHESIZE     | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| CCLINK        | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CCLLIB        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| CCLOAD        | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CCMSGSG       | -  | -  | -  | -  | -  | Y  | Y  | -  | -  |
| CCOLIB        | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CCPLIB        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| CCPMSGSG      | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CCSLIB        | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| P/CICS        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| CICSCOB       | -  | -  | Y  | -  | -  | -  | -  | Y  | -  |
| CICSLLIB      | -  | -  | Y  | -  | -  | -  | -  | Y  | -  |
| CICSOPT       | -  | -  | Y  | -  | -  | -  | -  | -  | -  |
| CICSPRE       | -  | -  | Y  | -  | -  | -  | -  | Y  | -  |
| CICSPLIB      | -  | -  | Y  | -  | -  | -  | -  | Y  | -  |
| CICSVBR       | -  | -  | Y  | -  | -  | -  | -  | Y  | -  |
| CICSXLAT      | -  | -  | Y  | -  | -  | -  | -  | -  | -  |
| CLIB          | Y  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CnLIB         | Y  | -  | -  | -  | -  | Y  | -  | -  | -  |
| COBICOMP      | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| COBILINK      | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| COBIPLNK      | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| COBIPMSG      | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| COBLIB        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| COBLOAD       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| COBSOM        | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| COB2CICS      | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| COB2LIB       | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| COB2LOAD      | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| COMPILE       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CONNECT       | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| CONTROL       | Y  | -  | Y  | *  | -  | Y  | -  | Y  | Y  |
| COPTION       | Y  | -  | -  | -  | -  | Y  | -  | -  | -  |
| COPY          | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| COPYVER       | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| CPPCLASS      | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CPPCLINK      | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CPPCLLIB      | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| CPPCSLIB      | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CPPLLIB       | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CPPPMSGSG     | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| CPPSLIB       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CPPUTIL       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| CURRENTDATA   | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| CURRENTSERVER | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| DATE          | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| P/B/DBRMLIB   | -  | Y  | -  | Y  | Y  | -  | -  | -  | -  |
| DECARTH       | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| DECIMAL       | -  | Y  | -  | -  | -  | *  | -  | -  | -  |
| P/DEFER       | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/DEGREE      | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| DELIMIT       | -  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| P/DISABLE     | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| DISCONNECT    | -  | -  | -  | Y  | -  | -  | -  | -  | -  |

Table 12 (Page 1 of 2). Summary of DSNH CLIST Parameters

| OPTIONS        | MP | PC | TR | BI | BP | CO | PL | LE | RU |
|----------------|----|----|----|----|----|----|----|----|----|
| P/DLIBATCH     | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/DYNAMICRULES | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/ENABLE       | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| ENTRY          | -  | -  | -  | -  | -  | -  | -  | -  | Y  |
| EXPLAIN        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/FLAG         | Y  | Y  | Y  | Y  | Y  | Y  | -  | -  | -  |
| FORTLIB        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| FORTLOAD       | -  | -  | -  | -  | -  | Y  | -  | -  | -  |
| GRAPHIC        | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| HOST           | Y  | Y  | Y  | *  | -  | Y  | -  | Y  | Y  |
| P/IMSBMP       | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/IMSMPP       | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| IMSPRE         | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| INPUT          | Y  | Y  | *  | *  | -  | Y  | -  | Y  | Y  |
| P/ISOLATION    | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| P/KEEPDYNAMIC  | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| LINECOUNT      | Y  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| LINK           | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| LLIB           | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| LnLIB          | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| LOAD           | -  | -  | -  | -  | -  | -  | -  | Y  | Y  |
| LOPTION        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| MACRO          | Y  | -  | Y  | -  | -  | -  | -  | -  | -  |
| NOFOR          | Y  | -  | -  | -  | -  | -  | -  | -  | -  |
| P/NODEFER      | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| OPTIONS        | -  | Y  | Y  | -  | -  | -  | -  | Y  | Y  |
| OUTNAME        | Y  | Y  | -  | -  | -  | Y  | -  | Y  | Y  |
| P/OWNER        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| PACKAGE        | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| PARMS          | -  | -  | -  | -  | -  | -  | -  | -  | Y  |
| PASS           | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| PCLOAD         | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| PKLIST         | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| PLAN           | -  | -  | -  | Y  | -  | -  | -  | -  | Y  |
| PLIB           | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| PnLIB          | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| PLI2LIB        | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| PLILIB         | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| PLILOAD        | Y  | -  | -  | -  | -  | Y  | -  | -  | -  |
| POPTION        | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| PRECOMP        | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| PRELINK        | -  | -  | -  | -  | -  | -  | Y  | -  | -  |
| PRINT          | Y  | Y  | Y  | -  | -  | Y  | -  | Y  | -  |
| PSECPAC        | Y  | Y  | Y  | -  | -  | Y  | -  | -  | Y  |
| PSPACE         | Y  | Y  | Y  | -  | -  | Y  | -  | -  | Y  |
| P/QUALIFIER    | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| RCTERM         | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y  |
| P/RELEASE      | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| REMOTE         | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| P/REOPT        | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| REPLVER        | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| RETAIN         | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| RUN            | -  | Y  | Y  | -  | -  | -  | -  | Y  | Y  |
| RUNIN          | -  | -  | -  | -  | -  | -  | -  | -  | Y  |
| RUNOUT         | -  | -  | -  | -  | -  | -  | -  | -  | Y  |
| SOURCE         | Y  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| SPACEUN        | Y  | Y  | Y  | -  | -  | Y  | -  | -  | Y  |
| SQL            | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| SQLDELIM       | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| SQLERROR       | -  | -  | -  | -  | Y  | -  | -  | -  | -  |
| SQLFLAG        | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| SQLRULES       | -  | -  | -  | Y  | -  | -  | -  | -  | -  |
| STDSQL         | -  | Y  | -  | -  | -  | -  | -  | -  | -  |

Table 12 (Page 2 of 2). Summary of DSNH CLIST Parameters

| OPTIONS    | MP | PC | TR | BI | BP | CO | PL | LE | RU |
|------------|----|----|----|----|----|----|----|----|----|
| SUFFIX     | Y  | Y  | -  | -  | -  | -  | -  | -  | -  |
| SYSTEM     | -  | -  | -  | *  | *  | -  | -  | -  | Y  |
| TERM       | Y  | Y  | -  | -  | -  | Y  | -  | Y  | -  |
| TIME       | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| P/VALIDATE | -  | -  | -  | Y  | Y  | -  | -  | -  | -  |
| VERSION    | -  | Y  | -  | -  | -  | -  | -  | -  | -  |
| WORKUNIT   | Y  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| WSECSPAC   | Y  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| WSPACE     | Y  | Y  | Y  | -  | -  | Y  | -  | -  | -  |
| XLIB       | -  | -  | -  | -  | -  | -  | -  | Y  | -  |
| XREF       | Y  | Y  | -  | -  | -  | Y  | -  | Y  | -  |

## General Parameter Descriptions

Due to similarities in name and function, the CLIST parameters for BIND PLAN and BIND PACKAGE are described separately from the parameters in Table 13. For a summary of:

- BIND PLAN parameters, see Table 14 on page 193
- BIND PACKAGE parameters, see Table 15 on page 196.

Also see “DSNH/DSN Subcommand Summary” on page 193 for a description of conventions used in those tables.

The only parameter required on the DSNH statement is INPUT; the others are optional. In the table of general parameters that follow:

- Parameter values must be enclosed between parentheses.
- Parameter values need not be enclosed between apostrophes. However,
  - If the value is a list of tokens with separators, it must be enclosed between apostrophes.
  - If the value is a data set name, your user identifier is prefixed to it. To avoid the prefix, enclose the name between sets of three apostrophes.
- Most parameter values that are data set names (*dsname*) cannot include member names. Exceptions are noted in the parameter descriptions.
- Underlined values are defaults. Default names can be changed to names specific to your site when DB2 is installed.

Table 13 (Page 1 of 13). General DSNH CLIST Parameters

| DSNH CLIST |               |                                                                                                                                                                             |
|------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value         | Comments                                                                                                                                                                    |
| ASMLIB     | <i>dsname</i> | Specifies a data set to be used as the standard MACLIB for High Level Assembler/MVS.<br>The <b>default</b> is “‘SYS1.MACLIB’”.                                              |
| ASMLOAD    | <i>dsname</i> | Specifies a data set that contains the High Level Assembler/MVS load module.<br><i>dsname</i> can include a member name.<br>The <b>default</b> is “‘SYS1.LINKLIB(ASMA90)’”. |

## DSNH (TSO CLIST)

Table 13 (Page 2 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                   |                                                                                                                                                                                                                                                                                                                       |
|------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                             | Comments                                                                                                                                                                                                                                                                                                              |
| CCLINK     | <i>dsname</i>                     | <p>Specifies a data set that contains the C compiler prelink utility invocation load module.</p> <p><i>dsname</i> can include a member name.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““CEE.V1R3M0.SCEERUN(EDCPRLK)””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CEE.V1R4M0.SCEERUN(EDCPRLK)””.</p>  |
| CCLLIB     | <i>dsname</i>                     | <p>Specifies the data set that contains the linkage editor include modules for the C compiler routines.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““CEE.V1R3M0.SCEELKED””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CEE.V1R4M0.SCEELKED””.</p>                                                       |
| CCLOAD     | <i>dsname</i>                     | <p>Specifies a data set that contains the C compiler invocation load module.</p> <p><i>dsname</i> can include a member name.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““EDC.V1R2M0.SEDCDCMP(EDCDC120)””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CBC.V3R1M0.SCBC3CMP(CBC310)””.</p>                |
| CCMSGS     | <i>dsname</i>                     | <p>Specifies a data set that contains the C compiler messages.</p> <p><i>dsname</i> can include a member name.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““EDC.V1R2M0.SEDCDMSG(EDCMSGE)””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CBC.V3R1M0.SCBC3MSG(EDCMSGE)””.</p>                              |
| CCOLIB     | <u>NONE</u><br><i>dsname</i>      | Specifies the data set that contains C object modules to be included during the execution of the prelink utility step.                                                                                                                                                                                                |
| CCPLIB     | <u>NONE</u><br><i>dsname</i>      | Specifies the data set containing include modules for PLI routines. This parameter is used only for IBM C/370 Version 2 or earlier.                                                                                                                                                                                   |
| CCPMSGS    | <i>dsname</i>                     | <p>Specifies the data set containing prelink utility error messages.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““CEE.V1R3M0.SCEEMSGP(EDCPMSGE)””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CEE.V1R4M0.SCEEMSGP(EDCPMSGE)””.</p>                                                                      |
| CCSLIB     | <i>dsname</i>                     | <p>Specifies the data set that contains the C compiler headers.</p> <p>The <b>default</b> for <b>HOST(C)</b> is ““EDC.V1R2M0.SEDCDHDR””.</p> <p>The <b>default</b> for <b>HOST(CPP)</b> is ““CBC.V1R4M0.SCEEH.H””.</p>                                                                                                |
| CICSOPT    | <u>NONE</u><br><i>option-list</i> | <p>Gives a list of additional CICS translator options. See the appropriate CICS application programming reference for information about translator options.</p> <p>NONE gives no additional options.</p>                                                                                                              |
| CICSPRE    | <i>prefix</i>                     | <p>Gives the prefix for the CICS libraries. The library names are:</p> <p><i>prefix</i>.LOADLIB for translators<br/> <i>prefix</i>.PL1LIBn for PL/I include<br/> <i>prefix</i>.COBLIB for COBOL include</p> <p>Leave this parameter blank to use CICSLLIB, CICSPLIB, CICSJOB.</p> <p>The <b>default</b> is blank.</p> |
| CICSLLIB   | <i>dsname</i>                     | <p>Specifies the CICS load library. To use this library, leave the CICSPRE parameter blank.</p> <p>The <b>default</b> is set on install panel DSNTIP3.</p>                                                                                                                                                            |

Table 13 (Page 3 of 13). General DSNH CLIST Parameters

| DSNH CLIST                |                                |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
|---------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------|----|-----------------------|----|-----------------------|----|--------------------------------|----|--------------------------|
| Parameter                 | Value                          | Comments                                                                                                                                                                                                                                                                                                                                                                                                                      |       |              |    |                       |    |                       |    |                                |    |                          |
| CICSPLIB                  | <i>dsname</i>                  | Specifies the CICS PL/I library. To use this library, leave the CICSPRE parameter blank.<br><br>The <b>default</b> is set on install panel DSNTIP3.                                                                                                                                                                                                                                                                           |       |              |    |                       |    |                       |    |                                |    |                          |
| CICSCOB                   | <i>dsname</i>                  | Specifies the CICS COBOL library. To use this library, leave the CICSPRE parameter blank.<br><br>The <b>default</b> is set on install panel DSNTIP3.                                                                                                                                                                                                                                                                          |       |              |    |                       |    |                       |    |                                |    |                          |
| CICSVER                   | 21<br>31<br><u>33</u><br>41    | Specifies the CICS release, as follows:<br><br><table border="0"> <thead> <tr> <th>Value</th> <th>CICS Release</th> </tr> </thead> <tbody> <tr> <td>21</td> <td>Using CICS/MVS 2.1.2.</td> </tr> <tr> <td>31</td> <td>Using CICS/ESA 3.1.1.</td> </tr> <tr> <td>33</td> <td>Using CICS/ESA 3.2.1 or 3.3.0.</td> </tr> <tr> <td>41</td> <td>Using CICS/ESA Version 4</td> </tr> </tbody> </table><br>The <b>default</b> is 33. | Value | CICS Release | 21 | Using CICS/MVS 2.1.2. | 31 | Using CICS/ESA 3.1.1. | 33 | Using CICS/ESA 3.2.1 or 3.3.0. | 41 | Using CICS/ESA Version 4 |
| Value                     | CICS Release                   |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| 21                        | Using CICS/MVS 2.1.2.          |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| 31                        | Using CICS/ESA 3.1.1.          |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| 33                        | Using CICS/ESA 3.2.1 or 3.3.0. |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| 41                        | Using CICS/ESA Version 4       |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| CICSXLAT                  | NO<br>YES                      | Tells whether to execute the CICS command translator. The option is effective only if you use RUN(CICS). You cannot use the option with the MARGINS option of the translator.<br><br>The <b>default</b> is YES. The DB2I panel <b>default</b> is NO.                                                                                                                                                                          |       |              |    |                       |    |                       |    |                                |    |                          |
| CLIB<br>C<br><i>n</i> LIB | <u>NONE</u><br><i>dsname</i>   | Specifies a data set that contains host language source statements to be included by the compiler or assembler. The parameters <i>Cn</i> LIB (where <i>n</i> can be 2, 3, or 4) are extensions of CLIB, used to simplify passing a list of data set names.<br><br>Use NONE to specify no data set.                                                                                                                            |       |              |    |                       |    |                       |    |                                |    |                          |
| COBICOMP                  | <i>dsname</i>                  | Specifies the IBM COBOL data set required for compilation.<br><br>The <b>default</b> is “‘‘IGY.V1R2M0.SIGYCOMP’’”.                                                                                                                                                                                                                                                                                                            |       |              |    |                       |    |                       |    |                                |    |                          |
| COBILINK                  | <i>dsname</i>                  | Specifies the IBM COBOL data set required for link edit.<br><br>The <b>default</b> is “‘‘CEE.V1R5M0.SCEELKED’’”.                                                                                                                                                                                                                                                                                                              |       |              |    |                       |    |                       |    |                                |    |                          |
| COBIPLNK                  | <i>dsname</i>                  | Specifies the IBM COBOL data set required for prelink routines.<br><br>The <b>default</b> is “‘‘CEE.V1R5M0.SCEERUN’’”.                                                                                                                                                                                                                                                                                                        |       |              |    |                       |    |                       |    |                                |    |                          |
| COBIPMSG                  | <i>dsname</i>                  | Specifies the IBM COBOL data set required for prelink messages.<br><br>The <b>default</b> is “‘‘CEE.V1R5M0.SCEEMSGP(EDCPMSGE)’’”.                                                                                                                                                                                                                                                                                             |       |              |    |                       |    |                       |    |                                |    |                          |
| COBLIB                    | <i>dsname</i>                  | Specifies the linkage editor include library to be used for OS/VS COBOL routines.<br><br>The <b>default</b> is “‘‘SYS1.COBLIB’’”.                                                                                                                                                                                                                                                                                             |       |              |    |                       |    |                       |    |                                |    |                          |
| COBLOAD                   | <i>dsname</i>                  | Specifies a data set that contains the OS/VS COBOL compiler load module.<br><i>dsname</i> can include a member name.<br><br>The <b>default</b> is “‘‘SYS1.LINKLIB(IKFCBL00)’’”.                                                                                                                                                                                                                                               |       |              |    |                       |    |                       |    |                                |    |                          |
| COBSOM                    | <i>dsname</i>                  | Specifies the IBM System Object Model (SOM) data set required for access to SOM objects.<br><br>The <b>default</b> is “‘‘SOMMVS.V1R1M0.SGOSPLKD’’”.                                                                                                                                                                                                                                                                           |       |              |    |                       |    |                       |    |                                |    |                          |
| COB2CICS                  | <i>dsname</i>                  | Specifies the linkage editor include library to be used for VS COBOL II CICS routines.<br><br>The <b>default</b> is “‘‘SYS1.COB2CICS’’”.                                                                                                                                                                                                                                                                                      |       |              |    |                       |    |                       |    |                                |    |                          |

## DSNH (TSO CLIST)

Table 13 (Page 4 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                     | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| COB2LIB    | <i>dsname</i>                             | Specifies the linkage editor include library to be used for the VS COBOL II or COBOL/370 routines.<br><br>The <b>default</b> is “SYS1.V1R3.COB2LIB”.                                                                                                                                                                                                                                                                                                    |
| COB2LOAD   | <i>dsname</i>                             | Specifies a data set that contains the VS COBOL II or COBOL/370 compiler load module.<br><br><i>dsname</i> can include a member name.<br><br>The <b>default</b> is “SYS1.V1R3.COB2COMP(IGYCRCTL)”.                                                                                                                                                                                                                                                      |
| COMPILE    | <u>YES</u><br>NO                          | Tells whether to execute the compiler or assembler if the precompile step is successful.                                                                                                                                                                                                                                                                                                                                                                |
| CONNECT    | (1)<br>(2)                                | Specifies whether a CONNECT SQL statement should be processed as a type 1 CONNECT or a type 2 CONNECT statement. The DSNH(TSO CLIST) command does not accept the CT(1) and CT(2) abbreviations for this precompiler option.<br><br>The <b>default</b> is CONNECT(2).                                                                                                                                                                                    |
| CONTROL    | <u>NONE</u><br>CONLIST<br>LIST<br>SYMLIST | CONTROL helps you trace the allocation of non-existent data sets. Use CONTROL if you have a problem without an obvious cause.<br><br>CONLIST displays CLIST commands after substitution for symbols and before command execution.<br><br>LIST displays TSO commands after substitution for symbols and before command execution.<br><br>SYMLIST displays all executable statements (TSO commands and CLIST statements) before substitution for symbols. |
| COPTION    | <u>NONE</u><br><i>string</i>              | Gives a list of compiler or assembler options. For more information, see the manual that describes the compiler or assembler options for the specific language you are using. For a list of restrictions on some options, see COBOL Options on page 199.<br><br>NONE gives no options.                                                                                                                                                                  |
| CPPCLASS   | <i>dsname</i>                             | Specifies the data set containing C++ class libraries.<br><br>The <b>default</b> is “CBC.V3R1M0.SCLB3CPP”.                                                                                                                                                                                                                                                                                                                                              |
| CPPCLINK   | <i>dsname</i>                             | Specifies the data set containing prelink utility modules used by the C++ compiler.<br><br>The <b>default</b> is “CEE.V1R4M0.SCEERUN(EDCPRLK)”.                                                                                                                                                                                                                                                                                                         |
| CPPCLLIB   | <i>dsname</i>                             | Specifies the data set for C linkage editor automatic call library used by the C++ compiler.<br><br>The <b>default</b> is “CEE.V1R4M0.SCEELKED”.                                                                                                                                                                                                                                                                                                        |
| CPPCSLIB   | <i>dsname</i>                             | Specifies data set containing the C compiler headers used by the C++ compiler.<br><br>The <b>default</b> is “CBC.V1R4M0.SCEEH.H”.                                                                                                                                                                                                                                                                                                                       |
| CPPLLIB    | <i>dsname</i>                             | Specifies the data set containing the C++ prelink automatic call library.<br><br>The <b>default</b> is “CEE.V1R4M0.SCEECP”.                                                                                                                                                                                                                                                                                                                             |
| CPPPMMSG   | <i>dsname</i>                             | Specifies the data set containing prelink utility error messages used by the C++ compiler.<br><br>The <b>default</b> is “CEE.V1R4M0.SCEEMSGP(EDCPMSGE)”.                                                                                                                                                                                                                                                                                                |

Table 13 (Page 5 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                           | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CPPSLIB    | <i>dsname</i>                                   | Specifies the data set containing C++ header files for class libraries.<br>The <b>default</b> is ““CBC.V3R1M0.SCLB3H.H””.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| CPPUTIL    | <i>dsname</i>                                   | Specifies the data set containing procedures to set up and execute the C++ compiler.<br>The <b>default</b> is ““CBC.V3R1M1.SCBC3UTL””.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| DATE       | ISO<br>JIS<br>USA<br>EUR<br>LOCAL               | Specifies the format of date values that are to be returned overriding the format specified as the location default.<br>The <b>default</b> is the value supplied when DB2 was installed, and is written in the data-only load module, DSNHDECP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DBRMLIB    | <u>DEFAULT</u><br><i>dsname(member)</i><br>NONE | Specifies the partitioned data set, and optionally a member name, that contains the DBRM library and member name used during the DB2 precompile step. Because you can specify an individual DBRM member and library names during each individual phase, you must use the DBRMLIB parameter and associated prefixes to identify a specific phase. DBRMLIB specifies the DBRM library and member defined on the DBRMLIB DD statement during DB2 precompiler processing.<br><br>DEFAULT indicates that the same DBRM library data set defined for the DB2 precompiler process (DBRMLIB( <i>parameter</i> )) is also used on the LIBRARY( <i>dsname</i> ) subcommand keyword. If the precompiler DBRMLIB was not specified, then the default generated DBRMLIB library based upon the INPUT data set name is used.<br><br><i>dsname</i> is generated using the DSNH OUTNAME parameter value, or its default TEMP, with the constant DBRM appended to the prefix; for example, <i>outname</i> .DBRM or TEMP.DBRM.<br><br><i>member</i> is obtained from the data set member name specified on the DSNH INPUT parameter, or from the data set name as follows:<br><br>Given INPUT( <i>outname</i> .DBRM( <i>dbrmmem</i> )):<br><ul style="list-style-type: none"> <li>• <i>outname</i>.DBRM(<i>dbrmmem</i>) - If member name is specified</li> <li>• <i>outname</i>.DBRM(<i>dbrm</i>) - If no member name is specified</li> </ul> NONE indicates that no LIBRARY( <i>dsname</i> ) subcommand keyword is specified on invocation. |
| DECARTH    | <u>DEFAULT</u><br>15<br>31                      | Sets the maximum precision of decimal numbers.<br><br>DEFAULT designates the value chosen, during installation, for the DECIMAL ARITHMETIC field on the APPLICATION PROGRAMMING DEFAULTS panel.<br><br>15 specifies that decimal arithmetic operations on decimal values with precision 15 or less are performed in accordance with the existing rules for determining the precision and scale of the result.<br><br>31 specifies that decimal arithmetic operations on decimal values with precision 15 to 31 are performed in accordance with new rules for determining the precision and scale of the result.<br><br>DECARTH is ignored for FORTRAN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## DSNH (TSO CLIST)

Table 13 (Page 6 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                            | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| DECIMAL    | COMMA<br>PERIOD                  | <p>Gives the decimal point indicator for decimal and floating point literals. DECIMAL is valid only for COBOL programs; PERIOD is forced for all other programs.</p> <p>COMMA makes the indicator a comma.</p> <p>PERIOD makes the indicator a period.</p> <p>The <b>default</b> is the value of the DECIMAL POINT field, set on the DB2 APPLICATION PROGRAMMING DEFAULTS panel during installation.</p>                                                                                                                                                                                                                                                                 |
| DELIMIT    | <u>DEFAULT</u><br>APOST<br>QUOTE | <p>Sets the APOST or QUOTE precompiler option to indicate the string delimiter used within host language statements. DELIMIT is effective only for COBOL programs; APOST is forced for all other programs.</p> <p>DEFAULT designates the value chosen, during installation, for the STRING DELIMITER field on the APPLICATION PROGRAMMING DEFAULTS panel.</p> <p>APOST specifies the apostrophe as the string delimiter for host language statements.</p> <p>QUOTE specifies a quotation mark as the string delimiter for host language statements.</p>                                                                                                                  |
| ENTRY      | <i>entry-name</i>                | <p>Specifies the entry point assigned by the linkage editor.</p> <p>The <b>default</b> depends on the host language and the value of RUN.</p> <ul style="list-style-type: none"> <li>For the PL/I language, the ENTRY value default is: <ul style="list-style-type: none"> <li>NONE if the RUN value is CICS</li> <li>PLISTART for any other RUN value.</li> </ul> </li> <li>For the ASM language, the ENTRY value default is DLITASM if the RUN value is IMS.</li> <li>For COBOL, the ENTRY value default is DLITCBL if the RUN value is IMS.</li> <li>For any other language, the ENTRY value default is NONE (no specified entry point) for any RUN value.</li> </ul> |
| FLAG       | I<br>C<br>E<br>W                 | <p>Tells what messages you want to see. Use one of the values listed to show messages of the corresponding types:</p> <ul style="list-style-type: none"> <li>I All informational, warning, error, and completion messages</li> <li>W Only warning, error, and completion messages</li> <li>E Only error and completion messages</li> <li>C Only completion messages</li> </ul>                                                                                                                                                                                                                                                                                           |
| FORTLIB    | <i>dsname</i>                    | <p>Specifies the linkage editor include library to be used for FORTRAN routines.</p> <p>The <b>default</b> is “SYS1.VSF2FORT”.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| FORTLOAD   | <i>dsname</i>                    | <p>Specifies a data set that contains the VS FORTRAN compiler load module. <i>dsname</i> can include a member name.</p> <p>The <b>default</b> is “SYS1.VSF2VCOMP(FORTVS2)”.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| GRAPHIC    | <u>NONE</u><br>NO<br>YES         | <p>Specifies the value of the DSNHDECP MIXED option for the precompiler.</p> <p>NONE indicates that the default specified during install is used.</p> <p>NO indicates that the data is <b>not</b> mixed DBCS.</p> <p>YES indicates that all character data can be mixed DBCS.</p> <p>GRAPHIC is ignored for C.</p>                                                                                                                                                                                                                                                                                                                                                       |



Table 13 (Page 7 of 13). General DSNH CLIST Parameters

| DSNH CLIST                 |                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter                  | Value                                                        | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| HOST                       | ASM<br>C<br>CPP<br>COBOL<br>COB2<br>IBMCOB<br>FORTRAN<br>PLI | <p>Defines the host language within which SQL statements are embedded.</p> <p>If your program fits one of these descriptions:</p> <ul style="list-style-type: none"> <li>a IBM COBOL for MVS &amp; VM program that uses object-oriented extensions</li> <li>a C++ program that uses object-oriented extensions and consists of more than one compilation unit</li> </ul> <p>you cannot use DB2I to prepare it.</p> <p>The <b>default</b> is the value of the LANGUAGE DEFAULT field, set on the DB2 APPLICATION PROGRAMMING DEFAULTS panel during installation.</p> |
| IMSPRE                     | <i>prefix</i>                                                | <p>Sets the prefix for RESLIB, used for routines to be included by the linkage editor for IMS.</p> <p>The <b>default</b> is IMSVS.</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| INPUT                      | <i>dsname</i>                                                | <p>Specifies the data set that contains the host language source and SQL statements.</p> <p><i>dsname</i> can include a member name.</p>                                                                                                                                                                                                                                                                                                                                                                                                                            |
| LINECOUNT                  | <i>integer</i>                                               | <p>Tells how many lines, including headings, are to be printed on each page of printed output.</p> <p>The <b>default</b> is 60.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LINK                       | <u>YES</u><br>NO                                             | <p>Tells whether to execute the linkage editor upon successful completion of compilation or assembly.</p> <p>YES indicates that the linkage editor is to be executed. The DSNHLI entry point from the precompiler is directed to the appropriate language interface module specified by the RUN parameter.</p> <p>NO indicates that linkage editor processing is to be bypassed.</p>                                                                                                                                                                                |
| LLIB<br>L <sub>n</sub> LIB | <u>NONE</u><br><i>dsname</i>                                 | <p>Specifies a data set that contains object or load modules to be included by the linkage editor. The parameters L<sub>n</sub>LIB (where <i>n</i> can be 2, 3, or 4) are extensions of LLIB, used to simplify passing a list of data set names.</p> <p>The LLIB and L<sub>n</sub>LIB libraries are concatenated with the XLIB library and the linkage editor include libraries for the specific host language. Object and load module libraries must not be mixed in this concatenation.</p> <p>Use NONE to specify no data set.</p>                               |
| LOAD                       | <i>dsname</i>                                                | <p>Specifies a data set that is to contain the output from the linkage editor (the load module).</p> <p><i>dsname</i> can include a member name.</p> <p>The <b>default</b> is RUNLIB.LOAD.</p>                                                                                                                                                                                                                                                                                                                                                                      |
| LOPTION                    | <u>NONE</u><br><i>string</i>                                 | <p>Gives a list of linkage editor options. For information on options you can use, see the appropriate MVS/ESA publication.</p> <p>Use NONE to give no options.</p>                                                                                                                                                                                                                                                                                                                                                                                                 |
| MACRO                      | <u>YES</u><br>NO                                             | <p>Tells whether the macro preprocessor is to be executed before the precompilation of a PL/I program. If the PL/I macro processor is used, the PL/I *PROCESS statement must not be used to pass options to the PL/I compiler. The COPTION parameter of the DSNH command can be used to pass the needed options to the PL/I compiler.</p>                                                                                                                                                                                                                           |

## DSNH (TSO CLIST)

Table 13 (Page 8 of 13). General DSNH CLIST Parameters

| DSNH CLIST           |                              |                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter            | Value                        | Comments                                                                                                                                                                                                                                                                                                                                                                   |
| NOFOR                | <u>NO</u>                    | Allows elimination of all FOR UPDATE OF clauses in static SQL.                                                                                                                                                                                                                                                                                                             |
|                      | YES                          | When NOFOR is in effect, the FOR UPDATE OF clause is optional. Positioned updates can be made to any columns that the user has authority to update.                                                                                                                                                                                                                        |
|                      |                              | When NOFOR is not in effect, any query appearing in a DECLARE CURSOR statement must contain a FOR UPDATE OF clause if the cursor is used for positional updates. The clause must designate all the columns that the cursor can update.<br><br>The option is implied when the STDSQL(YES) option is in effect.                                                              |
| OPTIONS              | <u>NO</u><br>YES             | Tells whether to print the options used when executing the precompiler or the CICS command translator with the output listing.                                                                                                                                                                                                                                             |
| OUTNAME              | <u>TEMP</u><br><i>string</i> | Gives a prefix used to form intermediate data set names.<br><br><i>string</i> must not be enclosed between apostrophes and must not have the same initial character as the <i>dsname</i> for INPUT. It cannot contain special characters.                                                                                                                                  |
| PARMS                | <u>NONE</u><br><i>string</i> | Gives a parameter string to be passed to the compiled program during its execution; the run time execution environment requested is TSO. If CAF is specified as the run time execution environment, this parameter is ignored.<br><br>Use NONE to pass no parameter string.                                                                                                |
| PASS                 | ONE or 1                     | Tells how many passes the precompiler is to use. One pass saves processing time, but requires that declarations of host variables in the program precede any reference to those variables. PASS has no effect for COBOL or FORTRAN; ONE is forced.                                                                                                                         |
|                      | TWO or 2                     | The <b>default</b> is ONE or 1 for PL/I and C.<br><br>The <b>default</b> is TWO or 2 for assembler.                                                                                                                                                                                                                                                                        |
| PCLOAD               | <i>dsname</i>                | Specifies the precompiler load module.<br><br><i>dsname</i> can include a member name.<br><br>The <b>default</b> is “ <i>prefix</i> .SDSNLOAD(DSNHPC)”.                                                                                                                                                                                                                    |
| PLAN                 | <i>plan-name</i>             | Specifies the application plan created by the bind process.<br><br>The <b>default</b> plan name is the first of the following available choices defined in the INPUT data set: <ul style="list-style-type: none"> <li>• DBRM member name</li> <li>• Leftmost qualifier</li> </ul> <i>plan-name</i> must not be DEFAULT.<br><br>If no name is found, a plan is not created. |
| PLIB<br><i>PnLIB</i> | <u>NONE</u><br><i>dsname</i> | Specifies the data set that contains host language source or SQL statements included by the SQL INCLUDE statement during precompilation. The parameters <i>PnLIB</i> (where <i>n</i> can be 2, 3, or 4) are extensions of PLIB, used to simplify passing a list of data set names.<br><br>Use NONE to specify no data set.                                                 |
| PLI2LIB              | <i>dsname</i>                | Specifies the linkage editor common library used for PL/I routines.<br><br>The <b>default</b> is “SYS1.SIBMBASE”.                                                                                                                                                                                                                                                          |

Table 13 (Page 9 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PLILIB     | <i>dsname</i>                                 | Specifies the linkage editor base library used for PL/I routines.<br>The <b>default</b> is “SYS1.PLIBASE”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PLILOAD    | <i>dsname</i>                                 | Specifies a data set that contains the PL/I optimizing compiler load module.<br><i>dsname</i> can include a member name.<br>The <b>default</b> is “SYS1.LINKLIB(IEL0AA)”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| POPTION    | <u>NONE</u><br><i>string</i>                  | Gives a list of the C compiler language prelink utility options. For information on the options provided, refer to the <i>IBM SAA AD/Cycle C/370 User's Guide</i><br>Use NONE to give no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| PRECOMP    | <u>YES</u><br>NO                              | Tells whether to precompile.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PRELINK    | <u>YES</u><br>NO                              | Tells whether to execute the C compiler prelink utility to make your program reentrant. This utility concatenates compile-time initialization information (for writable static) from one or more text decks into a single initialization unit. If this step is requested, it must follow the compile step and precede the link-edit step.<br><br>This parameter can apply to IBMCOB that also has a prelink step. Whether the prelink step applies to C or IBMCOB is determined by the choice of values C, CPP, or IBMCOB for the HOST parameter.<br><br>Descriptions of the prelink process for C and IBMCOB are presented in their respective language publications.<br><br>If PRELINK(YES) is specified or defaulted for a HOST language compiler that does not support the prelink utility, DB2 will issue warning message DSNH760I and prelink utility processing will be bypassed.                                                                                                                                                                                                                                                                                                                                                             |
| PRINT      | <u>NONE</u><br><i>dsname</i><br>LEAVE<br>TERM | Tells where to send printed output, including the lists of options, source, cross-reference, error, and summary information.<br><br>NONE omits printed output.<br><br><i>dsname</i> specifies a data set to be used for the output. Do not enclose <i>dsname</i> between apostrophes. The current user profile is prefixed to <i>dsname</i> . The following suffixes are also added: <ul style="list-style-type: none"> <li>• SYSCPRT.LIST for PL/I macro listings (these listings are overwritten by the compiler listings)</li> <li>• PCLIST for precompiler listings</li> <li>• CXLIST for CICS command translator listings</li> <li>• LIST for compiler listings</li> </ul> <p>The PRINT parameter is ignored for the compile step when HOST(CPP) is specified.</p> <ul style="list-style-type: none"> <li>• SYSOUT.PRELLIST for C prelink utility listings</li> <li>• LINKLIST for link-edit listings</li> </ul> LEAVE sends output to the specified print data set. You can allocate the print data set: <ul style="list-style-type: none"> <li>• Dynamically</li> <li>• In the JCL used to run the DSNH CLIST (if in batch mode)</li> <li>• With the TSO ALLOCATE command (before running DSNH)</li> </ul> TERM sends output to the terminal. |

## DSNH (TSO CLIST)

Table 13 (Page 10 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                                           | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PSECSPAC   | <i>integer</i>                                                  | Tells the amount of secondary space to allocate for print data sets, in the units given by SPACEUN.<br><br>The <b>default</b> is 20.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PSPACE     | <i>integer</i>                                                  | Tells the primary size of the print data sets in the units given by SPACEUN.<br><br>The <b>default</b> is 20.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| RCTERM     | <i>integer</i>                                                  | Gives the least value of the return code from the precompile step that prevents execution of later steps.<br><br>The <b>default</b> is 8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| RUN        | <u>TSO or YES</u><br>BATCH or NO<br>CAF<br>CICS<br>IMS<br>RRSAF | Tells whether to execute the compiled program if the previous steps are successful, and, if so, in which environment it executes. Your choice for the RUN parameter might affect your choice for LLIB.<br><br>TSO or YES indicate that the application program is to be scheduled for execution in the TSO environment, and execute the compiled program.<br><br>BATCH or NO indicate that the application program is not to be scheduled for execution, and default to TSO as the execution environment.<br><br>CAF indicates that the application program is to be scheduled for execution in the call attachment facility environment. Specify BATCH or NO with CAF to indicate that the application program is not to be scheduled for execution, but to identify CAF as the execution environment. (BATCH,CAF) or (NO,CAF)<br><br>CICS indicates that the application program is not to be scheduled for execution, and identifies CICS as the RUN time execution environment. (CICS applications cannot run in TSO.)<br><br>IMS indicates that the application program is not to be scheduled for execution, and identifies IMS as the RUN time execution environment. (IMS applications cannot run in TSO.)<br><br>RRSAF indicates that the application program is not to be scheduled for execution, and identifies RRSAF as the RUN time execution environment. (RRSAF applications cannot run in TSO.) |
| RUNIN      | <u>TERM</u><br><i>dsname</i><br>LEAVE<br>NONE                   | Tells where to get input for the RUN step.<br><br>TERM gets input from the terminal.<br><br><i>dsname</i> specifies a data set to be used for the input.<br><br>LEAVE gets input from SYSIN if the only steps taken are LINK and RUN. LEAVE gets input from FT05F001 if the language is FORTRAN. Do not use LEAVE for any other cases.<br><br>NONE allocates no input file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| RUNOUT     | <u>TERM</u><br><i>dsname</i><br>LEAVE<br>NONE                   | Tells where to send output from the RUN step.<br><br>TERM sends output to the terminal.<br><br><i>dsname</i> specifies a data set to receive output.<br><br>LEAVE sends output to SYSPRINT if the only steps taken are LINK and RUN. LEAVE sends output to FT06F001 if the language is FORTRAN. Do not use LEAVE for any other cases.<br><br>NONE allocates no output file for the RUN step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 13 (Page 11 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                                            | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SOURCE     | <u>NO</u><br>YES                                                 | Tells whether the source code and diagnostics are to be printed with output from the precompiler, CICS command translator, and compiler.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SPACEUN    | <u>TRACK</u><br>CYLINDER                                         | Specifies the unit of space for PSPACE and WSPACE.<br>TRACK makes the space unit one track.<br>CYLINDER makes the space unit one cylinder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SQL        | <u>DB2</u><br>ALL                                                | Interprets SQL statements and checks syntax for use by either DB2 for OS/390 or other database management systems.<br><br>DB2 indicates that SQL statements are to be interpreted and syntax is to be checked for use by DB2. SQL(DB2) is the recommended mode for DRDA access when the server is a DB2 subsystem.<br><br>ALL indicates that SQL statements are to be interpreted for use by database management systems that are not DB2 for OS/390. SQL syntax checking is deferred until bind time so that the remote location can bind the resulting DBRM. When SQL(ALL) is in effect, the precompiler issues an informational message if SAA reserved words are used as identifiers. SQL(ALL) is the recommended mode if you have written your application to be executed in an environment that is not DB2 for OS/390.<br><br>The <b>default</b> is SQL( <u>DB2</u> ). |
| SQLDELIM   | <u>DEFAULT</u><br>APOSTSQL<br>QUOTESQL                           | Sets the APOSTSQL or QUOTESQL precompiler option, to specify the SQL string delimiter and, by implication, the SQL escape character within SQL statements. Whichever character is chosen to be the string delimiter, the other is used for the SQL escape character.<br><br>This parameter is effective only for COBOL. For PL/I, FORTRAN, and assembler language programs, the precompiler forces the APOSTSQL option.<br><br>DEFAULT designates the value chosen, during installation, for the SQL STRING DELIMITER field on the APPLICATION PROGRAMMING DEFAULTS panel.<br><br>APOSTSQL specifies that the string delimiter is the apostrophe (') and the escape character is the quotation mark (").<br><br>QUOTESQL specifies that the string delimiter is the quotation mark (") and the escape character is the apostrophe (').                                       |
| SQLFLAG    | IBM or SAA<br>STD or 86<br><br><i>ssname</i><br><i>qualifier</i> | Specifies the standard to be used to check the syntax of SQL statements. Deviations from the standard are flagged by informational messages written to the precompiler output listing.<br><br>IBM or SAA requests the use of the IBM SQL Version 2 syntax.<br>STD or 86 requests the use of the SQL92 Entry Level syntax.<br><br><i>ssname</i> requests full semantics checking for catalog access using the specified DB2 subsystem name. If <i>ssname</i> is not specified, only syntax checking is performed.<br><br><i>qualifier</i> specifies the qualifier to be used for unqualified object names. If <i>qualifier</i> is specified, <i>ssname</i> must always be specified first. If <i>qualifier</i> is not specified, the <b>default</b> is the authorization ID of the process that executed the precompiler.                                                     |

## DSNH (TSO CLIST)

Table 13 (Page 12 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                  | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| STDSQL     | NO<br>YES or 86                        | Interprets SQL using a subset of ANSI rules.<br>NO specifies that DB2 rules are used.<br>YES or 86 automatically implies that the NOFOR option is used.                                                                                                                                                                                                                                                                                                                                                                                           |
| SUFFIX     | YES<br>NO                              | Tells whether the TSO standard naming convention must be followed. That convention adds a TSO authorization ID prefix and a host language suffix to the name of the input data set (unless that name is enclosed between apostrophes, or already ends in the appropriate suffix). For example, names become <i>userid.name.COBOL</i> , <i>userid.name.PLI</i> , <i>userid.name.FORTRAN</i> , or <i>userid.name.ASM</i> .                                                                                                                          |
| SYSTEM     | <i>subsystem-name</i>                  | Gives the DB2 subsystem name as it is known to MVS.<br>The <b>default</b> is the installation-defined subsystem name (often DSN).                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TERM       | TERM<br><i>dsname</i><br>LEAVE<br>NONE | Tells where to send terminal output, including error information, error statements, and summary information.<br>TERM sends output to the terminal.<br><i>dsname</i> specifies a data set to be used for terminal output. Do not enclose <i>dsname</i> between apostrophes. The following suffixes are added to <i>dsname</i> : <ul style="list-style-type: none"> <li>• PCTERM for precompiler output</li> <li>• LIST for compiler output</li> </ul> LEAVE sends the output to the current allocation for SYSTERM.<br>NONE omits terminal output. |
| TIME       | ISO<br>JIS<br>USA<br>EUR<br>LOCAL      | Specifies the format for time values that are to be returned, overriding the format specified as the location default.<br>There is <b>no default</b> , because this option overrides the default previously specified.                                                                                                                                                                                                                                                                                                                            |
| VERSION    | <i>version-id</i><br>AUTO              | Specifies the name of the version ID for the program and associated DBRM during the DB2 precompile.<br>AUTO specifies that the consistency token is used to generate the version ID. If the consistency token is a timestamp, the timestamp is converted into ISO character format and used as the version identifier.<br>The <b>default</b> is no version ID if specified at precompiler invocation.                                                                                                                                             |
| WORKUNIT   | <i>unit</i>                            | Tells what device to use for print and work data sets.<br><i>unit</i> can be a unit name or a device type.<br>The <b>default</b> in batch mode is any eligible device.<br>The <b>default</b> in any other mode is the UADS unit name for the current TSO user.                                                                                                                                                                                                                                                                                    |
| WSECSPAC   | <i>integer</i>                         | Tells the amount of secondary space to allocate for work data sets, in the units given by SPACEUN.<br>The <b>default</b> is 20.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| WSPACE     | <i>integer</i>                         | Tells the primary size of the work data sets in the units given by SPACEUN.<br>The <b>default</b> is 20.                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 13 (Page 13 of 13). General DSNH CLIST Parameters

| DSNH CLIST |                  |                                                                                                                                               |
|------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value            | Comments                                                                                                                                      |
| XLIB       | <i>dsname</i>    | Specifies the linkage editor include library to be used for DB2 routines.<br><br>The <b>default</b> is ““ <i>prefix.SDSNLOAD</i> ””.          |
| XREF       | <u>NO</u><br>YES | Tells whether a sorted cross-reference listing of symbolic names used in source statements is to be printed with output from the precompiler. |

## DSNH/DSN Subcommand Summary

The following tables differentiate the functions that support BIND PLAN and BIND PACKAGE. Each table associates the DSNH CLIST parameter and its corresponding DSN BIND PLAN or BIND PACKAGE subcommand keyword, if any. In general:

- The function and value of a CLIST parameter is identical to that of its corresponding DSN subcommand keyword unless otherwise noted.
- A DSNH parameter value of NONE indicates that the corresponding DSN keyword is not specified on subcommand invocation. Exceptions are noted where applicable.

## DSNH CLIST/BIND PLAN Subcommand Comparison

Table 14 (Page 1 of 4). DSNH CLIST/ BIND PLAN Subcommand Summary

| DSNH CLIST |                                                                             | BIND PLAN subcommand    |                         | Comments                                                                                                                                                                                                                                                                                                                    |
|------------|-----------------------------------------------------------------------------|-------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                                                       | Keyword                 | Value                   |                                                                                                                                                                                                                                                                                                                             |
| ACQUIRE    | <u>USE</u><br>ALLOCATE                                                      | ACQUIRE                 | <u>USE</u><br>ALLOCATE  |                                                                                                                                                                                                                                                                                                                             |
| ACTION     | <u>REPLACE</u><br>ADD                                                       | ACTION                  | <u>REPLACE</u><br>ADD   |                                                                                                                                                                                                                                                                                                                             |
| BDMEM      | <u>DEFAULT</u> <sup>1</sup><br><i>dbrm-member-name</i><br>NONE <sup>2</sup> | MEMBER                  | <i>dbrm-member-name</i> | 1 DBRM member name obtained from one of the following sources, in the order listed: <ul style="list-style-type: none"> <li>• BDBRMLIB member name</li> <li>• DBRMLIB member name</li> <li>• INPUT member name, or generated using <i>dsname</i>.</li> </ul> <sup>2</sup> Keyword is not specified on subcommand invocation. |
| BIND       | <u>YES</u> <sup>1</sup><br>NO <sup>2</sup>                                  | ( <i>command-verb</i> ) |                         | 1 Execute BIND PLAN subcommand.<br><br>2 Do not execute BIND PLAN subcommand.                                                                                                                                                                                                                                               |
| BLIB       | <u>NONE</u> <sup>1</sup><br><i>dsname</i>                                   | LIBRARY                 | <i>dbrm-pds-name</i>    | <sup>1</sup> Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                             |

## DSNH (TSO CLIST)

Table 14 (Page 2 of 4). DSNH CLIST/ BIND PLAN Subcommand Summary

| DSNH CLIST         |                                                                           | BIND PLAN subcommand |                                   | Comments                                                                                                                                                                                                                                      |
|--------------------|---------------------------------------------------------------------------|----------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter          | Value                                                                     | Keyword              | Value                             |                                                                                                                                                                                                                                               |
| BnLIB <sup>1</sup> | <u>NONE</u> <sup>2</sup><br><i>dsname</i>                                 | LIBRARY              | <i>list of dbrm-pds-names</i>     | <p>1 <i>n</i> can be 2, 3, 4, 5, 6, 7, or 8. Specify the first data set name using the BLIB parameter and any additional data set names using this parameter.</p> <p>2 No additional data set names.</p>                                      |
| BMEM <sup>1</sup>  | <u>NONE</u> <sup>2</sup><br><i>list of dbrm-member-names</i>              | MEMBER               | <i>list of dbrm-member-names</i>  | <p>1 Specify the first DBRM member name using the BDMEM parameter and any additional member names individually using this parameter.</p> <p>2 No additional DBRM member names.</p>                                                            |
| CACHESIZE          | <u>NONE</u> <sup>1</sup><br><i>decimal-value</i> <sup>2</sup>             | CACHESIZE            | <i>decimal-value</i> <sup>2</sup> | <p>1 The size is provided by the subsystem.</p> <p>2 Specify a size from 0 to 4096 bytes.</p>                                                                                                                                                 |
| CICS               | <u>NONE</u> <sup>1</sup><br><i>application-ids</i>                        | CICS                 | <i>application-ids</i>            | 1Keyword is not specified on subcommand invocation.                                                                                                                                                                                           |
| CURRENTDATA        | <u>YES</u><br>NO<br>NONE                                                  | CURRENTDATA          | <u>YES</u><br>NO                  |                                                                                                                                                                                                                                               |
| CURRENTSERVER      | <u>NONE</u> <sup>1</sup><br><i>location-name</i>                          | CURRENTSERVER        | <i>location-name</i>              |                                                                                                                                                                                                                                               |
| BDBRMLIB           | <u>DEFAULT</u> <sup>1</sup><br><i>dsname(member)</i><br>NONE <sup>2</sup> | LIBRARY              | <i>dbrm-pds-name</i>              | <p>1 The precompiler DBRMLIB data set is used. If the pre-compiler DBRMLIB is not specified, then the default-generated DBRMLIB library based upon the INPUT data set is used.</p> <p>2Keyword is not specified on subcommand invocation.</p> |
| DEFER              | <u>NONE</u> <sup>1</sup><br>PREPARE                                       | DEFER                | PREPARE                           | 1Keyword is not specified on subcommand invocation.                                                                                                                                                                                           |
| DEGREE             | <u>1</u><br>ANY                                                           | DEGREE               | <u>1</u><br>ANY                   |                                                                                                                                                                                                                                               |



Table 14 (Page 3 of 4). DSNH CLIST/ BIND PLAN Subcommand Summary

| DSNH CLIST   |                                                                                             | BIND PLAN subcommand |                                                                                             | Comments                                                        |
|--------------|---------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Parameter    | Value                                                                                       | Keyword              | Value                                                                                       |                                                                 |
| DISABLE      | <u>NONE</u><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP          | DISABLE              | <u>NONE</u><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP          |                                                                 |
|              | RRSAF                                                                                       |                      | RRSAF                                                                                       |                                                                 |
| DISCONNECT   | <u>EXPLICIT</u><br>AUTOMATIC<br>CONDITIONAL                                                 | DISCONNECT           | <u>EXPLICIT</u><br>AUTOMATIC<br>CONDITIONAL                                                 |                                                                 |
| DLIBATCH     | <u>NONE</u> <sup>1</sup><br><i>list of<br/>connection-ids</i>                               | DLIBATCH             | <i>connection-name</i>                                                                      | <sup>1</sup> Keyword is not specified on subcommand invocation. |
| DYNAMICRULES | <u>RUN</u><br>BIND                                                                          | DYNAMICRULES         | <u>RUN</u><br>BIND                                                                          |                                                                 |
| ENABLE       | <u>NONE</u><br>*<br><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP | ENABLE               | <u>NONE</u><br>*<br><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP |                                                                 |
|              | RRSAF                                                                                       |                      | RRSAF                                                                                       |                                                                 |
| EXPLAIN      | <u>NO</u><br>YES                                                                            | EXPLAIN              | <u>NO</u><br>YES                                                                            |                                                                 |
| FLAG         | <u>I</u><br>C<br>E<br>W                                                                     | FLAG                 | <u>I</u><br>C<br>E<br>W                                                                     |                                                                 |
| IMSBMP       | <u>NONE</u> <sup>1</sup><br><i>imsid</i>                                                    | IMSBMP               | <i>imsid</i>                                                                                | <sup>1</sup> Keyword is not specified on subcommand invocation. |
| IMSMPP       | <u>NONE</u> <sup>1</sup><br><i>imsid</i>                                                    | IMSMPP               | <i>imsid</i>                                                                                | <sup>1</sup> Keyword is not specified on subcommand invocation. |
| ISOLATION    | <u>RR</u><br>RS<br>CS<br>UR                                                                 | ISOLATION            | <u>RR</u><br>RS<br>CS<br>UR                                                                 |                                                                 |
| KEEPDYNAMIC  | <u>NO</u><br>YES                                                                            | KEEPDYNAMIC          | <u>NO</u><br>YES                                                                            |                                                                 |
| NODEFER      | <u>NONE</u> <sup>1</sup><br>PREPARE                                                         | NODEFER              | <u>PREPARE</u>                                                                              | <sup>1</sup> Keyword is not specified on subcommand invocation. |

## DSNH (TSO CLIST)

Table 14 (Page 4 of 4). DSNH CLIST/ BIND PLAN Subcommand Summary

| DSNH CLIST |                                                                             | BIND PLAN subcommand             |                                                  | Comments                                                                                                                                                                                                                                                                                                   |
|------------|-----------------------------------------------------------------------------|----------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter  | Value                                                                       | Keyword                          | Value                                            |                                                                                                                                                                                                                                                                                                            |
| OWNER      | <u>NONE</u> <sup>1</sup><br><i>authorization-id</i>                         | OWNER                            | <i>authorization-id</i>                          | 1Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                        |
| PKLIST     | <u>NONE</u> <sup>1</sup><br><i>list of collection-ids and package-names</i> | PKLIST                           | <i>list of collection-ids and package- names</i> | 1 The package names are not specified on subcommand invocation.                                                                                                                                                                                                                                            |
| PLAN       | <i>plan-name</i> <sup>1</sup>                                               | PLAN<br><i>(primary-keyword)</i> | <i>plan-name</i>                                 | 1 <i>plan-name</i> must not be DEFAULT. The default <i>plan-name</i> is the first of the following available choices defined in the INPUT data set: <ul style="list-style-type: none"> <li>• DBRM member name</li> <li>• Leftmost qualifier.</li> </ul> <p>If no name is found, a plan is not created.</p> |
| QUALIFIER  | <u>NONE</u> <sup>1</sup><br><i>implicit-qualifier</i>                       | QUALIFIER                        | <i>qualifier-name</i>                            | 1Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                        |
| RELEASE    | <u>COMMIT</u><br><u>DEALLOCATE</u>                                          | RELEASE                          | <u>COMMIT</u><br><u>DEALLOCATE</u>               |                                                                                                                                                                                                                                                                                                            |
| REOPT      | <u>NONE</u> <sup>1</sup><br>VARS                                            | NOREOPT<br>REOPT                 | VARS<br>VARS                                     | 1Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                        |
| RETAIN     | <u>NO</u> <sup>1</sup><br><u>YES</u> <sup>2</sup>                           | RETAIN                           |                                                  | 1Keyword is not specified on subcommand invocation.<br><br>2 Keyword is specified on subcommand invocation.                                                                                                                                                                                                |
| SQLRULES   | <u>DB2</u><br><u>STD</u>                                                    | SQLRULES                         | <u>DB2</u><br><u>STD</u>                         |                                                                                                                                                                                                                                                                                                            |
| VALIDATE   | <u>RUN</u><br><u>BIND</u>                                                   | VALIDATE                         | <u>RUN</u><br><u>BIND</u>                        |                                                                                                                                                                                                                                                                                                            |

## DSNH CLIST/BIND PACKAGE Subcommand Comparison

Table 15 (Page 1 of 4). DSNH CLIST/ BIND PACKAGE Subcommand Summary

| DSNH CLIST |                                                    | BIND PACKAGE subcommand |                              | Comments                                                                            |
|------------|----------------------------------------------------|-------------------------|------------------------------|-------------------------------------------------------------------------------------|
| Parameter  | Value                                              | Keyword                 | Value                        |                                                                                     |
| PACTION    | <u>REPLACE</u><br><u>ADD</u>                       | ACTION                  | <u>REPLACE</u><br><u>ADD</u> |                                                                                     |
| PBIND      | <u>NO</u> <sup>1</sup><br><u>YES</u> <sup>2</sup>  | <i>(command-verb)</i>   |                              | 1 Do not execute BIND PACKAGE subcommand.<br><br>2 Execute BIND PACKAGE subcommand. |
| PCICS      | <u>NONE</u> <sup>1</sup><br><i>application-ids</i> | CICS                    | <i>application-ids</i>       | 1Keyword is not specified on subcommand invocation.                                 |

Table 15 (Page 2 of 4). DSNH CLIST/ BIND PACKAGE Subcommand Summary

| DSNH CLIST    |                                                                                                           | BIND PACKAGE subcommand |                                                                                                           | Comments                                                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter     | Value                                                                                                     | Keyword                 | Value                                                                                                     |                                                                                                                                                                                                                                                                                                                                        |
| COPY          | <u>NONE</u> <sup>1</sup><br><i>collection-id.</i><br><i>package-id</i>                                    | COPY                    | <i>collection-id.</i><br><i>package-id</i>                                                                | <sup>1</sup> Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                                        |
| COPYVER       | <i>version-id</i>                                                                                         | COPYVER                 | <i>version-id</i>                                                                                         |                                                                                                                                                                                                                                                                                                                                        |
| PCURRENTDATA  | NO<br>YES<br><u>NONE</u>                                                                                  | CURRENTDATA             | <u>YES</u><br>NO                                                                                          |                                                                                                                                                                                                                                                                                                                                        |
| PDBRMLIB      | <u>DEFAULT</u> <sup>1</sup><br><i>dsname(member)</i><br>NONE <sup>2</sup>                                 | LIBRARY                 | <i>dbrm-pds-name</i>                                                                                      | <sup>1</sup> The precompiler DBRMLIB data set is used. If the pre-compiler DBRMLIB is not specified, then the default-generated DBRMLIB library based upon the INPUT data set is used.<br><br><sup>2</sup> Keyword is not specified on subcommand invocation.                                                                          |
| PDEFER        | <u>NONE</u> <sup>1</sup><br>PREPARE                                                                       | DEFER                   | PREPARE                                                                                                   | <sup>1</sup> Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                                        |
| PDEGREE       | <u>1</u><br>ANY                                                                                           | DEGREE                  | <u>1</u><br>ANY                                                                                           |                                                                                                                                                                                                                                                                                                                                        |
| PDISABLE      | <u>NONE</u><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP<br><br>REMOTE<br>RRSAF | DISABLE                 | <u>NONE</u><br>BATCH<br>CICS<br>DB2CALL<br>IMS<br><br>DLIBATCH<br>IMSBMP<br>IMSMPP<br><br>REMOTE<br>RRSAF |                                                                                                                                                                                                                                                                                                                                        |
| PDLIBATCH     | <u>NONE</u> <sup>1</sup><br><i>list of</i><br><i>connection-ids</i>                                       | DLIBATCH                | <i>connection-name</i>                                                                                    | <sup>1</sup> Keyword is not specified on subcommand invocation.                                                                                                                                                                                                                                                                        |
| PDMEM         | <u>DEFAULT</u> <sup>1</sup><br><i>dbrm-member-name</i><br>NONE <sup>2</sup>                               | MEMBER                  | <i>dbrm-member-name</i>                                                                                   | <sup>1</sup> DBRM member name obtained from one of the following sources, in the order listed: <ul style="list-style-type: none"> <li>• PDBRMLIB member name</li> <li>• DBRMLIB member name</li> <li>• INPUT member name, or generated using <i>dsname</i>.</li> </ul> <sup>2</sup> Keyword is not specified on subcommand invocation. |
| PDYNAMICRULES | <u>NONE</u><br>RUN<br>BIND                                                                                | DYNAMICRULES            | <u>RUN</u><br>BIND                                                                                        |                                                                                                                                                                                                                                                                                                                                        |

## DSNH (TSO CLIST)

Table 15 (Page 3 of 4). DSNH CLIST/ BIND PACKAGE Subcommand Summary

| DSNH CLIST   |                                                                              | BIND PACKAGE subcommand |                                               | Comments                                                                                                                                            |
|--------------|------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter    | Value                                                                        | Keyword                 | Value                                         |                                                                                                                                                     |
| PENABLE      | <u>NONE</u><br>*                                                             | ENABLE                  | <u>NONE</u><br>*                              |                                                                                                                                                     |
|              | BATCH                                                                        |                         | BATCH                                         |                                                                                                                                                     |
|              | CICS                                                                         |                         | CICS                                          |                                                                                                                                                     |
|              | DB2CALL                                                                      |                         | DB2CALL                                       |                                                                                                                                                     |
|              | IMS                                                                          |                         | IMS                                           |                                                                                                                                                     |
|              | DLIBATCH                                                                     |                         | DLIBATCH                                      |                                                                                                                                                     |
|              | IMSBMP                                                                       |                         | IMSBMP                                        |                                                                                                                                                     |
|              | IMSMPP                                                                       |                         | IMSMPP                                        |                                                                                                                                                     |
|              | REMOTE                                                                       |                         | REMOTE                                        |                                                                                                                                                     |
|              | RRSAF                                                                        |                         | RRSAF                                         |                                                                                                                                                     |
| EXPLAIN      | <u>NO</u>                                                                    | EXPLAIN                 | <u>NO</u>                                     |                                                                                                                                                     |
|              | YES                                                                          |                         | YES                                           |                                                                                                                                                     |
| PFLAG        | <u>I</u>                                                                     | FLAG                    | <u>I</u>                                      |                                                                                                                                                     |
|              | C                                                                            |                         | C                                             |                                                                                                                                                     |
|              | E                                                                            |                         | E                                             |                                                                                                                                                     |
|              | W                                                                            |                         | W                                             |                                                                                                                                                     |
| PIMSBMP      | <u>NONE</u> <sup>1</sup><br><i>imsid</i>                                     | IMSBMP                  | <i>imsid</i>                                  | 1Keyword is not specified on subcommand invocation.                                                                                                 |
| PIMSMPP      | <u>NONE</u> <sup>1</sup><br><i>imsid</i>                                     | IMSMPP                  | <i>imsid</i>                                  | 1Keyword is not specified on subcommand invocation.                                                                                                 |
| PISOLATION   | <u>NONE</u> <sup>1</sup>                                                     | ISOLATION <sup>1</sup>  | RR                                            | 1 For local packages, the default value is the same as that of the plan appended at execution time. For remote packages, the default value is RR.   |
|              | RR                                                                           |                         | RS                                            |                                                                                                                                                     |
|              | RS                                                                           |                         | CS                                            |                                                                                                                                                     |
|              | CS                                                                           |                         | UR                                            |                                                                                                                                                     |
|              | UR                                                                           |                         | NC                                            |                                                                                                                                                     |
|              | NC                                                                           |                         |                                               |                                                                                                                                                     |
| PKEEPDYNAMIC | <u>NONE</u>                                                                  | KEEPDYNAMIC             | <u>NO</u>                                     |                                                                                                                                                     |
|              | NO                                                                           |                         | YES                                           |                                                                                                                                                     |
|              | YES                                                                          |                         |                                               |                                                                                                                                                     |
| PNODEFER     | <u>NONE</u> <sup>1</sup><br>PREPARE                                          | NODEFER                 | PREPARE                                       | 1Keyword is not specified on subcommand invocation.                                                                                                 |
| POWNER       | <u>NONE</u> <sup>1</sup><br><i>authorization-id</i>                          | OWNER                   | <i>authorization-id</i>                       | 1Keyword is not specified on subcommand invocation.                                                                                                 |
| PACKAGE      | <u>DEFAULT</u> <sup>1</sup><br><i>location-name.</i><br><i>collection-id</i> | PACKAGE                 | <i>location-name.</i><br><i>collection-id</i> | 1 Member name defined in the INPUT parameter data set, or the data set name if no member name was specified.                                        |
| PQUALIFIER   | <u>NONE</u> <sup>1</sup><br><i>implicit-qualifier</i>                        | QUALIFIER               | <i>qualifier-name</i>                         | 1Keyword is not specified on subcommand invocation.                                                                                                 |
| PRELEASE     | <u>NONE</u> <sup>1</sup>                                                     | RELEASE <sup>1</sup>    | COMMIT                                        | 1 For local packages, the default value is the same as that of the plan appended at execution time. For remote packages, the default value is NONE. |
|              | COMMIT                                                                       |                         | DEALLOCATE                                    |                                                                                                                                                     |
|              | DEALLOCATE                                                                   |                         |                                               |                                                                                                                                                     |

Table 15 (Page 4 of 4). DSNH CLIST/ BIND PACKAGE Subcommand Summary

| DSNH CLIST |                                                                         | BIND PACKAGE subcommand |                              | Comments                                                                  |
|------------|-------------------------------------------------------------------------|-------------------------|------------------------------|---------------------------------------------------------------------------|
| Parameter  | Value                                                                   | Keyword                 | Value                        |                                                                           |
| REOPT      | <u>NONE</u> <sup>1</sup><br>VARS                                        | NOREOPT<br>REOPT        | VARS<br>VARS                 | <sup>1</sup> Keyword is not specified on subcommand invocation.           |
| REMOTE     | <u>NONE</u> <sup>1</sup><br><i>location-name</i> ,<br>< <i>luname</i> > | REMOTE                  | <i>network-name</i>          | <sup>1</sup> Keyword is not specified on subcommand invocation.           |
| REPLVER    | <u>NONE</u> <sup>1</sup><br><i>version-id</i>                           | REPLVER                 | <i>version-id</i>            | <sup>1</sup> <i>version-id</i> is not specified on subcommand invocation. |
| SQLERROR   | <u>NOPACKAGE</u><br>CONTINUE                                            | SQLERROR                | <u>NOPACKAGE</u><br>CONTINUE |                                                                           |
| PVALIDATE  | <u>RUN</u><br>BIND                                                      | VALIDATE                | <u>RUN</u><br>BIND           |                                                                           |

## Usage Notes

**CICS Translator:** Do not use CICS translator options in the source language for assembler programs; pass the options to the translator with the CICSOPT option.

**COBOL Options:** The COBOL DYNAM option has several restrictions:

- You cannot use the option with CICS.
- You must use the VS COBOL II library or the Language Environment (Language Environment for MVS & VM) library.
- To use the option with TSO or batch, the SDSNLOAD library must precede the IMS RESLIB in the step library, job library, or link list concatenations.
- To use the option with IMS, the IMS RESLIB must precede DSNLOAD.

Several COBOL options require DD statements that are not provided by the DSNH CLIST, as shown in Table 16.

Table 16. COBOL Options That Require Additional DD Statements

| Option  | Statements Required For...                       |
|---------|--------------------------------------------------|
| CDECK   | SYSPUNCH                                         |
| COUNT   | SYSCOUNT, SYSDBG, SYSDBOUT, SYSUT5, a debug file |
| DECK    | SYSPUNCH                                         |
| DUMP    | SYSABEND, SYSDUMP, or SYSUDUMP                   |
| FDECK   | SYSPUNCH                                         |
| FLOW    | SYSCOUNT, SYSDBG, SYSDBOUT, SYSUT5, a debug file |
| LVL     | SYSUT6                                           |
| STATE   | SYSCOUNT, SYSDBG, SYSDBOUT, SYSUT5, a debug file |
| SYMDUMP | SYSCOUNT, SYSDBG, SYSDBOUT, SYSUT5, a debug file |
| SYST    | SYSOUT                                           |
| SYSx    | SYSOUx                                           |
| TEST    | SYSUT5                                           |

## DSNH (TSO CLIST)

**COBOL Parameters:** The BUF and SIZE parameters passed to the COBOL compiler might have to be changed.

**COPTION:** Do not use the COPTION parameter to specify values for the LINECOUNT, SOURCE, TERM, and XREF compiler options; use the DSNH LINECOUNT, SOURCE, TERM, and XREF keywords.

**FORTRAN and PL/I Considerations:** Variable-format input records are not supported.

**Library Limits:** There can be at most eight bind libraries, four precompile libraries, four compile libraries, and four link-edit libraries.

### Link-Edit:

- DSNH cannot process programs that need additional link-edit control statements, and cannot link-edit programs that use the call attachment facility.
- You cannot use the NOLOAD and SYNTAX link-edit options.

**NONE is a reserved word:** NONE cannot be the name of an input or a load library, or the value of the string passed with PARMS.

**SQL Host Variables:** SQL host variables must be explicitly defined.

**SYSPROC:** If compilation is done, the SYSPROC data set must include the DB2 CLIST library.

**WORKUNIT Parameter:** You must use the WORKUNIT parameter when running the DSNH CLIST in batch mode. This insures that the temporary and intermediate data sets are allocated to the correct devices.

## Examples

**Example 1:** Precompile, bind, compile, link-edit, and run the COBOL program in data set *prefix.SDSNSAMP(DSN8BC4)*.

- The compiler load module is in SYS1.LINKLIB (IKFCBL00).
- Additional load modules to be included are in *prefix.RUNLIB.LOAD* and *prefix.SDSNSAMP*.
- The load module is be put into the data set *prefix.RUNLIB.LOAD(DSN8BC4)*.
- The plan name is DSN8BC51 for the bind and run.
- DCLGEN data from *prefix.SRCLIB.DATA* is required for the precompile.

This example assumes that the DSNH CLIST is in your SYSPROC concatenation.

```
DSNH INPUT ('prefix.SDSNSAMP(DSN8BC4)') -
 COBLOAD ('SYS1.LINKLIB (IKFCBL00)') -
 LLIB ('prefix.RUNLIB.LOAD') -
 L2LIB ('prefix.SDSNSAMP') -
 LOAD ('prefix.RUNLIB.LOAD') -
 PLAN (DSN8BC51) -
 PLIB ('prefix.SRCLIB.DATA')
```

**Example 2:** Precompile, bind, compile, and link-edit the program in data set *prefix.SDSNSAMP.PLI(DSN8BP4)*.

- The program is written in PL/I; the macro pass is not needed.
- The PL/I compiler options MAP and LIST are to be used.

- Additional load modules to be included are in *prefix*.RUNLIB.LOAD and *prefix*.SDSNSAMP.
- The PL/I optimizing compiler load module is in library SYS2.LINKLIB(IELOAA).
- The DB2 subsystem identifier is SSTR.
- The load module is put into the data set *prefix*.RUNLIB.LOAD(DSN8BC4).
- Printed output is sent to the following data sets:
 

| <b>Output</b>        | <b>Data Set</b>              |
|----------------------|------------------------------|
| Precompiler listings | <i>prefix</i> .PROG.PCLIST   |
| Compiler listings    | <i>prefix</i> .PROG.LIST     |
| Link edit listings   | <i>prefix</i> .PROG.LINKLIST |
- The plan name is DSN8BC51 for the bind and run.
- The DCLGEN data from *prefix*.SRCLIB.DATA is required for the precompile.

```

DSNH INPUT('prefix.SDSNSAMP(DSN8BP4)') -
HOST(PLI) MACRO(NO) -
COPTION ('MAP LIST') -
LLIB('prefix.RUNLIB.LOAD') -
L2LIB('prefix.SDSNSAMP') -
PLILOAD('SYS2.LINKLIB(IELOAA)') -
SYSTEM(SSTR) -
LOAD('prefix.RUNLIB.LOAD') -
PRINT(PROG) -
PLAN(DSN8BC51) -
PLIB('prefix.SRCLIB.DATA')

```

The COPTION parameters are enclosed between single apostrophes so that they are passed by TSO as a single parameter. If a single token is being passed as a parameter, no apostrophes are needed. That same rule applies to the PARMs and CICSOPT parameters.

If a data set name is being passed as a parameter, and you want TSO to add your user prefix, no apostrophes are needed. If the usual TSO prefixing and suffixing must not be performed, the data set name must be enclosed between sets of three apostrophes if the CLIST is executed implicitly, and sets of six apostrophes if the CLIST is executed explicitly.

The user prefix for that example is *prefix*; if it had been SMITH, the listing data set names would be as shown above, except that SMITH would be used as the first level qualifier. For example, the compiler listings would have gone to SMITH.PROG.LIST.

**Example 3:** Invocation of the DB2-C sample application program *prefix*.SDSNSAMP(DSN8BD3).

- The C linkage editor include library is EDC.V1R1M1.SEDCBASE
- The C compiler load module is EDC.V1R1M1.SEDCCOMP(EDCCOMP)
- Printed output is sent to the following data sets:

| <b>Output</b>            | <b>Data Set</b>                      |
|--------------------------|--------------------------------------|
| Precompiler listings     | <i>user_id</i> .TEMP.PCLIST          |
| Compiler listings        | <i>user_id</i> .TEMP.SYSCPRT.LIST    |
| Prelink utility listings | <i>user_id</i> .TEMP.SYSOUT.PRELLIST |
| Link-edit listings       | <i>user_id</i> .TEMP.LINKLIST        |

- The following C DD names are allocated based on the PRINT keyword value:

## DSNH (TSO CLIST)

| DD Name | Allocation                |
|---------|---------------------------|
| SYSCPRT | Used in the compile step  |
| SYSUT10 | Used in the compile step  |
| SYSOUT  | Used in the prelink step. |

SYSUT10 and SYSCPRT are always allocated to the same data set or destination.

- SYSTEM is used in the compile step. It is based on the TERM keyword.
- CEEDUMP is used in the run step. It is based on the RUNOUT keyword.
- The LOPTION keyword values of AMODE(31) and RMODE(ANY) are required when link editing the C sample program to insure 31-bit addressability during execution.

```
ALLOC DD(SYSPROC) DSN('prefix.SDSNCLST ') SHR
%DSNH BIND(YES) ACQUIRE(USE) ACTION(REPLACE)-
EXPLAIN(NO) -
CICSXLAT(NO) -
COMPILE(YES) -
CCLLIB('EDC.V1R1M1.SEDCBASE')-
CCLOAD('EDC.V1R1M1.SEDCCOMP(EDCCOMP)')-
DBRM('prefix.DBRMLIB.DATA(DSN8BD3)')-
DECIMAL(PERIOD) DELIMIT(DEFAULT) FLAG(I)-
HOST(C) ISOLATION(RR)-
INPUT('prefix.SDSNSAMP(DSN8BD3)')-
LINK(YES)-
LLIB('prefix.RUNLIB.LOAD')-
L2LIB('prefix.SDSNLOAD')-
LOAD('prefix.RUNLIB.LOAD')-
LOPTION('AMODE(31) RMODE(ANY)')-
MACRO(NO)-
OUTNAME(TEMP)-
PLAN(DSN8BD31) PRECOMP(YES)-
PLIB('prefix.SDSNSAMP')-
PRELINK(NO)-
POPTION(NONE)-
PRINT(TEMP) RCTERM(8)-
RELEASE(COMMIT) RETAIN(YES)-
RUN(NO) RUNIN(TERM)-
RUNOUT(TERM) SOURCE(YES)-
SYSTEM(DSN) SQLDELIM(DEFAULT)-
VALIDATE(RUN)
```



---

## END (DSN)

The DSN subcommand END is used to end the DSN session and return to TSO.

## Environment


This subcommand originates from a TSO input stream when DSN is running in either background or foreground mode.

**Data Sharing Scope:** Member

## Authorization

None is required.

## Syntax



▶—END—▶

## Usage Note

**Ending the DSN Session in Batch or the Foreground:** In batch, if END is not found in the SYSIN stream, /\* or // ends the DSN session. From the foreground, pressing the ATTENTION key twice ends the DSN session.

## Example

**Example:** End the DSN session and return to TSO.

```
TSO prompt : READY
USER enters: DSN SYS (SSTR)
DSN prompt : DSN
USER enters: RUN PROGRAM (MYPROG)
DSN prompt : DSN
USER enters: END
TSO prompt : READY
```

## FREE PACKAGE (DSN)

---

## FREE PACKAGE (DSN)

The DSN subcommand FREE PACKAGE can be used to delete a specific version of a package, all versions of a package, or whole collections of packages.

The FREE PACKAGE subcommand deletes corresponding table entries from the catalog tables. Authorization for a package name is only removed when no more versions of the package exist. After a version of a package has been freed, that package name is then available for use in a BIND PACKAGE subcommand to create a new package.

The FREE PACKAGE subcommand does not proceed until all currently executing applications using the package finish executing.

For additional information about packages, see Section 5 of *Application Programming and SQL Guide*.

## Environment

You can enter this subcommand from DB2I, or from a DSN session under TSO that is running in either foreground or background.

**Data Sharing Scope:** Group

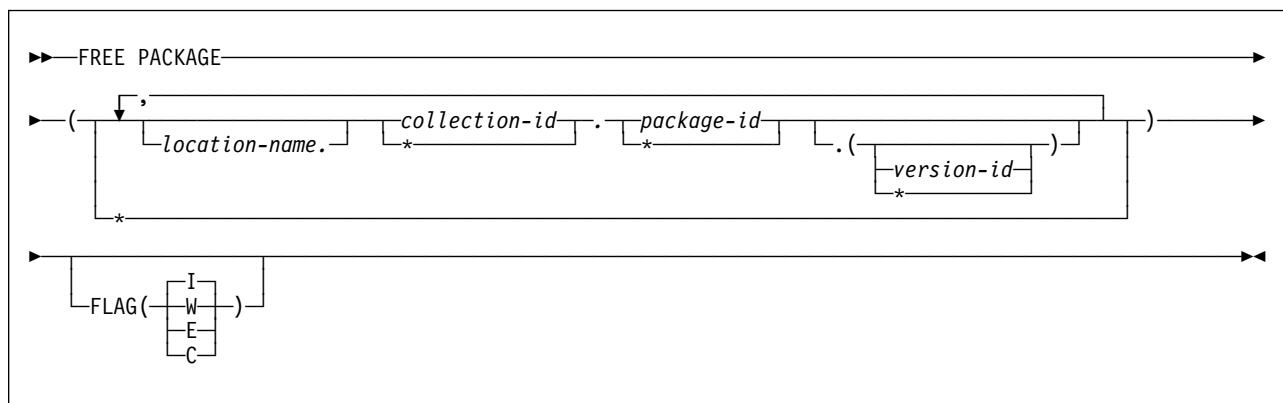
## Authorization

To execute this subcommand, the privilege set of the process must include one of the following:

- Ownership of the package
- BINDAGENT privilege granted by the owner of the package
- SYSCTRL or SYSADM authority
- PACKADM authority for the collection or for all collections

The BIND privilege on a package is *not* sufficient to allow a user to free a package.

## Syntax



## Option Descriptions

### *location-name*

Specifies the location of the DBMS where the package is to be freed. The location name must be defined in the SYSIBM.LOCATIONS table. If this table does not exist or the DBMS is not found, you receive an error message. If the location name is specified, the name of the local DB2 must be defined. See Section 3 of *Installation Guide* for information on how to define a location name within SYSIBM.LOCATIONS.

The **default** is the local DB2 if you omit *location-name*.

### *collection-id* or \*

Identifies the collection of the package to be freed. There is no default.

You can use an asterisk (\*) to free all local packages with the specified *package-id* in all the collections that you are authorized to free. (You cannot use the \* to free remote packages.)

### *package-id* or \*

Identifies the package to be freed. There is no default.

You can use an asterisk (\*) to free all local packages in *collection-id* that you are authorized to free. (You cannot use the \* to free remote packages.)

### (*version-id*) or (\*)

Identifies the version of the package to be freed.

You can use an asterisk (\*) to free all local packages in the *collection-id* and *package-id* that you are authorized to free. (You cannot use the \* to free remote packages.)

If you specify () for *version-id*, then the empty string is used for the version ID.

If you omit the *version-id*, the default depends on how you specify *package-id*. If you use \* for *package-id*, *version-id* defaults to \*. If you provide an explicit value for *package-id*, *version-id* defaults to an empty string.

DBRMs created before DB2 Version 2 Release 3 use an empty string for *version-id* by default.

(\*) Frees all local DB2 packages that you are authorized to free.

Specifying (\*) is equivalent to specifying the package name as (\*.\*(\*)) or (\*.\*)).

## FLAG

Tells what messages you want to see. Use one of the values listed to show messages of the corresponding types.

**(I)** All: informational, warning, error, and completion messages.

The **default** is **FLAG**.

**(W)** Only warning, error, and completion messages.

**(E)** Only error and completion messages.

**(C)** Only completion messages.

## FREE PACKAGE (DSN)

### Usage Notes

**Freeing Multiple Packages:** If you free multiple packages with this subcommand, each successful free is committed before freeing the next package.

If an error occurs on a certain package specified explicitly in a list or implicitly with (\*), FREE PACKAGE terminates for that package and continues with the next package to be processed.

### Examples

**Example 1:** Free version *newver* of the package TEST.DSN8BC51 located at USIBMSTODB22. Generate only warning, error, and completion messages (not informational messages).

```
FREE PACKAGE (USIBMSTODB22.TEST.DSN8BC51.(newver)) FLAG(W)
```

**Example 2:** Free all packages at the local server in the collection named TESTCOLLECTION.

```
FREE PACKAGE (TESTCOLLECTION.*)
```

## FREE PLAN (DSN)

The DSN subcommand FREE PLAN deletes application plans from DB2.

The FREE PLAN subcommand deletes corresponding table entries from the SYSIBM.SYSPLAN catalog tables. All authorization against an application plan name is dropped. The application plan name is then available for use in a BIND PLAN subcommand to create a new package.

The FREE PLAN subcommand does not proceed until all currently executing applications using that plan finish executing.

For additional information on plans, see Section 5 of *Application Programming and SQL Guide*.

## Environment

You can enter this subcommand from DB2I, or from a DSN session under TSO that is running in either foreground or background.

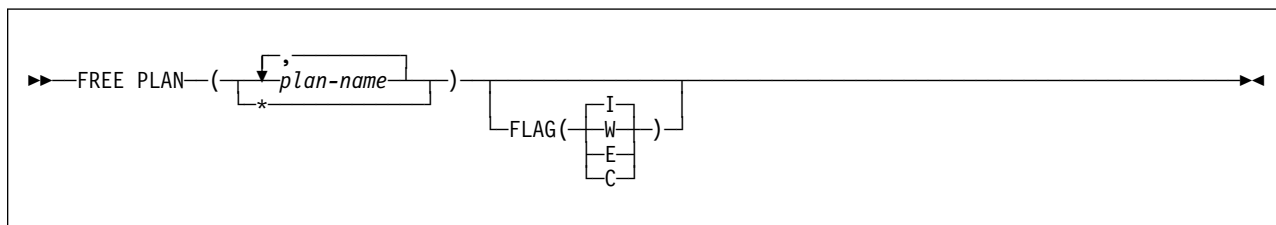
**Data Sharing Scope:** Group

## Authorization

To execute this command, the privilege set of the process must include one of the following:

- Ownership of the plan
- BIND privilege on the plan
- BINDAGENT privilege granted by the plan owner
- SYSCTRL or SYSADM authority

## Syntax



## Option Descriptions

*(plan-name, ...)*

Lists the names of one or more plans you want to free.

(\*) Frees *all* application plans over which you have BIND authority. Be careful when using this form of the command.

### FLAG

Tells what messages you want to see. Use one of the values listed to show messages of the corresponding types.

## FREE PLAN (DSN)

- (I) All: informational, warning, error, and completion messages.  
The **default** is **FLAG**.
- (W) Only warning, error, and completion messages.
- (E) Only error and completion messages.
- (C) Only completion messages.

## Usage Notes

**Freeing Multiple Plans:** If you free multiple plans with this subcommand, each successful free is committed before freeing the next plan.

If an error occurs on a certain plan specified explicitly in a list or implicitly with (\*), FREE PLAN terminates for that plan and continues with the next plan to be processed.

## Example

**Example:** Free plan DSN8BC51 from DB2. Generate only warning, error, and completion messages (not informational messages).

```
FREE PLAN (DSN8BC51) -
 FLAG (W)
```

## MODIFY irlmproc,ABEND (MVS IRLM)

The MODIFY *irlmproc*,ABEND command terminates the IRLM abnormally. IRLM processes this command even if there is a DB2 identified to it.

**Abbreviation:** F

### Environment

This command can be issued only from an MVS console.

**Data Sharing Scope:** Member

### Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

### Syntax

```
►—MODIFY—irlmproc,ABEND—,NODUMP—◄
```

### Option Descriptions

Parameters must be separated by commas with no spaces.

*irlmproc*

Identifies the procedure name of the IRLM that is to be terminated.

**NODUMP**

Specifies that IRLM is to terminate without generating a dump. Dump is the default. A system dump is taken to the SYS1.DUMPXX data set. If no dump is wanted, you must specify ABEND,NODUMP.

### Usage Notes

**Terminating the *irlmproc*:** If there are any difficulties terminating IRLM, see “Usage Note” on page 288

**Deregistering IRLM:** You can use the NODUMP option to deregister IRLM before stopping it. This action prevents the automatic restart manager from immediately trying to restart IRLM.

### Example

**Example:** Enter on an MVS system console:

```
F KRLM001,ABEND
```

Response on the MVS system console:

## MODIFY ...,ABEND (MVS IRLM)

```
DXR124E IR21001 ABENDED VIA MODIFY COMMAND
*IEA911E COMPLETE DUMP ON SYS1.DUMP00
FOR ASID(0004)
ERROR ID = SEQ00001 CPU00 ASID0004 TIME08.34.59.9
DXR121I IR21001 END-OF-TASK CLEANUP SUCCESSFUL
IEF450I IR210 IR21001 - ABEND=S000 U2020 REASON=00000000
```

```
| The default is dump. If the user does not want a dump, they must specify:
| F KRLM001,ABEND,NODUMP
```



## MODIFY irlmproc,DIAG,DELAY (MVS IRLM)

The MODIFY *irlmproc*,DIAG,DELAY command initiates diagnostic dumps for IRLM subsystems in a data sharing group when responses to XES requests take longer than 45 seconds.

If IRLM detects a delay in the child-lock propagation process, it retries the XES calls in order to recover. Use the MODIFY *irlmproc*,DIAG,DELAY command under the direction of IBM Service if this situation occurs.

**Abbreviation:** F

### Environment

This command can be issued only from an MVS console.

**Data Sharing Scope:** Group

### Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

### Syntax

```
►►—MODIFY—irlmproc,DIAG,DELAY—◄◄
```

### Option Descriptions

Parameters must be separated by commas with no spaces.

*irlmproc*

Identifies the procedure name of the IRLM instance that is to be diagnosed.

**DIAG**

Indicates that this is a diagnostic dump.

**DELAY**

Directs IRLM to generate a dump the first time it detects that child lock propagation to the coupling facility is taking longer than 45 seconds. The dump is placed in the SYS1.DUMPxx data set.

### Usage Note

**Restrictions on Usage:** This command is active for only one incident per IRLM, that is, after an IRLM instance detects the delay and takes the dump. You can take one dump per IRLM in the group. You must reenter the command to initiate another dump. Be aware that when you enter this command for one member of the data sharing group, *any* member that detects the delay will initiate a dump.

The *irlmproc* identifies the procedure name for IRLM. If multiple IRLM instances exist in the same system, each procedure must have a unique procedure name.

## MODIFY ...,DIAG,DELAY (MVS IRLM)

### Example

*Example 1:* Issue this command to initiate one diagnostic dump for the IR21PROC IRLM subsystem. The dump will occur once, after the propagation of child locks takes longer than 45 seconds.

```
MODIFY IR21PROC,DIAG,DELAY
```

## MODIFY irlmproc,SET (MVS IRLM)

The MODIFY irlmproc,SET command performs the following tasks:

- Dynamically sets the maximum CSA allowed for IRLM.
- Dynamically sets the number of trace buffers allowed for IRLM.

**Abbreviation:** F

## Environment

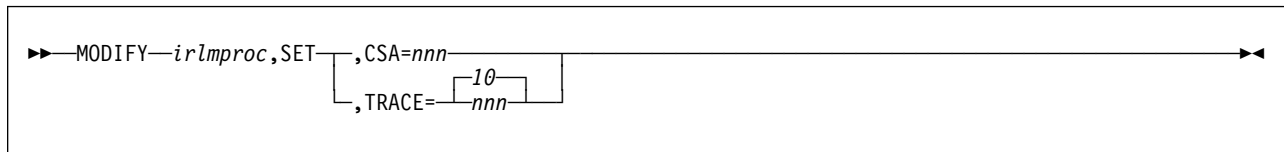
This command can be issued only from an MVS console.

**Data Sharing Scope:** Member

## Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

## Syntax



## Option Descriptions

Use commas with no spaces to separate parameters.

*irlmproc*

Specifies the IRLM that is to process the command.

**SET**

Use this keyword to set the maximum amount of CSA storage or the number of trace buffers used for this IRLM.

**CSA=nnn**

Requests that IRLM dynamically set the maximum amount of common storage area (CSA) for this IRLM to use for lock control structures. *nnn* must be a 1- to 3-digit number from 1 through 999. The number indicates what multiple of 1MB of storage the specified IRLM will use. For example, CSA=6 allows the IRLM to use 6MB of CSA.

The lock control structures are allocated from extended common storage area (ECSA) when PC=NO, or from IRLM private region when PC=YES.

IRLM does not immediately allocate CSA storage for the new value you set using this command; IRLM allocates storage as needed, not to exceed the amount of CSA specified. If the amount of storage currently allocated by IRLM is greater than the amount of CSA you specify using this command, IRLM does not obtain more storage until normal proc-

## MODIFY ...,SET (MVS IRLM)

essing frees enough storage to bring the current allocation below the new CSA value you set.

### **TRACE=nnn**

Requests that IRLM dynamically set the maximum number of 64KB trace buffers per trace type to the value you specify in *nnn*. *nnn* must be a number from 10 through 255. If you specify a value outside of this range, IRLM automatically adjusts the value to a value within the range.

The **default** is **10**.

This value is used only when the external CTRACE writer is not activated. The trace buffers are allocated from extended common storage area (ECSA).

IRLM does not immediately acquire the number of trace buffers you set using this command; IRLM allocates buffers as needed, not to exceed the number of buffers you specified. If the number of trace buffers you set is less than the number of currently allocated buffers, IRLM brings the number within your specified range by releasing the oldest buffers at the end of the next deadlock or timeout cycle.

## Usage Notes

**Determining Limits for CSA Values:** Do not modify the CSA value without first contacting the system programmer to determine the amount of CSA storage that can be used for IRLM.

**Effect of an IRLM Restart:** The values you set using the MODIFY irImproc,SET command do not persist through a stop and restart of IRLM. The number of trace buffers for each trace type returns to the default value of 10, and the value for MAXCSA returns to the value you set for the MAXCSA parameter on the IRLM startup procedure.

## Examples

**Example 1:** Enter on an MVS system console:

```
F IR21PROC,SET,CSA=10
```

Response on the MVS system console:

```
DXR178I IR21033 MAXIMUM CSA IS SET TO 10MB
```

*Explanation:* IR21033 is the IRLM subsystem name concatenated with the IRLM system ID.

**Example 2:** Enter on an MVS system console:

```
F IR21PROC,SET,TRACE=20
```

Response on the MVS system console:

```
DXR177I IR21033 THE MAXIMUM NUMBER OF TRACE BUFFERS
FOR EACH TRACE TYPE IS SET TO 20
```

## MODIFY irlmproc,STATUS (MVS IRLM)

This command displays information for one or more subsystems connected to the specified IRLM designated using *irlmproc*. Each subsystem connected to the specified IRLM is listed, including subsystem name, status, work unit and lock information. Additionally, you can list an IRLM's ID and service level. For a specified IRLM, you can display the current storage allocated, as well as the greatest amount of storage that has been allocated since the last time this IRLM was started.

**Abbreviation:** F

### Environment

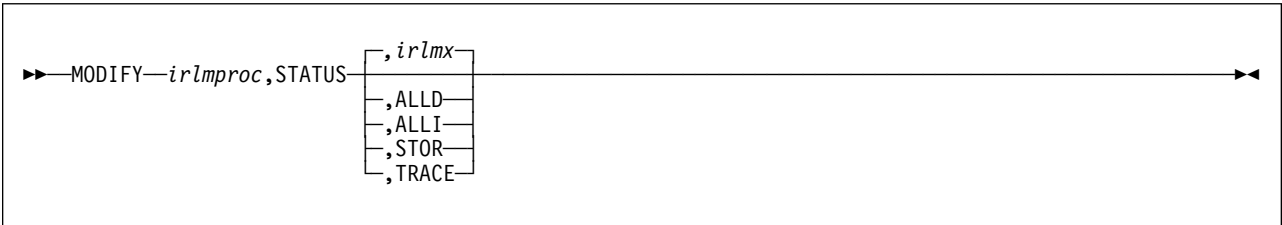
This command can be issued only from an MVS console.

**Data Sharing Scope:** Member or group, depending on which option you choose

### Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

### Syntax



### Option Descriptions

*irlmproc*  
Specifies the IRLM that is to process the command.

*irlmx*  
Specifies which IRLM's status is to be displayed. *irlmx* is the concatenation of the IRLM subsystem name and IRLM member ID as specified in the IRLM startup procedure (DB2 installation panel DSNTIPI). An example is DB2G2 (ID is 2).

**ALLD**  
Requests the DB2 subsystem name and status of a DB2 that is identified to an IRLM. In the data sharing group, this command lists information about all DB2s that are currently identified to an IRLM, assuming that the IRLM on which the command is issued is connected to the data sharing group. You can determine if the IRLM is connected by issuing a MODIFY irlmproc,STATUS command and checking that the output shows SCOPE=GLOBAL.

If a DB2 is down and holds retained locks, that DB2 is also displayed. However, the IRLM that is displayed with that DB2 can vary depending on several circumstances:

- Normally, it is the last IRLM to which DB2 identified.

## MODIFY ...,STATUS (MVS IRLM)

- If there was a rebuild of the lock structure after the retained locks were created, it is the IRLM with the lowest member ID at the time the rebuild occurred.
- If a group restart is occurring and one DB2 is recovering on behalf of another DB2, the IRLM that is displayed is the one associated with the DB2 doing the peer recovery. For example, if DB2A is doing a peer recovery of DB2B, the display might show:

| NAME | STATUS | ... | IRLM_NAME |
|------|--------|-----|-----------|
| DB2A | UP     |     | IRLA      |
| DB2B | DOWN   |     | IRLA      |

### ALLI

Requests the IRLM subsystem name, ID, status, and service level. In a data sharing group, this command lists information about all IRLMs in the data sharing group, assuming that the IRLM on which the command is issued is connected to the data sharing group. You can determine if the IRLM is connected by issuing a `MODIFY irlmproc,STATUS` command and checking that the output shows `SCOPE=GLOBAL`.

If an IRLM is down, it is displayed only if its associated DB2 is down and holds retained locks. The IRLM that is displayed can vary depending on several circumstances:

- Normally, it is the last IRLM to which DB2 identified.
- If there was a rebuild of the lock structure after the retained locks were created, it is the IRLM with the lowest member ID at the time the rebuild occurred.
- If the failed DB2 had recovery done on its behalf by another DB2, the IRLM that is displayed is the one associated with the DB2 that did the peer recovery.

### STOR

For this IRLM only, displays the current and "high water" allocation for CSA and ECSA storage.

### TRACE

Requests information about IRLM subcomponent trace types. Information includes whether a subcomponent trace type is active, how many trace buffers are used by the trace, and whether the component trace external writer is active for the trace.

## Usage Notes

**Messages:** If *irlmx* is not specified, or if this IRLM is in a non-data-sharing environment, message DXR1011 is issued. That message lists each subsystem connected to the IRLM specified by *irlmx*, with an indication as to whether the connection is active.

**Displaying IRLM IDs:** If *irlmproc* is started specifying `SCOPE=GLOBAL`, the second line of the display indicates the IRLM IDs of the IRLMs.

## Examples

**Example 1:** Enter on the MVS1 system console:

```
F IRTPROC,STATUS
```

Response on MVS1 system console:

```
DXR101I IR2T STATUS SCOPE=LOCAL
 SUBSYSTEMS IDENTIFIED PT01
 NAME STATUS UNITS HELD WAITING RET_LKS
 DSNT1 UP-NS 0005 0010 0002 0
```

*Explanation:* The operator on system 1 has requested information about the DB2 systems connected to the IRLM identified by the IRLM procedure named IRTPROC.

If the IRLM is SCOPE=GLOBAL on the irlmproc and is not connected to any group, the status message shows:

```
DXR101I IR21 STATUS SCOPE=DISCON
```

**Example 2:** Assume you have a data sharing group. Enter on a system console:

```
F DB1GIRLM,STATUS,ALLD
```

Response on system console:

```
14.02.10 STC00086 DXR102I DJ1G STATUS IRLMID=001
 SUBSYSTEMS IDENTIFIED PT01
 NAME STATUS RET_LKS IRLMID IRLM_NAME
 DB4G UP 0 004 DJ4G
 DB3G UP 0 003 DJ3G
 DB2G UP 0 002 DJ2G
 DB1G UP 0 001 DJ1G
```

*Explanation:* The output shows all the DB2s that are connected to IRLMs in this data sharing group (the group to which the IRLM processing the request belongs). The value "UP" in the STATUS field indicates that the DB2 is active. Other possible values for STATUS include:

DOWN            The DB2 is failed.

SYSFAIL        The IRLM that DB2 is identified to has been disconnected from the data sharing group. Any "modify" type locks held by DB2 have been retained by IRLM.

**Example 3:** Again, assume data sharing is in effect. Enter the following on the system console:

```
F DB1GIRLM,STATUS,ALLI
```

The response on the console is:

```
17.17.03 STC00092 DXR103I LRLM STATUS IRLMID=007
 IRLMS PARTICIPATING IN DATA SHARING GROUP FUNCTION LEVEL=006
 IRLM_NAME IRLMID STATUS LEVEL SERVICE MIN_LEVEL MIN_SERVICE
 JRLM 005 UP 013 PN92893 006 IRLM2.1
 KRLM 006 UP 006 IRLM2.1 006 IRLM2.1
 LRLM 007 UP 013 PN92893 006 IRLM2.1
```

## MODIFY ...,STATUS (MVS IRLM)

*Explanation:* The output shows the IRLMs that are participating in this data sharing group (the group which includes the IRLM processing the request). Other information includes:

- STATUS** The value "UP" in the STATUS field indicates that the IRLM is active. STATUS shows "DOWN" if the IRLM is failed.
- LEVEL** The current IRLM function level.
- SERVICE** The IRLM service or release that corresponds to the function level given in "LEVEL".
- MIN\_LEVEL** The minimum IRLM function level this IRLM can coexist with.
- MIN\_SERVICE** The IRLM service or release that corresponds to the function level given in "MIN-LEVEL".
- Group Function Level** The IRLM function level in use by all the IRLMs in the data sharing group.

**Example 4:** Assume that this command is issued in a non-data sharing environment. Enter the following on the system console:

```
F DB1GIRLM,STATUS,ALLI
```

The response on the console is:

```
15.12.01 STC00092 DXR103I VRLM STATUS IRLMID=007
 IRLMS PARTICIPATING IN DATA SHARING GROUP FUNCTION LEVEL=016
 IRLM_NAME IRLMID STATUS LEVEL SERVICE MIN_LEVEL MIN_SERVICE
 VRLM 007 UP 016 PQ15854 012 PN90337
```

*Explanation:* The output shows information only for the IRLM specified. The group function level shown is the function level for the specified IRLM. Refer to Example 3 on page 217 for additional information on interpreting output.

**Example 5:** Enter the following command on the system console:

```
F IR21PROC,STATUS,STOR
```

The response on the console is:

```
DXR1001 IR21 STOR STATS
 PC: NO MAXCSA: 6M
 CSA USE: ACNT: 132K AHWM: 132K CUR: 4048K HWM: 4086K
 ABOVE 16M: 72 4033K BELOW 16M: 6 15K
 CLASS TYPE SEGS MEM TYPE SEGS MEM TYPE SEGS MEM
 ACCNT T-1 1 64K T-2 1 64K T-3 1 4K
 PROC WRK 11 58K SRB 3 3K OTH 2 2K
 MISC VAR 60 4081K N-V 6 22K FIX 1 24K
```

*Explanation:* The example shows that current storage allocated for IRLM is 4048 KB, and the greatest amount that has been allocated since the last time IRLM was started is 4086KB. The storage for the locking structures (RHB and RLB) is contained within ECSA, because this IRLM is defined with PC=NO. Use the following information to interpret the display output:

- PC** Displays the current value for the PC option of the IRLM startup procedure.



- MAXCSA** Displays the current value for the MAXCSA option of the IRLM startup procedure. The MAXCSA value is 6MB in this example.
- CSA USE** Shows storage use that is accountable toward the MAXCSA value of the IRLM procedure. In this output, the current use accountable storage (ACNT) is 132KB. The high water mark since the last time IRLM was started (AHWM) is also 132KB.
- CUR** Shows the total current CSA and ECSA usage. In this case, the current usage (CUR) is 4048KB, and the high water mark (HWM) is 4086KB. The accountable storage is a subset of this total storage.
- ACCNT** The ACCNT row of the report is a breakdown of lock control block structures and their storage use.
  - T-1** Type one structures are for resources. In this case, it shows that one storage segment is held for a total of 64KB.
  - T-2** Type two structures are for all resource requests after the first request for a specific resource. This example shows that one storage segment is held for a total of 64KB.
  - T-3** Type three structures are for requesters or work units that are waiting for or hold resources. This example shows that one storage segment is held for a total of 4KB.
- PROC and MISC rows** These rows contain usage information for CSA, ECSA, and private storage used to process DBMS requests. Use this information under the guidance of IBM service for diagnosing problems.

For more information, see the explanation of message DXR100I in *Messages and Codes*.

**Example 6:** Assume the IRLM was started with PC=YES. Enter the following command on the system console:

```
F IR21PROC,STATUS,STOR
```

The response on the console is:

```
DXR1001 JR21 STOR STATS
 PC: YES MAXCSA: N/A
CSA USE: ACNT: OK AHWM: OK CUR: 4362K HWM: 5830K
 ABOVE 16M: 78 4376K BELOW 16M: 23 32K
CLASS TYPE SEGS MEM TYPE SEGS MEM TYPE SEGS MEM
ACCNT T-1 1 64K T-2 1 64K T-3 1 4K
PROC WRK 11 58K SRB 20 20K OTH 2 2K
MISC VAR 68 4497K N-V 6 22K FIX 1 24K
```

*Explanation:* Because this IRLM was started with PC=YES, the storage used shown for accountable storage is that of the IRLM private storage used for the IRLM lock control structures. This example illustrates what can happen when an application

## MODIFY ...,STATUS (MVS IRLM)

generates a high IRLM lock contention rate. Notice the high value of 20 segments with 20KB each for SRB storage, and the high value of 23 segments with 23KB each for storage below the 16MB line.

For more information about reducing lock contention, see Section 5 (Volume 2) of *Administration Guide*. For more information about tuning your system, see Chapter 7 of *Data Sharing: Planning and Administration*.

**Example 7:** Enter the following command on the system console:

```
F PR21PROC,STATUS,TRACE
```

The response on the console is:

```
DXR179I PR21034 TRACE USAGE
TRACE BUFFER STORAGE IN USE: 256KB
MAXIMUM NUMBER OF TRACE BUFFERS ALLOWED PER TRACE TYPE: 10
TRACE TYPE ACTIVE BUFFERS IN USE CTRACE WRITER

SLM N 0 N
XIT Y 2 N
XCF N 0 N
DBM N 0 N
EXP Y 1 N
INT Y 1 N
```

*Explanation:* This example shows that the storage currently allocated for IRLM tracing is 256KB, the maximum number of trace buffers allowed per trace type is set to 10, and the external CTRACE writer is not active. For more information about the trace types, see "TRACE CT (MVS IRLM)" on page 304.

Use the TRACE CT command of MVS on page 304 to activate or deactivate traces. You cannot turn off the EXP and INT traces. The XIT (for data sharing), EXP, and INT traces are automatically activated when you start IRLM. All traces are automatically activated with IRLMPROC TRACE=YES.

The trace size for each buffer is 64KB. Use the MODIFY irlmproc,SET,TRACE=nnn command on page 213 to change the maximum number of trace buffers.

## -MODIFY TRACE (DB2)

The DB2 command MODIFY TRACE does the following:

- Changes the trace events (IFCIDs) being traced for a particular active trace.
- Stops any IFCID previously active for the specified trace.
- Writes statistics records.

**Abbreviation:** -MOD TRA

## Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

Traces started by a IFI/IFC program:

Before you modify an active trace, ensure that an IFI application program or the IFC Selective Dump utility (DSN1SDMP) did not start the trace. If you modify a trace started by DSN1SDMP, the DSN1SDMP utility abnormally terminates. When DSN1SDMP terminates, it stops the trace. This stop could interfere with the MODIFY TRACE command which stops and restarts the trace.

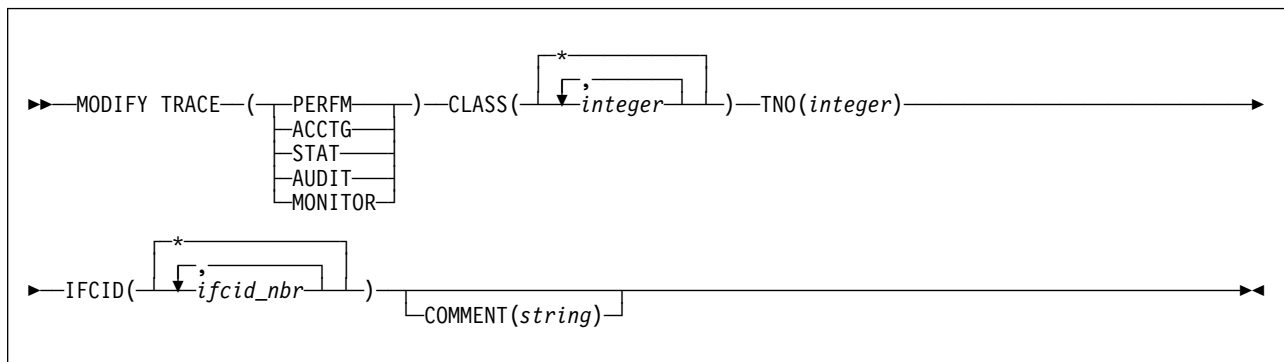
## Authorization

To execute this command, the privilege set of the process must include one of the following:

- TRACE privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

### **TRACE**

The trace type you specify determines which IFCIDs are started. For further descriptions of each trace type, see “-START TRACE (DB2)” on page 268.

*Table 17. Trace Types*

| Type    | Description                             | Abbreviation |
|---------|-----------------------------------------|--------------|
| PERFM   | Performance records of specific events  | P            |
| ACCTG   | Accounting records for each transaction | A            |
| STAT    | Statistical data                        | S            |
| AUDIT   | Audit data                              | AU           |
| MONITOR | Monitor data                            | MON          |

There is an additional trace type that is not described here. It is intended for service and use under the direction of IBM support personnel. For details, see *Diagnosis Guide and Reference*.

### **CLASS(integer, ...)**

Limits the list to IFCIDs started for specified classes.

**Abbreviation:** C

*integer* is a class to which the list of IFCIDs started is limited. For descriptions of the allowable classes, see “-START TRACE (DB2)” on page 268.

The **default** is **CLASS(\*)**, which starts all default IFCID classes.

### **TNO(integer)**

Specifies the particular trace to be modified, identified by its trace number (1 to 32, 01 to 09). You can only specify one trace number. TNO is a required option for the MODIFY TRACE command.

**No default** exists for the TNO keyword.

### **IFCID(ifcid\_nbr, ...)**

Specifies which other IFCIDs (trace events), in addition to those IFCIDs contained in the classes specified in the CLASS option, are to be started. To start only those IFCIDs specified in the IFCID option, use trace classes 30-32. These classes have no predefined IFCIDs and are available for a location to use. (See Example on page 223 for an example of activating only those trace events specified in the IFCID option.)

If you do not specify the IFCID option, only those IFCIDs contained in the activated trace classes are started.

The maximum number of IFCIDs is 156. The range of values that are valid for the IFCID option is 1 through 350, with the exception of: 4, 5, 185, 187, 217, 232, 234, 240, and 241.

The **default** is **IFCID(\*)**.

### **COMMENT(string)**

Gives a comment that is reproduced in the trace output record (except in the resident trace tables).

*string* is any character string; it must be enclosed between apostrophes if it includes a blank, comma, or special character.

## **Example**

**Example:** Change trace number 6 so that it collects only statistics and accounting data. You can define CLASS(30) at your site.

```
-MODIFY TRACE(S) IFCID(1,2,3) TNO(6) CLASS(30)
 COMMENT ('STATS AND ACCOUNTING ON')
```

---

### REBIND PACKAGE (DSN)

The DSN subcommand REBIND PACKAGE rebinds an application package when you make changes that affect the package, but have not changed the SQL statements in the program. For example, you can use REBIND PACKAGE when you change the authorizations, create a new index for the package, or use RUNSTATS.

REBIND PACKAGE is generally faster and more economical than BIND PACKAGE. You should use BIND PACKAGE with the ACTION(REPLACE) option under the following conditions:

- When you change the SQL statements
- When you recompile the program
- You previously ran BIND PACKAGE with the SQLERROR(CONTINUE) option

For more information on using REBIND PACKAGE, see Section 5 of *Application Programming and SQL Guide*.

### Environment

You can use REBIND PACKAGE through DB2I, or enter the REBIND PACKAGE subcommand from a DSN session running in foreground or background.

**Data Sharing Scope:** Group

### Authorization

The package owner must have authorization to execute *all* SQL statements embedded in the package for REBIND PACKAGE to build a package without producing error messages. For VALIDATE(BIND), DB2 verifies the authorization at bind time. For VALIDATE(RUN), DB2 verifies the authorization initially at bind time, but if the authorization check fails, DB2 rechecks it at run time.

Table 18 explains the authorization required to run REBIND PACKAGE, depending on the options specified.

*Table 18 (Page 1 of 2). Summary of Privileges for REBIND PACKAGE*

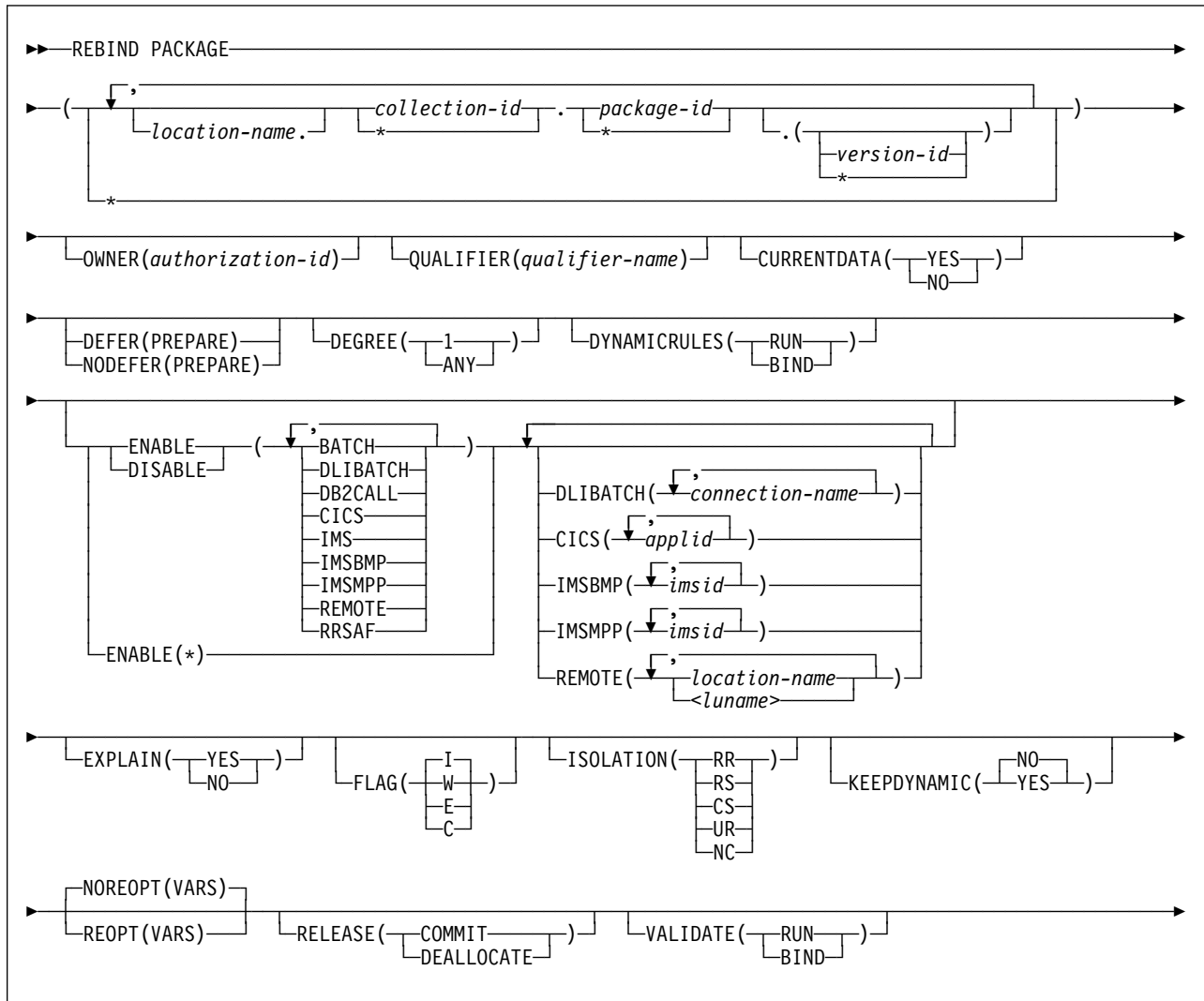
| Option                                                                                                      | Authorization Required to Run REBIND PACKAGE                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REBIND PACKAGE with no change in ownership, because the OWNER keyword is not specified.                     | The authorization IDs of the process must have one of the following: <ul style="list-style-type: none"><li>• Ownership of the package</li><li>• BIND privilege on the package</li><li>• BINDAGENT privilege from the owner of the package</li><li>• PACKADM authority on the collection or on all collections</li><li>• SYSADM or SYSCTRL authority</li></ul> |
| REBIND PACKAGE with no change in ownership, although the original owner is specified for the OWNER keyword. | The authorization IDs of the process must have one of the following: <ul style="list-style-type: none"><li>• OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder</li><li>• BINDAGENT privilege from the owner of the package</li><li>• SYSADM or SYSCTRL authority</li></ul>                                |

Table 18 (Page 2 of 2). Summary of Privileges for REBIND PACKAGE

| Option                                                                                                                           | Authorization Required to Run REBIND PACKAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REBIND PACKAGE with change of ownership. (An authorization ID that is not the original owner is specified in the OWNER keyword.) | <p>The new OWNER must have one of the following:</p> <ul style="list-style-type: none"> <li>• BIND privilege on the package</li> <li>• PACKADM authority on the collection or on all collections</li> <li>• SYSADM or SYSCTRL authority</li> </ul> <p><b>Specifying the OWNER:</b> If any of the authorization IDs have the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder.</p> |

For additional information on the authorization required to execute BIND PLAN see Section 5 (Volume 2) of *Administration Guide*.

## Syntax



## REBIND PACKAGE (DSN)

### Option Descriptions

For descriptions of the options shown in the syntax diagram, see “Options of BIND and REBIND for PLAN and PACKAGE” on page 56.

### Usage Notes

If you rebind multiple packages, DB2 commits each successful rebind before rebinding the next package.

### Example

**Example:** Rebind packages TEST.DSN8BC51.(MAY\_VERSION) and PRODUCTION.DSN8BC51.(DEC\_VERSION), both located at the local location USIBMSTODB22. The packages can run only from the CICS or the DLIBATCH environments if the connection ID is CON2. This replaces the CON1 specified on the BIND PACKAGE command.

```
REBIND PACKAGE (USIBMSTODB22.TEST.DSN8BC51.(MAY_VERSION),
 USIBMSTODB22.PRODUCTION.DSN8BC51.(DEC_VERSION)) -
 ENABLE (CICS,DLIBATCH) CICS (CON2)
```



## REBIND PLAN (DSN)

The DSN subcommand REBIND PLAN rebinds an application plan when you make changes that affect the plan, but do not change the SQL statements in the programs. For example, you can use REBIND PLAN when you change authorizations, create a new index for the plan, or use RUNSTATS. If the rebind is successful, the process prepares an application plan and updates its description in the catalog table SYSPLAN.

REBIND PLAN is generally faster and more economical than BIND PLAN. But if you change the SQL statements or recompile a program, you should use BIND PLAN with the option ACTION(REPLACE).

For more information on using REBIND PLAN, see Section 5 of *Application Programming and SQL Guide*.

## Environment

You can use REBIND PLAN through DB2I, or enter the REBIND PLAN subcommand from a DSN session running in foreground or background.

**Data Sharing Scope:** Group

## Authorization

The plan owner must have authorization to execute *all* SQL statements embedded in the plan for REBIND PLAN to build a plan without producing error messages. For VALIDATE(BIND), DB2 verifies the authorization at bind time. For VALIDATE(RUN), DB2 verifies the authorization initially at bind time, but if the authorization check fails, DB2 rechecks it again at run time. If you use the PKLIST keyword, you must have EXECUTE authority for the packages or collections specified on PKLIST.

Table 19 explains the authorization required to run REBIND PLAN, depending on the options specified.

Table 19 (Page 1 of 2). Summary of Privileges for REBIND PLAN

| Option                                                                                                   | Authorization Required to Run REBIND PLAN                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REBIND PLAN with no change in ownership, because the OWNER keyword is not specified.                     | The authorization IDs of the process must have one of the following: <ul style="list-style-type: none"> <li>• Ownership of the plan</li> <li>• BIND privilege on the plan</li> <li>• BINDAGENT privilege from the owner of the plan</li> <li>• SYSADM or SYSCTRL authority</li> </ul>                                           |
| REBIND PLAN with no change in ownership, although the original owner is specified for the OWNER keyword. | The authorization IDs of the process must have one of the following: <ul style="list-style-type: none"> <li>• OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder</li> <li>• BINDAGENT privilege from the owner of the plan</li> <li>• SYSADM or SYSCTRL authority</li> </ul> |

## REBIND PLAN (DSN)

Table 19 (Page 2 of 2). Summary of Privileges for REBIND PLAN

| Option                                                                                                                        | Authorization Required to Run REBIND PLAN                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REBIND PLAN with change of ownership. (An authorization ID that is not the original owner is specified in the OWNER keyword.) | The new OWNER must have one of the following: <ul data-bbox="803 310 1177 367" style="list-style-type: none"><li>• BIND privilege on the plan</li><li>• SYSADM or SYSCTRL authority</li></ul> <b>Specifying the OWNER:</b> If any of the authorization IDs has the BINDAGENT privilege granted from the owner, then <i>authorization-id</i> can specify the grantor as OWNER. Otherwise, OWNER <i>authorization-id</i> must be one of the primary or secondary authorization IDs of the binder. |
| PKLIST, specifying individual packages                                                                                        | Authorization ID of the process must include one of the following: <ul data-bbox="803 619 1404 766" style="list-style-type: none"><li>• EXECUTE privilege on each package specified in the PKLIST</li><li>• PACKADM authority on specific collections containing packages or on collection *</li><li>• SYSADM authority</li></ul>                                                                                                                                                               |
| PKLIST, specifying (*), indicating all packages in the collection                                                             | Authorization ID of the process must include one of the following: <ul data-bbox="803 850 1404 972" style="list-style-type: none"><li>• EXECUTE privilege on each package in the collection</li><li>• EXECUTE privilege on <i>collection-id</i>.*</li><li>• PACKADM authority on <i>collection-id</i> or on *</li><li>• SYSADM authority</li></ul>                                                                                                                                              |

For additional information on the authorization required to execute BIND PLAN see Section 5 (Volume 2) of *Administration Guide*.



## REBIND PLAN (DSN)

### Example

**Example:** Rebind plan DSN8BC51 to enable DB2 to take advantage of a newly created index. Use FLAG(W) to issue warning, error, and completion messages, but not informational messages. Use VALIDATE(BIND) to point out any error conditions during the bind process. Use ISOLATION(CS) to prevent other applications from changing the database values that this application uses only while the application is using them. This isolation level protects changed values until the application commits or terminates. Omit the OWNER keyword to leave the plan's owner authorization ID the same. Omit the ENABLE or DISABLE keywords to use the connections previously defined for the plan.

```
REBIND PLAN (DSN8BC51) -
 FLAG (W) -
 VALIDATE (BIND) -
 ISOLATION (CS)
```

---

## -RECOVER BSDS (DB2)

The DB2 command RECOVER BSDS reestablishes dual bootstrap data sets (BSDS) after one has been disabled by a data set error. Follow these steps to reestablish dual BSDS mode:

1. Use access method services to rename or delete the failing BSDS, which DB2 has deallocated, and define a new BSDS with the same name as the failing BSDS. You can find control statements in job DSNTIJIN.
2. Issue the DB2 command RECOVER BSDS to make a copy of the good BSDS in the newly allocated data set and to reinstate dual BSDS mode.

**Abbreviation:** -REC BSDS

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- BSDS privilege
- SYSCTRL or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax

```
▶▶—RECOVER BSDS—▶▶
```

### Usage Note

**-RECOVER BSDS Following a BSDS I/O Error:** For a detailed description of steps the installation must take to reestablish dual BSDS mode after a BSDS I/O error occurs, see Section 4 (Volume 1) of *Administration Guide* .

### Example

**Example:** Reestablish dual BSDS mode.

```
-RECOVER BSDS
```

## -RECOVER INDOUBT (DB2)

---

### -RECOVER INDOUBT (DB2)

The DB2 command RECOVER INDOUBT recovers threads left indoubt because DB2 or a transaction manager could not automatically resolve the indoubt status with the commit coordinator.

This command should only be used when automatic resolution will not work. It is also critical that the commit/abort decision (that is made by the coordinator) must be determined.

**Abbreviation:** -REC IND

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

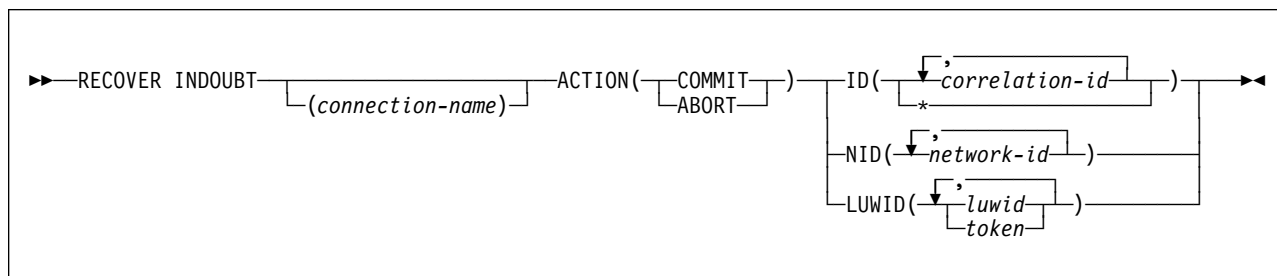
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- RECOVER privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

*(connection-name)*

Is a 1- to 8-character connection name. Allied threads (including those that are distributed) belonging to that connection name are recovered. This parameter is ignored if LUWID is specified.

The **default** is the connection name from which you enter the command. If you enter this command from an MVS console, and you are recovering an allied thread using the ID or NID parameter, you *must* supply a connection name; no default is available.

## ACTION

Tells whether to commit or cancel the indoubt thread. If there are any downstream participants for which the local thread is the coordinator, then the commit or abort decision is propagated to these participants.

**Abbreviation:** ACT

### (COMMIT)

Commits the thread.

### (ABORT)

Cancels the thread.

## ID(*correlation-id*, ...)

Tells whether to recover a specific allied thread or all allied threads (including those that are distributed) associated with the connection name.

### *correlation-id*

Is the correlation ID (of 1 to 12 characters) of a specific thread to be recovered. If you use more than one correlation ID, separate items in the list by commas.

Do not use a correlation ID that has more than one network ID associated with it. Instead, use the NID option.

(\*) Recovers all indoubt threads associated with the connection name. Even threads having the same correlation ID are resolved.

## NID(*network-id*, ...)

Identifies threads by their network IDs.

*network-id* is a network ID associated with an individual thread. You can use more than one network ID for the same connection name.

For IMS and CICS connections, a network ID is the name of the form *net-node.number*, from 3 to 25 characters in length.

- *net-node* is the network node name of the system that originated the unit of work. It uses from 1 to 8 characters.
- *number* is a unique number within the system of origin. It uses from 1 to 16 characters.

For RRSF connections, a network ID is the OS/390 RRS Unit of Recovery ID (URID) that is used to uniquely identify a unit of work. An OS/390 RRS URID is a 32-character number.

The network ID appears on the recovery log of the commit coordinator as a unique identification of a unit of work. It uses 16 bytes.

- For IMS and CICS, the network ID is an 8-byte node name immediately followed by an 8-byte number.
- For RRSF connections, the network ID is a 16-byte number.

## LUWID

Recovers the indoubt thread that has the specified LUWID.

### *luwid*

Consists of an LU network name, an LUW instance number, and a commit sequence number.

## -RECOVER INDOUBT (DB2)

The LU network name consists of a 1- to 8-character network ID, a period, and a 1- to 8-character network LU name. The LUW instance number consists of a period followed by 12 hex characters. The last element of the LUWID is the commit sequence number of 4 hex characters, preceded by a period.

### *token*

A token is an alternate way to express an LUWID. DB2 assigns a token to each thread it creates. It is a 1- to 5-digit decimal number that appears after the equal sign in all DB2 messages that display an LUWID.

If you enter 1 to 5 decimal digits, DB2 assumes that you are supplying a token. The token that DB2 assigns to a specific LUWID is unique for that DB2 subsystem, but not necessarily unique across all subsystems.

## Usage Note

**When to Use a Network ID:** *network-id* is not normally needed, because *correlation-id* can identify indoubt threads. However, if *correlation-id* is not unique, *network-id* must be used. This statement does not apply if a LUWID is specified.

## Examples

**Example 1:** Recover indoubt allied threads. Schedule a commit for all threads associated with the connection name from which the command is entered.

```
-RECOVER INDOUBT ACTION(COMMIT) ID(*)
```

**Example 2:** Recover an indoubt thread from a remote requester. Schedule a commit for the indoubt thread whose token is 1332.

```
-RECOVER INDOUBT ACTION(COMMIT) LUWID(1332)
```

**Example 3:** Recover indoubt threads from remote requesters. Schedule an abort for two indoubt threads. The first has an LUWID = DB2NET.LUNSITE0.A11A7D7B2057.0002 (the '0002' in the last segment of the LUWID represents the commit sequence number). The second has a token = 442.

```
-RECOVER INDOUBT ACTION(ABORT)
 LUWID (DB2NET.LUNSITE0.A11A7D7B2057.0002, 442)
```



## -RESET GENERICLU (DB2)

The RESET GENERICLU command allows you to purge information stored by VTAM in the coupling facility for one or more partners of a particular DB2 subsystem. The command must be issued from the DB2 that has the VTAM affinity to the particular partner LU whose information you are purging.

**Abbreviation:** -RESET GENERIC

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

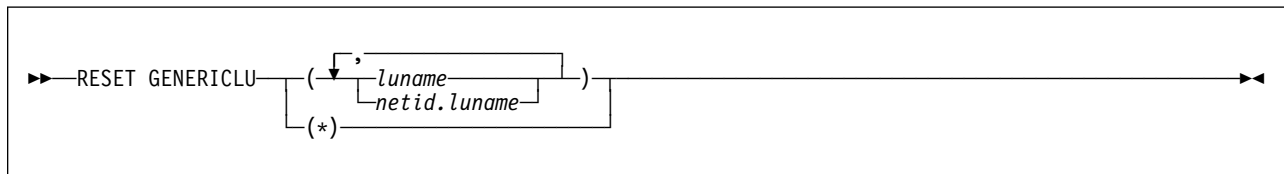
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

*(luname)*

The real VTAM LU name of the partner whose generic LU name mapping is being purged. The NETID of this partner LU must be the same as the local DB2 NETID.

*(netid.luname)*

The VTAM shared memory information associated with the specified NETID and LUNAME is purged.

**(\*)** This purges the VTAM shared memory information for all partners of this DB2 subsystem. This command option should only be used if you are planning to remove this DB2 subsystem from the DB2 group.

## -RESET GENERICLU (DB2)

### Usage Notes

The following conditions must be satisfied for the RESET GENERICLU command to be successful:

- DDF must be started.
- No VTAM sessions can be active to the partner LU specified on the command.
- DB2 must not have any indoubt thread resolution information associated with the specified partner LU.

### Examples

**Example 1:** Purge the VTAM generic name mapping associated with partner NET1.USER5LU.

```
-DB2A RESET GENERICLU(NET1.USER5LU)
```

**Example 2:** Purge the VTAM generic name mappings for all LUs that are partners of this DB2 subsystem. Use this version of the command only when removing this DB2 from the data sharing group.

```
-DB2A RESET GENERICLU(*)
```

---

## **-RESET INDOUBT (DB2)**

The DB2 command RESET INDOUBT purges information displayed in the indoubt thread report generated by the DISPLAY THREAD command.

This command *must* be used to purge indoubt thread information in the following situations:

- For threads where DB2 has a coordinator responsibility that it cannot fulfill because of participant cold start, sync point protocol errors, or indoubt resolution protocol errors.
- For threads that were indoubt but were resolved with the RECOVER INDOUBT command, and subsequent resynchronization with the coordinator shows heuristic damage.

The RESET column of a display thread report for indoubt threads indicates whether information in the report must be purged with this command.

This command can also be used to purge indoubt thread information for threads where:

- DB2 has a coordinator responsibility even when no errors have been detected that preclude automatic resolution with the participants. The FORCE keyword must be specified to purge this information. Resynchronization with affected participants is not performed.
- DB2 has a participant responsibility even when no errors have been detected that preclude automatic resolution with the coordinator. Resynchronization with the coordinator will not be performed.

**Abbreviation:** -RESET IND

## **Environment**

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

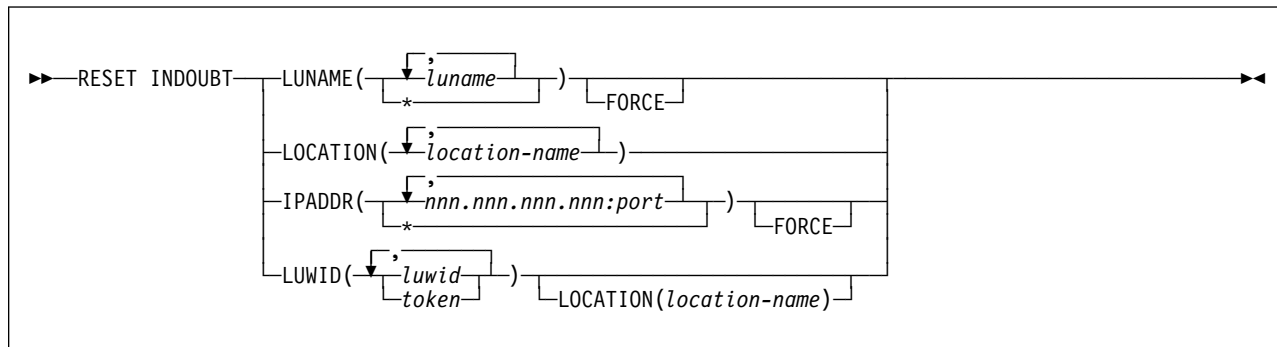
## **Authorization**

To execute this command, the privilege set of the process must include one of the following:

- RECOVER privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

### **LUNAME**(*luname*, ...)

Purges all qualifying indoubt information that pertains to the named LUNAME.

*luname*

Is expressed as a 1- to 8-character name. If you use more than one LUNAME, separate items in the list by commas.

(\*) Purges indoubt information for all SNA locations.

### **FORCE**

Forces the purging of coordinator and participant indoubt resolution responsibility even when no errors that preclude automatic resolution have been detected. FORCE can be used in conjunction with IPADDR or LUNAME.

Purging resynchronization information when no errors that preclude automatic resynchronization have been detected simulates a cold start. Thus, no connections can exist between DB2 and the named partner when this command is executed. After execution of the FORCE option, the next connection with the named partner location will be a cold start connection. If a connection with the named partner exists at the time this command is executed, execution fails with message DSNL448I.

FORCE can be used to bypass warm start connectivity problems when errors occurring in the recovery log name exchange result in the partner refusing the connection attempt.

### **LOCATION**(*location-name*, ...)

Purges all qualifying indoubt information pertaining to the named location.

*location-name* is expressed as a 1- to 16-character name, and identifies the partner, whether it is a requester or server. If the partner is not a DB2 for OS/390 subsystem, the location name may be expressed as a:

- 1 to 8 character *luname*, as defined to VTAM at the server location. This name must be enclosed with the less than (<) and the greater than (>) characters to distinguish it from a DB2 location name.
- Dotted decimal TCP/IP address.

### **IPADDR**(*nnn.nnn.nnn.nnn:port*)

Purges all qualifying indoubt information pertaining to the dotted decimal IP address that is associated with the resync port number.

This keyword can be used in place of the LUNAME keyword when the partner uses TCP/IP instead of SNA.

*nnn.nnn.nnn.nnn:port*

Is the dotted decimal IP address of the remote site followed by the resync port number. If you use more than one IP address and port, use commas to separate the items in the list.

(\*) Purges indoubt information for all TCP/IP locations.

## **LUWID**

Purges indoubt information for the thread with the specified LUWID.

*luwid*

Consists of an LU network name, an LUW instance number, and a commit sequence number.

The LU network name consists of a 1- to 8-character network ID, a period, and a 1- to 8-character network LU name. The LUW instance number consists of a period followed by 12 hex characters. The last element of the LUWID is the commit sequence number, of 4 hex characters, preceded by a period.

*token*

A token is an alternate way to express an LUWID. DB2 assigns a token to each thread it creates. It is a 1- to 5-digit decimal number that appears after the equal sign in all DB2 messages that display an LUWID.

If you enter 1 to 5 decimal digits, DB2 assumes that you are supplying a token. The token that DB2 assigns to a specific LUWID is unique for that DB2 subsystem, but not necessarily unique across all subsystems.

## **Output**

The response from this command includes any of the messages from DSNL440I through DSNL449I.

If you specify RESET INDOUBT incorrectly, you receive message DSNL440I.

## **Usage Notes**

**Purging Participant Indoubt Information:** Be cautious when using the FORCE option to purge participant indoubt information. Normally, after the use of the RECOVER INDOUBT command, automatic resolution with the coordinator determines if heuristic damage has occurred. This detection is lost if RESET INDOUBT is used before automatic resolution with the coordinator can be achieved.

**Purging Coordinator Indoubt Information:** Be cautious when using the FORCE option to purge coordinator indoubt information when no errors are precluding automatic resolution. When the information is purged, any participant that is indoubt is forced to use a heuristic decision process to resolve the indoubt logical unit of work.

---

### RUN (DSN)

The DSN subcommand RUN executes an application program, which can contain SQL statements.

### Environment

This subcommand can be issued under the DSN command processor running in either foreground or background mode, or it can be issued using the DB2I RUN panel.

**Data Sharing Scope:** Member

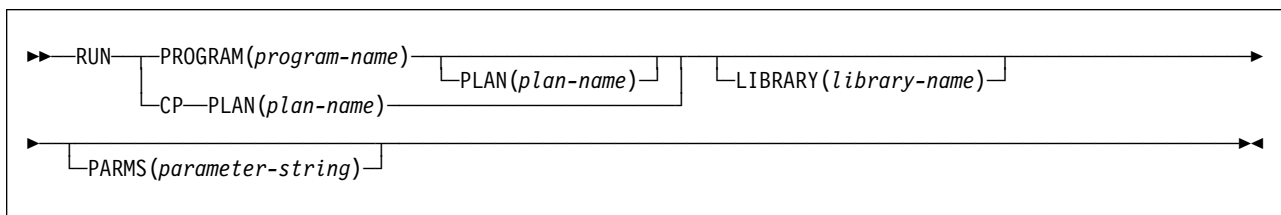
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- EXECUTE privilege on the plan
- Ownership of the plan
- SYSADM authority

To run an application, the plan must be enabled for your local server. Any associated packages from which you execute statements must also be enabled.

### Syntax



### Option Descriptions

Use at least one of the two following clauses, but do not use the same clause twice.

#### **PROGRAM** (*program-name*)

*program-name* is the name of the program you want to run.

#### **CP**

Directs input to the user's command processor, and causes a prompt to be issued: 'ENTER TSO COMMAND'. This is useful for running command processors and debugging programs (for example, COBTEST).

Processing the specified TSO command creates a new task control structure under which the TSO command executes. All application programs initiated from this TSO command session also execute under the same task structure, and must establish a new connection to DB2 if they use SQL requests.

When the TSO command completes, the new task structure is terminated, and control is returned to the original DB2 connection and task structure established by the DSN command.

Later TSO commands can be issued directly from the DSN session, or through the RUN subcommand with the CP option.

**PLAN**(*plan-name*)

Is optional after PROGRAM, but required after CP.

*plan-name* is the name of the application plan for the program.

When PROGRAM is used, the **default** plan name is *program-name*.

**LIBRARY**(*library-name*)

*library-name* is the name of the data set containing the program to be run.

If *library-name* is not specified, normal MVS library searching is used. The data sets specified in the STEPLIB DD statements are first searched for the entry point name of the program. If STEPLIB is not present, then the data sets specified in the JOBLIB DD statements are searched. If the entry point name is not found there, then the link list is searched.

**Subprograms:** Normal MVS library searching is **always** used for any subprograms loaded by the main program. If the subprograms reside in the same library as the main program, then *library-name* must also be defined for the normal MVS search pattern (STEPLIB, JOBLIB, link list). If a library defined in that way contains both the main program and any loaded subprograms, then you need not use the LIBRARY option.

**PARMS**(*parameter-string*)

*parameter-string* is a list of parameters that are to be passed to your application program. Separate items in the list by commas, blanks, or both, and enclose the list between apostrophes. If the list contains apostrophes, represent each of them by two consecutive apostrophes. The list is passed as a varying-length character string of a minimum of 1 to a maximum of 100 decimal characters.

**For Assembler:** Use a list of the form 'program parameters'. There are no run-time parameters.

No run-time or application parameter validation is performed by the RUN subcommand on the *parameter-string* passed to your application program. All specified parameter values are assumed to adhere to the parameter syntax and format criteria defined by the language in which the application program is written.

**For COBOL:** If Language Environment (Language Environment for MVS & VM) is not the run-time environment, use a list of the form B/A, where B represents a list of parameters for the COBOL application program, and A represents a list of run-time options. If program parameters are not needed, write the list in the form of /A.

If Language Environment is the run-time environment, use a list of the form A/B, where A represents a list of run-time options, and B represents a list of parameters for the COBOL application program. If run-time options are not needed, write the list in the form of /B. For compatibility, Language Environment provides the CBLOPTS run-time option. When CBLOPT(YES) is specified in CEEDOPT or CEEUOPT and the main routine is COBOL, specify the list in the form of B/A, the same form as when the run-time environment is not Language Environment CBLOPT(NO) is the default.

**For FORTRAN:** Use a list of the form A/B, where A represents a list of FORTRAN run-time options and B represents a list of parameters for the

## RUN (DSN)

FORTRAN application program. If FORTRAN run-time options are not needed, write the list in the form of B or /B. The second form must be used if a slash is present within the program arguments. If only FORTRAN run-time options are present, write the list in the form of A/.

**For PL/I:** Use a list of the form A/B, where A represents a list of run-time options, and B represents a list of parameters for the PL/I application program. If run-time options are not needed, write the list in the form /B. If the PL/I NOEXECOPS procedure option is specified, omit the “/.” System message IBM003I indicates that either you have omitted the slash, or the value passed to the PL/I run-time package was not valid.

**For C:** Use a list of the form A/B, where A represents a list of run-time options, and B represents a list of parameters for the C application program. If run-time options are not needed, write the list in the form /B. If the NOEXECOPS run-time option is in effect, omit the “/.”

## Usage Note

**Multitasking Restriction:** When running a program that uses a multitasking environment, the first task to issue an SQL statement must issue all subsequent SQL calls. That is, only one task in a multitasking environment can issue SQL calls. This task must be a subtask of, or running at the same TCB level as, the DSN main program.

## Examples

**Example 1:** Run application program DSN8BC4. The application plan has the same name. The program is in library '*prefix*.RUNLIB.LOAD'.

```
DSN SYSTEM (DSN)
RUN PROGRAM (DSN8BC4) LIB ('prefix.RUNLIB.LOAD')
```

**Example 2:** Run application program DSN8BP4. The application plan is DSN8BE51. The program is in library '*prefix*.RUNLIB.LOAD'. Pass the parameter O'TOOLE to the PL/I application program with no PL/I run-time options.

```
DSN SYSTEM (DSN)
RUN PROGRAM (DSN8BP4) PLAN (DSN8BE51) -
 LIB ('prefix.RUNLIB.LOAD') PARM ('/O'TOOLE')
```



## -SET ARCHIVE (DB2)

The DB2 command SET ARCHIVE sets the upper limit for the number of and the deallocation time of tape units for the archive log. This command overrides the values specified during installation or in a previous invocation of the SET ARCHIVE command. The changes that SET ARCHIVE makes are temporary; at restart, DB2 again uses the values set during installation.

**Abbreviation:** -SET ARC

## Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

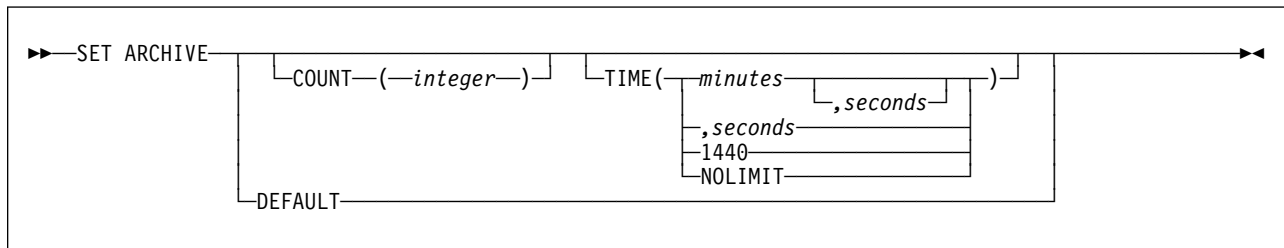
## Authorization

To execute this command, the privilege set of the process must include one of the following:

- ARCHIVE privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

The following options override the READ TAPE UNITS(COUNT) and DEALLC PERIOD TIME subsystem parameters specified at installation.

### COUNT(*integer*)

Specifies the maximum number of tape units that can be dedicated to reading archive logs. This value affects the allowed concurrent reads for unique archive data sets residing on tapes.

*integer* can range from 1 to 99.

- If the number specified is greater than the current specification, the maximum number of tape units allowable for reading archive logs increases.
- If the number specified is less than the current specification, tape units that are not being used are immediately deallocated to adjust to the new

## -SET ARCHIVE (DB2)

COUNT value. Active (or premounted) tape units remain allocated; a tape unit is a candidate for deallocation because of a lowered COUNT value only if there is no activity for the unit.

### TIME

Specifies the length of time during which an allocated archive read tape unit is allowed to remain unused before it is deallocated.

#### (minutes)

Specifies the maximum number of minutes.

*minutes* must be an integer between 0 and 1439.

#### (seconds)

Specifies the maximum number of seconds.

*seconds* must be an integer between 1 and 59.

#### (NOLIMIT) or (1440)

Indicates that the tape unit will never be deallocated. Specifying TIME(1440) is equivalent to TIME(NOLIMIT). The seconds specification is not allowed when you specify that TIME is 1440.

### DEFAULT

Resets the COUNT and TIME parameters back to the values specified during DB2 installation.

## Usage Notes

**Archive Tape Reading Performance:** To achieve the best performance for reading archive tapes, specify the maximum values allowed (within system constraints) for both the COUNT and TIME options.

**IEF238D “REPLY DEVICE NAME OR CANCEL”:** Replying “CANCEL” to this message resets the COUNT value to the current number of tape units. For example, if the current COUNT value is 10, but you reply “CANCEL” to the request for the seventh tape unit, the COUNT value is reset to 6.

**Delaying Tape Deallocation in a Data Sharing Environment:** When you submit a recover job on a member of a data sharing group that requires a tape unit that must remain unused for a certain length of time before being deallocated, the archive tape is not available to any other members of the group until the specified time has expired. Unless all recover jobs will be submitted from the same member, you might not want to use the COUNT option and ensure that field DEALLOC PERIOD on installation panel DSNTIPA has a value of 0.

## Output

The response from this command includes any of the messages from DSNJ3341 through DSNJ3371.

## Examples

**Example 1:** Allocate 2 tape units that can remain unused for 30 seconds before they are deallocated.

```
-SET ARCHIVE COUNT(2) TIME(,30)
```

**Example 2:** Allocate 4 tape units that can remain unused for 2 minutes before they are deallocated.

```
-SET ARCHIVE COUNT(4) TIME(2)
```

**Example 3:** Allocate 1 tape unit that is never deallocated.

```
-SET ARCHIVE COUNT(1) TIME(1440)
```

### SPUFI (DSN)

The DSN subcommand SPUFI executes the SQL processor using file input.

### Environment

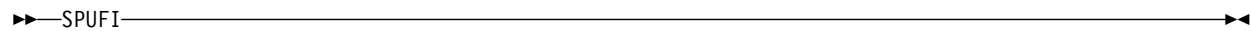
You can use this subcommand only under ISPF. You can issue it from ISPF option 6, or from a CLIST.

**Data Sharing Scope:** Member

### Authorization

None is required.

### Syntax



A syntax diagram for the SPUFI command. It consists of a horizontal line with a double arrowhead pointing left at the start and a double arrowhead pointing right at the end. The word "SPUFI" is positioned on the line, with a vertical line segment extending upwards from the left side of the word to the main horizontal line.

### Usage Notes

**SPUFI Session:** The effect of the SPUFI subcommand is to execute SPUFI and to present the SPUFI panel as the start of a SPUFI session. For a description of the panel and instructions on using SPUFI, see Section 2 of *Application Programming and SQL Guide*.

In the SPUFI session, you can access the CURRENT SPUFI DEFAULTS panel. You can change DB2I defaults by splitting the screen and accessing the DB2I DEFAULTS panel, or by changing the defaults before starting the SPUFI session.

**SPUFI Panel Variables:** The SPUFI panel variables you enter after invoking SPUFI directly with the DSN command are not saved in the same place. Panel variables therefore vary depending on whether you execute the facility directly, or through DB2I.

## /SSR (IMS)

The IMS /SSR command allows the IMS operator to enter an external subsystem command.

### Environment

This command can be issued only from an IMS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of IMS authority, as described in the *IMS/ESA Administration Guide: System*

In addition, the set of privileges held by the primary authorization ID or any of the secondary authorization IDs must include the authority to enter the DB2 command that follows /SSR. For a description of the privileges required to issue a DB2 command, see the description of the appropriate DB2 command in this book.

### Syntax

```
▶▶—/SSR—subsystem-command—▶▶
```

### Parameter Description

*subsystem-command*

For *subsystem-command*, substitute a valid subsystem command. The first character following /SSR must be the subsystem recognition character of the subsystem to which the command is to be directed (DB2).<sup>2</sup>

### Usage Note

**Routing the Command:** IMS uses the command recognition character (CRC) to determine which external subsystem, in this case DB2, receives the command. The only action taken by IMS is to route the command to the appropriate subsystem.

<sup>2</sup> The subsystem recognition character is defined in the IMS SSM member for the external subsystem.

## /START (IMS)

---

## /START (IMS)

The IMS /START command (with the SUBSYS parameter) makes connection between IMS and the specified external subsystem available. Establishing the connection allows application programs to access resources managed by the external subsystem.

The following is only a partial description of the /START command. For a complete description, see *IMS/ESA Operator's Reference*.

### Environment

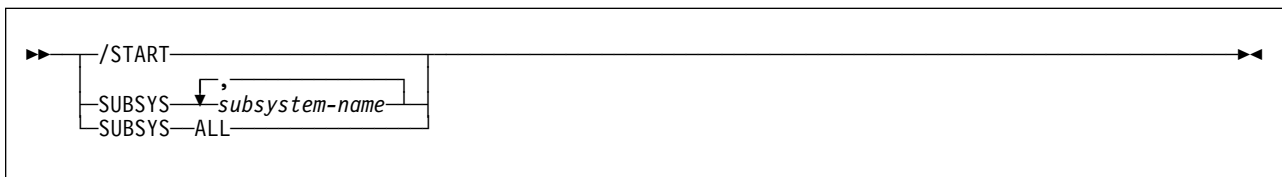
This command can be issued only from an IMS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of IMS authority, as described in the *IMS/ESA Administration Guide: System*.

### Syntax



### Option Descriptions

#### SUBSYS

Specifies one or more names of external subsystems to be connected to IMS, or all external subsystems.

*subsystem-name, ...*

For *subsystem-name*, substitute one or more names of external subsystems to be connected to IMS.

#### ALL

Indicates that all external subsystems are to be connected to IMS.

### Usage Note

**Inactive Entries:** The copy in main storage of the external subsystem PROCLIB entry is refreshed as part of /START command function when that entry is not active (that is, when the connection does not exist). This allows the installation to stop the subsystem connection, change the specifications in the PROCLIB entry, then restart the subsystem connection without bringing down IMS.

---

## -START DATABASE (DB2)

The DB2 command START DATABASE is typically used after a previous STOP DATABASE command, or after a table space, partition, or index has been placed in group buffer pool recovery pending status (GRECP), or if pages have been put on the logical page list (LPL) for that object. This command makes the specified database available for use. Depending on the options you specify, the database can be made available for read-only processing, read-write processing, or utility-only processing.

In a data sharing environment, the command can be issued from any DB2 on the group that has access to the database.

**Abbreviation:** -STA DB

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group

### Authorization

All databases specified for which the privilege set of the process has the STARTDB privilege are started. The privilege set of the process must include one of the following:

- STARTDB privilege
- DBMAINT, DBCTRL, or DBADM authority
- SYSCTRL, SYSADM or SYSOPR authority

When this set does not contain the STARTDB privilege for a specified database, an error message is issued.

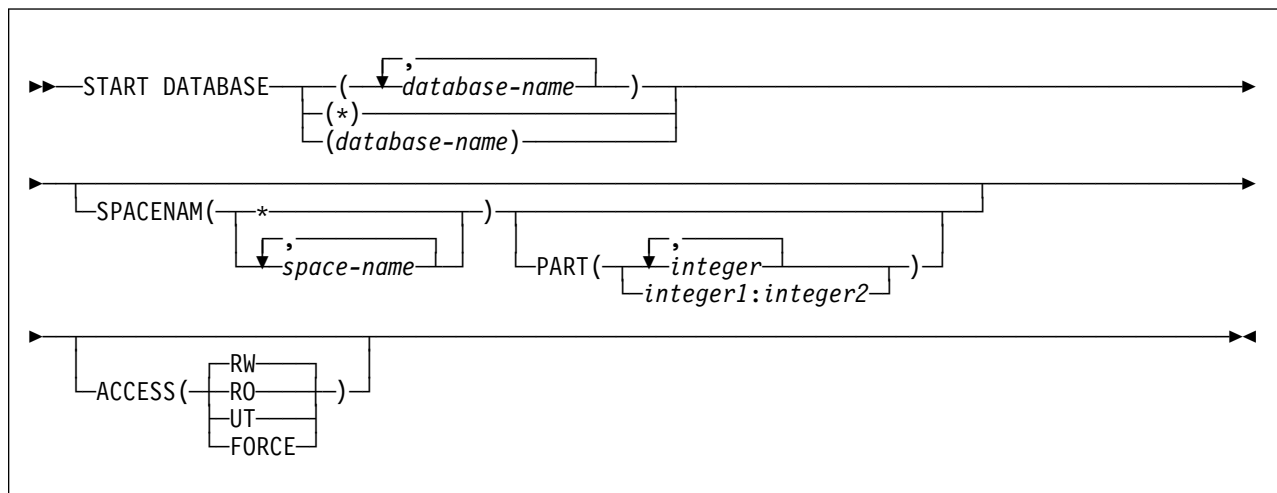
DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

When data definition control is active, installation SYSOPR or installation SYSADM authority is required to start the database, a table space, or an index space containing a registration table or index.

Database DSNDB06 contains the table spaces and index spaces required to check the authorization for using START DATABASE. If a table or index space required for this authorization check is stopped, or is unavailable because it is in LPL or GRECP status, then installation SYSADM authority is required to start any database, table space, or index space, including the ones required for the authorization check. Installation SYSOPR authority may also start DSNDB06 but only when in LPL or GRECP status and if access mode is not changed.

## -START DATABASE (DB2)

### Syntax



### Option Descriptions

*(database-name, ...)*

Is the name of a database to be started. If you use more than one name, separate names in the list by commas.

(\*) Starts all databases for which the privilege set of the process has at least DBMAINT authority (except databases already started). You cannot use (\*) with ACCESS(FORCE).

You can start DSNDB01, DSNDB06, and work file databases, such as DSNDB07, only by explicitly specifying them (for example, START DATABASE(DSNDB01)).

#### SPACENAM

Tells what particular table spaces or indexes within the database are to be started. If you use ACCESS(FORCE), you must use SPACENAM with a list of table space and index names.

**Abbreviation:** SPACE

*(space-name, ...)*

Is the name of a table space or index space to be started. You can use a list of several names of table spaces and index spaces. Separate names in the list by commas. All table spaces and index spaces must be in the single specified database.

(\*) Starts all table spaces and index spaces in the specified database. You cannot use (\*) with ACCESS(FORCE).

**PART** *(integer)*

Indicates the partition number of one or more partitions, within the specified table space or index, that are to be started. The start or stop state of other partitions does not change.

The *integer* specified must identify a valid partition number for the corresponding space name and database name. If you specify nonvalid partition



numbers, you receive an error message for each nonvalid number, but all other valid partitions that you specified are started.

*integer* can be written to designate either:

- A list of one or more partitions, or
- A range of all partition numbers that collate greater than or equal to *integer1* and less than or equal to *integer2*

Both a list and a range cannot be specified.

The PART option is valid with partitioned table spaces, partitioned indexes, and nonpartitioned type 2 indexes of partitioned table spaces. If you specify PART with a nonpartitioned table space or index on a nonpartitioned table space, you receive an error message, and the nonpartitioned space is not started.

### ACCESS

Tells whether the objects started can be read from and written to, read from only, or accessed by utilities only.

**Abbreviation:** ACC

The **default** is **ACCESS(RW)**.

#### **(RW)**

Allows programs to read from or write to the specified databases, table spaces, indexes, or partitions.

#### **(RO)**

Allows programs to only read from the specified databases, table spaces, indexes, or partitions. Any programs attempting to change data will not succeed.

#### **(UT)**

Allows only DB2 online utilities to access the specified databases, table spaces, indexes, or partitions.

#### **(FORCE)**

Resets any indications that a table space, index, or partition is unavailable because of pages in the logical page list, pending deferred restarts, write error ranges, read-only accesses, or utility controls. FORCE also resets the check pending, copy pending, and recovery pending states. Full access to the data is forced.

With ACCESS(FORCE) you must use a single database name, the SPACENAM option, and an explicit list of table space and index names. You cannot use DATABASE (\*) or SPACENAM (\*).

A utility restrictive state is reset (the utility is terminated) only if all the target objects are reset with this command. To identify which objects are target objects of the utility, use the DISPLAY DATABASE command, or run the DIAGNOSE utility with the DISPLAY SYSUTIL option.

A table space or index space started with ACCESS(FORCE) can be in an inconsistent state. See "Usage Notes" on page 252 for further instructions.

## -START DATABASE (DB2)

### Usage Notes

**Data Sets Off Line:** It is not necessary for every disk pack containing partitions, table spaces, or indexes to be online when a database is started. Packs must, however, be online when partitions, table spaces, or indexes are first referred to. If they are not, an error in opening occurs.

**Table Spaces and Indexes Explicitly Stopped:** If table spaces and indexes are stopped explicitly (using the STOP DATABASE command with the SPACENAM option), they must be started explicitly. Starting the database does not start table spaces or indexes that have been explicitly stopped.

**Effect on Objects Marked with GRECP or with LPL Entries:** If a table space, partition, or index is in the group buffer pool recovery pending (GRECP) status, or if it has pages in the logical page list (LPL), the START DATABASE command begins recovery of the object. You must specify the SPACENAM option and ACCESS (RW) or (RO).

This recovery operation is performed even if SPACENAM specifies an object that is already started.

If the object is stopped when the command is issued, then the START DATABASE command both starts the object and clears the GRECP or LPL status. If the GRECP or LPL recovery action cannot complete, the object is still started.

When recovering objects that are in GRECP or LPL status, avoid using wild cards for both the database name and the space name. Multiple START DATABASE(*dbname*) SPACENAM(\*) commands running in parallel should complete faster than one START DATABASE(\*) SPACENAM(\*) command.

If you do use wild cards for both the database name and space name, you must have DBMAINT authority and ensure that the catalog and directory databases have already been explicitly started in this order:

```
-START DATABASE(DSNDB01) SPACENAM(*)
-START DATABASE(DSNDB06) SPACENAM(*)
```

Although not recommended, you can start an object using START DATABASE ACCESS(FORCE). That deletes all LPL and write error page range entries without recovering the pages. It also clears the GRECP status.

**Use of ACCESS(FORCE):** The ACCESS(FORCE) option is intended to be used when data has been restored to a previous level after an error, by DSN1COPY or by a program that is not DB2 for OS/390, and the exception states resulting from the error still exist and cannot be reset. When using ACCESS(FORCE), it is up to the user to ensure the consistency of data with respect to DB2. For information on DSN1COPY, see *Utility Guide and Reference*.

If an application process requests a transaction lock on a table space that is in a restrictive status (RECP, PSRCP) or has a required index in a restrictive status, DB2 acquires the lock. DB2 does not detect the status until the application tries to access the table space or index, when the application receives an error message indicating that the resource is not available (SQLCODE -904). After receiving this message, the application should release the lock, either by committing or rolling back (if the value of the RELEASE option is COMMIT) or by ending (if the value of RELEASE is DEALLOCATE). If you issue the command START DATABASE

ACCESS(FORCE) for either the table space or the index space while the lock is in effect, the command fails.

If an object has retained locks (that is, a member of a DB2 data sharing group has failed and the locks it held on the object are retained in the lock structure), then START DATABASE ACCESS (FORCE) is not allowed.

**Restricted Mode (RO or UT):** When a START DATABASE command for a restricted mode (RO and UT) takes effect depends upon whether applications are started after -START DATABASE has completed, or whether applications are executing at the time the command is issued. For applications started after -START DATABASE has completed, access restrictions are effective immediately. For applications executing at the time —START DATABASE is issued, the access restrictions take effect when a subsequent claim is requested or the application is allowed to run to completion. Whether the application is interrupted by the —START DATABASE command depends upon various factors. These factors include the ACCESS mode specified on the —START DATABASE command, the type of drain activity, if any, on the table space or partition, and whether there are held cursors on the table space or partition.

If the table space, index, or partition must be accessed in a mode that is incompatible with the ACCESS type currently in effect, DB2 issues a resource unavailable message.

For shared owner databases, a STOP DATABASE command must be issued to quiesce a database or table space prior to issuing the START DATABASE command.

**Communications Database (CDB) or Resource Limit Facility (RLF):** If the communications database or resource limit facility is currently being used by any member of the data sharing group, any attempt to start either active database or table space with ACCESS(UT) fails.

**Synchronous Processing Completion:** Message DSN9022I indicates that synchronous processing has completed successfully.

**Asynchronous Processing Completion:** Recovery of objects in GRECP status or with pages on the LPL is performed asynchronously. Message DSNI022I is issued periodically to give you the progress of the recovery. The starting of databases, table spaces, or indexes (a synchronous task) often completes before the recovery operation starts. Therefore, when DB2 issues message DSN9022I, which indicates that synchronous processing has completed, the recovery of objects might not be complete. Message DSNI006I is issued in response to START DATABASE when the object (table space or index space) identified by TYPE and NAME had group buffer pool recovery pending (GRECP) or logical page list (LPL) status, and recovery was triggered. The START DATABASE command does not complete until the asynchronous task of recovery completes.

Message DSNI021I indicates that asynchronous processing for an object has completed. You can issue the command DISPLAY DATABASE to determine whether the recovery operation for all objects is complete. If it is complete, the output from the command shows either a RW or a RO status without LPL or GRECP.

## -START DATABASE (DB2)

### Examples

**Example 1:** Start table space DSN8S51E in database DSN8D51A. Recover the table space if it is in GRECP status or recover the pages on the LPL if one exists.

```
-START DATABASE (DSN8D51A) SPACENAM (DSN8S51E)
```

**Example 2:** Start all databases (except DSNDDB01, DSNDDB06, and work file databases) for which you have authority. Recovery for any objects with GRECP or LPL status is not performed.

```
-START DATABASE (*)
```

**Example 3:** Start the third and fourth partitions of table space DSN8S51E in database DSN8D51A for read-only access. Recover the partitions if they are in GRECP status or recover the pages on the LPL if one exists.

```
-START DATABASE (DSN8D51A) SPACENAM (DSN8S51E) PART (3,4) ACCESS (RO)
```

## -START DB2 (DB2)

The DB2 command START DB2 initializes the DB2 subsystem. When the operation is complete, the DB2 subsystem is active and available to TSO applications and to other subsystems (for example, IMS and CICS).

The effect of restarting the system can be controlled by a “conditional restart control record,” which you create by the DSNJU003 (change log inventory) utility. For more details on the effects, see “Usage Notes” on page 256 and the description of the DSNJU003 utility in *Utility Guide and Reference*.

**Abbreviation:** -STA DB2

## Environment

This command can be issued only from an MVS console. The name of the DB2 subsystem is determined by the command prefix. (This was called the subsystem recognition character (SRC) in previous DB2 releases). For example, -START indicates that the DB2 subsystem to be started is the one with '-' as the command prefix.

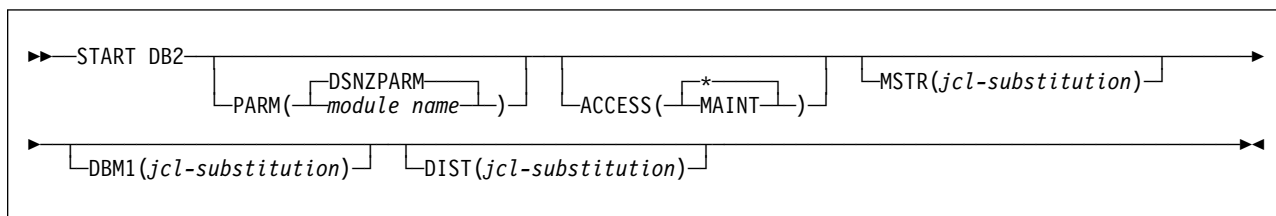
The command is rejected if the DB2 subsystem is already active. The restart recovery status of DB2 resources is determined from the prior DB2 shutdown status.

**Data Sharing Scope:** Member

## Authorization

None is required. However, the command can be executed only from an MVS console with the START command capability. Please refer to the appropriate MVS/ESA publication.

## Syntax



## Option Descriptions

None of the following options are required.

### **PARM(module-name)**

Specifies the load module that contains the DB2 subsystem parameters.

*module-name* is the name of a load module provided by the installation.

The **default** is DSNZPARM, which is provided by DB2.

## -START DB2 (DB2)

### ACCESS

Tells whether access to DB2 is to be general or restricted.

**Abbreviation:** ACC

(\*) Makes access general; all authorized users can connect to DB2.

The **default** is **ACCESS( )**.

### (MAINT)

Prohibits access to any authorization IDs other than install SYSADM and install SYSOPR.

For data sharing, ACCESS(MAINT) restricts access on only the DB2 member on which you execute this command. Other members of the data sharing group are unaffected.

### MSTR(*jcl-substitution*)

Gives parameters and values to be substituted in the EXEC statement of the JCL that executes the startup procedure for the system services address space.

### DBM1(*jcl-substitution*)

Gives parameters and values to be substituted in the EXEC statement of the JCL that executes the startup procedure for the database services address space.

### DIST(*jcl-substitution*)

Gives parameters and values to be substituted in the EXEC statement of the JCL that executes the startup procedure for the distributed services address space.

### (*jcl-substitution*)

One or more character strings of the form *keyword = value*, enclosed between apostrophes. If you use more than one character string, separate the strings by commas and enclose the entire list between a single pair of apostrophes.

It is recommended that the keyword be omitted, therefore using the parameters provided in the startup procedure.

## Usage Notes

**Command Prefix:** If your installation has more than one DB2 subsystem, you must define more than one command prefix.

**Conditional Restart:** A conditional restart control record can prevent a complete restart, and specify "current status rebuild" only. In that case, these actions occur during restart:

- Log records are processed to the extent determined by the conditional restart control record.
- These values are displayed:
  - The relative byte address (RBA) of the start of the active log
  - The RBA of the checkpoint record
  - The status counts for units of recovery
  - The display table for restart unit of work elements
- The restart operation terminates with an abend.

**Endless Wait During Start:** It is possible for the start operation to begin and fail to complete, if the system services address space starts and the database services address space cannot start. If a seemingly endless wait occurs, cancel the system services address space from the console, and check both startup procedures for JCL errors.

**Starting Members of a Data Sharing Group:** To start members of a data sharing group, you must enter a START DB2 command for each subsystem in the group. If it is the first startup of the group, you must start the originating member (the first DB2 installed) first.

## Examples

**Example 1:** Start the DB2 subsystem.

```
-START DB2
```

**Example 2:** Start the DB2 subsystem and provide a new value for the REGION parameter in the startup procedure for the system services address space.

```
-START DB2 MSTR('REGION=6000K')
```

**Example 3:** Start the DB2 subsystem. Assuming that the EXEC statement of the JCL that executes the startup procedure for the system services address space uses the symbol RGN, provide a value for that symbol.

```
-START DB2 MSTR('RGN=6000K')
```

**Example 4:** DB2 subsystems DB1G and DB2G are members of a data sharing group. Both were installed with a command prefix scope of STARTED. Start DB1G and DB2G by routing the appropriate commands to the MVS system on which they are to be started, MVS1 and MVS2.

```
ROUTE MVS1,-DB1G START DB2
ROUTE MVS2,-DB2G START DB2
```

## -START DDF (DB2)

---

## -START DDF (DB2)

The DB2 command START DDF starts the distributed data facility (DDF) if it has not already been started.

**Abbreviation:** -STA DDF

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



```
▶▶—START DDF—————▶▶
```

### Usage Note

The START DDF command activates the DDF interface to VTAM and TCP/IP.

### Example

**Example:** Start the distributed data facility.

```
-START DDF
```



## START irlmproc (MVS IRLM)

The START *irlmproc* command starts an IRLM component with a procedure put in place by the installation. Symbolic parameters in the procedure can be overridden on the START *irlmproc* command.

### Environment

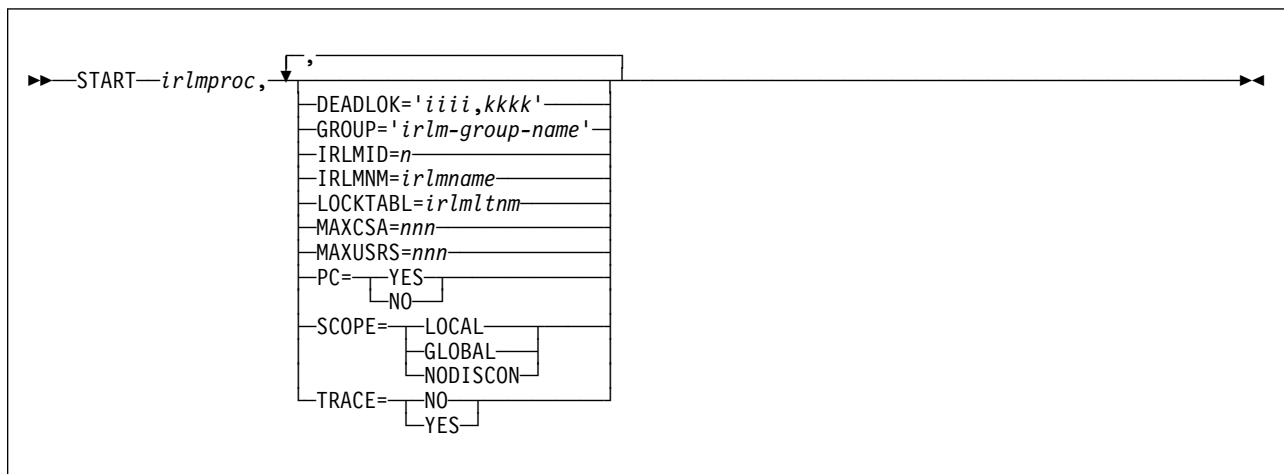
This command can be issued only from an MVS console.

**Data Sharing Scope:** Member

### Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

### Syntax



Options must be separated by commas with no spaces.

### Option Descriptions

*irlmproc*

Is the procedure name of the IRLM to be started.

None of the following options are required:

**DEADLOK='iii,kkkk'**

Specifies the local deadlock-detection interval in seconds (*iii*), and the number of local cycles (*kkkk*) that are to occur before a global detection is initiated.

*iii* Is a 1- to 4-digit number from 1 to 9999 that specifies the length in seconds of the IRLM local deadlock-detection interval. Any value from 1 to 9999 may be specified but if the value is greater than 5, IRLM uses 5.

*kkkk*

Is a 1- to 4-digit number from 1 to 9999 that specifies the number of local deadlock cycles that must expire before global deadlock detection is performed. Any value from 1 to 9999 may be specified but IRLM uses 1. The recommended value to specify is 1.

In a data sharing environment, IRLM synchronizes all of the DEADLOCK values in the group to the values specified on the most recent IRLM to join the group. The DEADLOCK values may be changed by starting a member with the values desired. To reduce confusion, it is recommended that the installation specify the same value for DEADLOCK on all of its IRLM start-up procedures and use the START *irlmproc* command to override this value only when the interval must be increased from its original value.

**GROUP=' irlm-group-name'**

In a data sharing environment, specifies the name of the cross system coupling facility (XCF) group to which the IRLM belongs as the lock manager for DBMSs sharing the same data. All IRLMs in the same group must specify the same value for LOCKTABL and unique values for IRLMID.

The group name is used as the XCF group name. The name must not start with 'SYS' and must not be the same name specified for LOCKTABL.

In a non-data-sharing environment (SCOPE=LOCAL), GROUP is ignored.

**IRLMID=*n***

Specifies a decimal number that is used to distinguish between IRLMs in a data sharing group. The IRLM with the lowest ID in the group becomes the global deadlock manager for the group when in you are in a data sharing mode.

*n* can be either a 1- to 3-digit number from 1 to 255, or a printable character in quotation marks. Note that this IRLM ID does not relate directly to the limit of IRLM members that can be in the group. That limit is determined by the current hardware limits (currently 32).

When *n* is specified as a printable character, IRLM uses the EBCDIC value of the printable character as the IRLMID (such as X'C4'). The printable character must be surrounded by enough single quotes to permit IRLM to see it as a printable character. Because of the way MVS interprets quotes, there must be seven quotes on either side of the characters. For example, if you want to specify the printable character 'D', you must specify it here as IRLMID='D'.

A unique IRLMID must be specified for each IRLM in a group (IRLMs with the same value specified for the GROUP option).

**IRLMNM=*irlmname***

Specifies a 4-byte MVS subsystem name assigned to this IRLM. (Although MVS can accept names that are less than 4 bytes, IRLM requires a 4-byte name.)

**LOCKTABL=*irlmltnm***

Specifies the lock table to be used by this group. This option is overridden by DB2; it is needed in an IMS environment.

In a non-data-sharing environment (SCOPE=LOCAL), LOCKTABL is ignored.

**MAXCSA= *nnn***

Specifies the maximum amount of CSA (including ECSA) the IRLM can use for its lock structures . *nnn* must be a 1- to 3-digit number from 1 to 999. The number indicates what multiple of 1MB of storage the IRLM will use. For example, MAXCSA=5 allows the IRLM to use 5MB of CSA and ECSA. In displays, this storage is called *accountable* storage because it is

accountable to the value you set for MAXCSA. This parameter is ignored when PC=YES.

The default value for MAXCSA is 6MB.

Use the accountable storage high water mark (AHWM) data from messages DXR100I and DXR121I to monitor IRLM's usage of common storage, and as a basis for adjustments to the MAXCSA value.

#### **MAXUSRS=nnn**

Specifies the initial maximum number of members in the data sharing group. The specified value determines the size of each lock entry in the lock table portion of the lock structure, as shown in Table 20.

*Table 20. Effect of MAXUSRS on Initial Lock Table Entry Size*

| <b>MAXUSRS</b> | <b>Initial Size of Lock Entry</b> |
|----------------|-----------------------------------|
| 7 or less      | 2 bytes                           |
| ≥ 8 and < 24   | 4 bytes                           |
| ≥ 24 and < 33  | 8 bytes                           |

*nnn* must be a 1- to 2-digit number from 1 to 32. The default is 7. The recommended value is 7 or less.

In a non-data-sharing environment (SCOPE=LOCAL), MAXUSRS is ignored.

#### **PC=**

Specifies whether the IRLM is to use the MVS cross-memory services. The specification of this value indicates where the lock control block resides.

**YES** Uses the cross-memory services. The lock control block resides in IRLM private storage. The MAXCSA parameter is ignored.

**NO** Does not use the cross-memory services. The lock control block resides in ECSA. The MAXCSA parameter is used.

#### **SCOPE=**

Specifies whether the IRLM is to be used in a data sharing environment.

##### **LOCAL**

Specifies the IRLM is in a non-data-sharing environment and there is no intersystem sharing.

##### **GLOBAL**

Specifies the IRLM is in a data sharing environment and that inter-system sharing is to be performed.

##### **NODISCON**

Specifies that IRLM is in a data sharing environment and that inter-system sharing is to be performed. IRLM remains connected to the data sharing group even when no DBMSs are identified to it. You must explicitly stop IRLM to bring it down.

If you specify the NODISCON option, there is less impact on other systems when a DB2 subsystem fails because MVS is not required to perform certain recovery actions that it normally performs when IRLM comes down. Using the NODISCON option might allow DB2 to restart

## START..., (MVS IRLM)

more quickly after a DB2 subsystem normally or abnormally terminates because it does not have to wait for IRLM to rejoin the IRLM data sharing group.

### **TRACE=**

Specifies whether the IRLM is to capture traces in wrap-around IRLM buffers. Each buffer is reused when the previous buffer is filled. Traces are captured at IRLM startup. The default is TRACE NO.

### **NO**

Does not capture traces unless the TRACE CT command is issued. See "TRACE CT (MVS IRLM)" on page 304 for details.

### **YES**

Captures traces in wrap-around buffers.

## Example

**Example:** Enter the following command on the MVS system console:

```
| S ir1mproc,MAXCSA=8
```

```
| This command starts the IRLM with 8MB for MAXCSA which controls the CSA
| (including ECSA) usage for locks when PC=NO.
```

---

**-START PROCEDURE (DB2)**

For both DB2-established and WLM-established stored procedure address spaces, the DB2 command START PROCEDURE activates the definition of a stored procedure that is stopped or refreshes one that is cached. If the rows in SYSIBM.SYSPROCEDURES that are associated with a procedure name are defined correctly, the updated definitions replace any values that are currently cached, and the procedure status is set to “started.”

One of the following can also occur:

- If the DB2-established stored procedures address space is not connected to DB2, MVS starts it.
- If the stored procedures address space is already connected, and some procedure listed in the command is stopped, DB2 stops and restarts the Language Environment environment. At restart, DB2 deletes the existing stored procedure load modules from memory. A deleted load module is reloaded when a CALL statement for that procedure is executed. For WLM-established stored procedures address spaces, a WLM command is needed to do the reload. For example:

```
MVS VARY WLM,APPLENV=applenv,REFRESH
```

On successful completion of the command, queued requests for the specified stored procedures begin executing. The abend counts for those procedures are set to zero.

You do not have to issue START PROCEDURE when defining a new stored procedure to DB2. DB2 automatically activates the new definition when it first receives an SQL CALL statement for the new procedure.

**Abbreviation:** -STA PROC

## Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

## Authorization

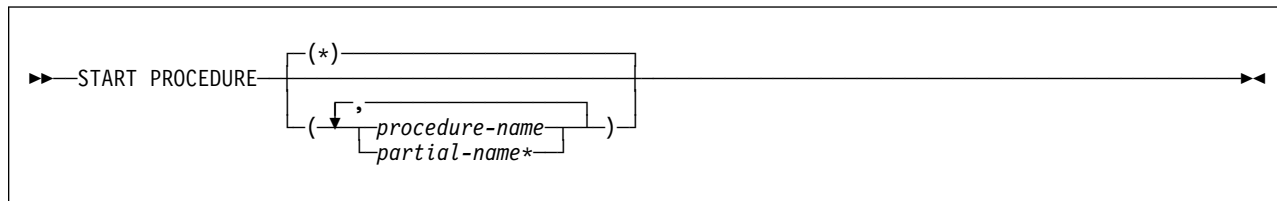
To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## -START PROCEDURE (DB2)

### Syntax



### Option Descriptions

#### *procedure-name*

Marks the named stored procedures as available to be called. The information in SYSIBM.SYSPROCEDURES that is associated with the procedures is cached.

If no procedures are named, all stored procedures are started. The information from SYSIBM.SYSPROCEDURES is refreshed for all procedures named in START PROCEDURE, STOP PROCEDURE, or an SQL CALL since DB2 was last started.

#### *partial-name\**

Starts a set of stored procedures. The names of all procedures in the set begin with *partial-name* and can end with any string, including the empty string. For example, ABC\* starts all stored procedures with names that begin with ABC.

(\*) Starts all stored procedures. The information in SYSIBM.SYSPROCEDURES is refreshed for all procedures named in START PROCEDURE, STOP PROCEDURE, or an SQL CALL since DB2 was last started.

### Usage Notes

**Errors in a Definition of a Stored Procedure:** If errors are detected in the definitions in SYSIBM.SYSPROCEDURES for a stored procedure, all rows for that procedure are ignored by START PROCEDURE, leaving the status and cached information unchanged. If the procedure was not already stopped, calls to it continue to be accepted, using the cached information.

Hence, if you make an error when redefining a stored procedure, the existing procedure definition is still used. But be sure to correct any errors in SYSIBM.SYSPROCEDURES before stopping DB2, because stopping and restarting DB2 deletes the cached information.

**Management of Stored Procedures Address Space:** The START PROCEDURE command works differently depending upon how the DB2 stored procedures address spaces are managed. WLM-established stored procedure address spaces are controlled by MVS WLM, rather than the START PROCEDURE command. For more information, see Section 4 (Volume 1) of *Administration Guide*.

## **Examples**

**Example 1:** Start all stored procedures, and refresh all DB2 system information concerning SYSIBM.SYSPROCEDURES.

```
-START PROCEDURE
```

```
DSNX946I START PROCEDURE SUCCESSFUL FOR *
```

**Example 2:** Instruct DB2 to read the SYSIBM.SYSPROCEDURES table for specific stored procedures, and start any requests waiting for those procedures.

```
-START PROCEDURE(USERPRC1,USERPRC2)
```

```
DSNX946I START PROCEDURE SUCCESSFUL FOR USERPRC1
```

```
DSNX946I START PROCEDURE SUCCESSFUL FOR USERPRC2
```

## -START RLIMIT (DB2)

---

## -START RLIMIT (DB2)

The DB2 command START RLIMIT starts the resource limit facility (governor) and specifies a resource limit specification table for the facility to use.

You can issue START RLIMIT even if the resource limit facility is active. The resource limit specification table you identify is used for new threads, and existing threads continue to be subject to the limits in the table that was active at the time they were created.

**Abbreviation:** -STA RLIM

## Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

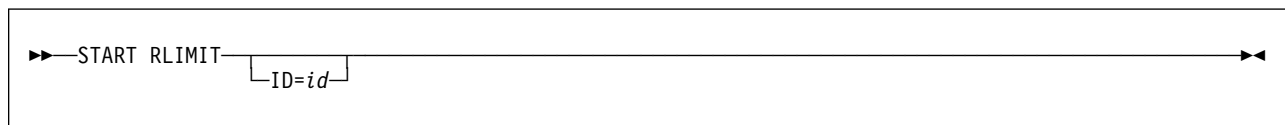
## Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

The following keyword is optional.

### ID=

Identifies the resource limit specification table for the governor to use.

*id* is the one or two identification characters specified when the table was created. See Section 5 (Volume 2) of *Administration Guide* for more information about resource limit specification tables.

The full name of the table is *authid.DSNRLSTid*, where *authid* is the value that was specified in field RESOURCE AUTHID on installation panel DSNTIPP.

The **default** ID is the value that was specified in field RLST NAME SUFFIX on installation panel DSNTIPO.



## Example

*Example:* Start the resource limit facility.

```
-START RLIMIT ID=01
```

## -START TRACE (DB2)

---

### -START TRACE (DB2)

The DB2 command START TRACE starts DB2 traces. For more information about the trace facility, see Section 5 (Volume 2) of *Administration Guide*.

There is an additional option to this command and values for a few options that are not described here. They are intended for service and use under the direction of IBM support personnel. For details, see *Diagnosis Guide and Reference*.

**Abbreviation:** -STA TRA

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

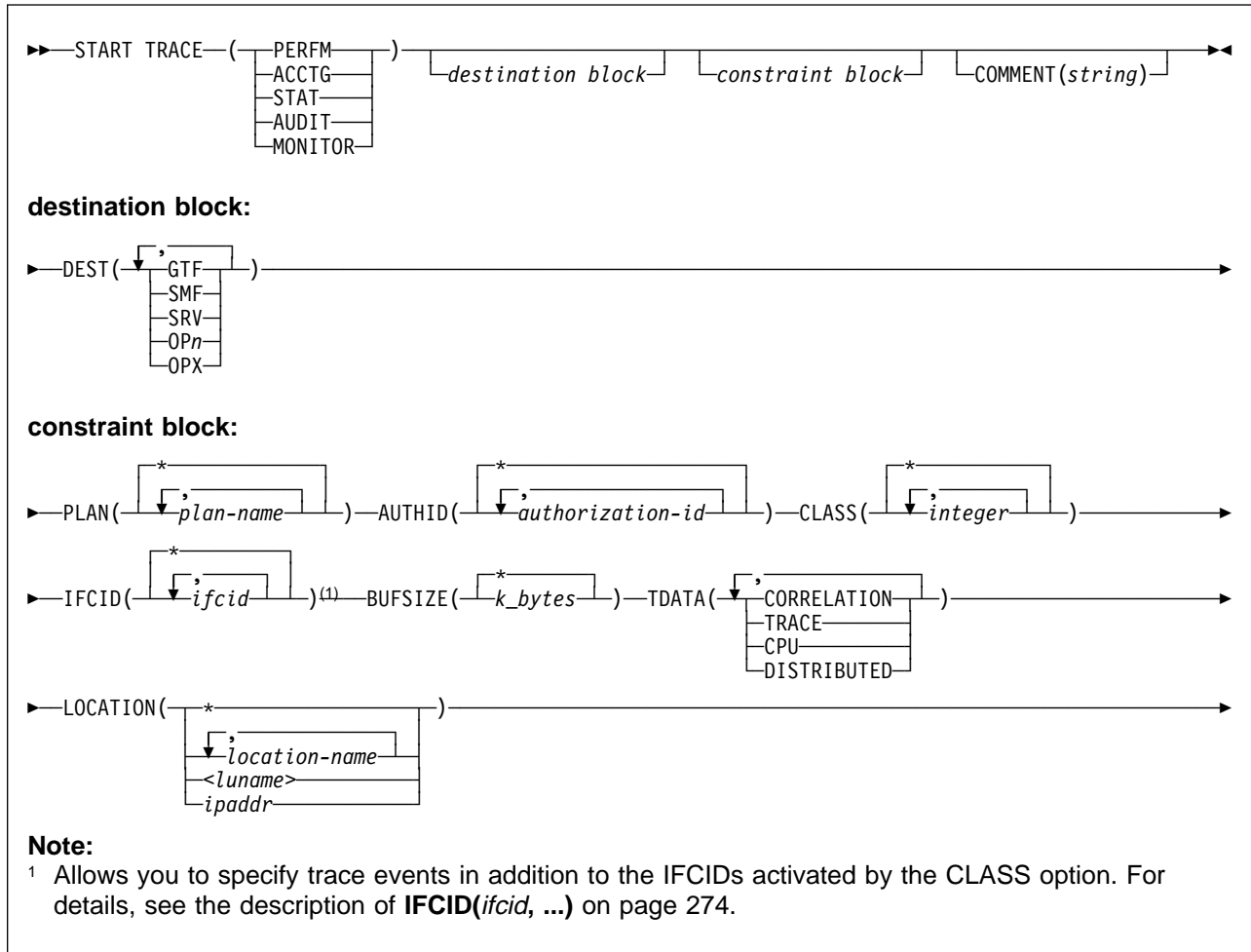
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- TRACE privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

You must specify a trace type.

The options PERFM, ACCTG, STAT, AUDIT, and MONITOR identify the type of trace started.

### (PERFM)

Is intended for performance analysis and tuning, and includes records of specific events in the system.

**Abbreviation:** P

### (ACCTG)

Is intended to be used in accounting for a particular program or authorization ID, and includes records written for each thread.

**Abbreviation:** A

### (STAT)

Collects statistical data broadcast by various components of DB2, at time intervals that can be chosen during installation.

## -START TRACE (DB2)

**Abbreviation:** S

LOCATION cannot be specified when you choose a statistics trace.

### (AUDIT)

Collects audit data from various components of DB2.

**Abbreviation:** AU

### (MONITOR)

Collects monitor data. Makes trace data available to DB2 monitor application programs.

**Abbreviation:** MON

### COMMENT(*string*)

Gives a comment that is reproduced in the trace output (except in the resident trace tables), and can be used to record why the command was issued.

*string* is any character string; it must be enclosed between apostrophes if it includes a blank, comma, or special character.

## The Destination Block

### DEST

Specifies where the trace output is to be recorded. You can use more than one value, but do not use the same value twice. If you do not specify a value, the trace output is sent to the default destination shown in Table 21.

If the specified destination is not active or becomes inactive after you issue the START TRACE command, you receive message DSNW133I, which indicates that the trace data is lost. This applies for destinations GTF, SRV, and SMF. You also receive this message for destinations OP*n* and OPX if START TRACE is not issued by an application program.

**Abbreviation:** D

The allowable values and the default value depend on the type of trace started, as shown in the following table:

Table 21. Allowable Destinations for Each Trace Type

| Type    | GTF     | SMF     | SRV     | OP <i>n</i> | OPX     |
|---------|---------|---------|---------|-------------|---------|
| PERFM   | Default | Allowed | Allowed | Allowed     | Allowed |
| ACCTG   | Allowed | Default | Allowed | Allowed     | Allowed |
| STAT    | Allowed | Default | Allowed | Allowed     | Allowed |
| AUDIT   | Allowed | Default | Allowed | Allowed     | Allowed |
| MONITOR | Allowed | Allowed | Allowed | Allowed     | Default |

The meaning of each value is as follows:

**Value**    **Trace output is recorded by ...**

GTF        The MVS generalized trace facility (GTF). The record identifier for records from DB2 is X'0FB9'.

SMF The system management facility. The SMF record type of DB2 trace records depends on the IFCID record, as shown in the following list:

| IFCID Record                         | SMF Record Type |
|--------------------------------------|-----------------|
| 1 (SYSTEM SERVICES STATISTICS)       | 100             |
| 2 (DATABASE SERVICES STATISTICS)     | 100             |
| 3 (AGENT ACCOUNTING)                 | 101             |
| 202 (DYNAMIC SYSTEM PARAMETERS)      | 100             |
| 230 (DATA SHARING GLOBAL STATISTICS) | 100             |
| 239 (AGENT ACCOUNTING OVERFLOW)      | 101             |
| ALL OTHERS                           | 102             |

SRV An exit to a user-written routine. For instructions and an example of how to write such a routine, see the macro DSNWVUSER in library *prefix.SDSNMACS*.

OP $n$  A specific destination.  
 $n$  can be an integer from 1 to 8.

OPX A generic destination which uses the first free OP $n$  slot.  
Only applications that start a trace to an OP $n$  buffer can read that buffer. For further information on starting a trace via an application program, see Appendix E (Volume 2) of *Administration Guide*.

All traces to an OPX destination must be stopped before the buffer is marked as not in use. Traces that are started to an OPX buffer that was formerly in use write over the storage any previous traces had set.

## The Constraint Block

The constraint block places optional constraints on the kinds of data collected by the trace. The allowable constraints depend on the type of trace started, as shown in the following table:

Table 22. Allowable Constraints for Each Trace Type

| Type    | PLAN    | AUTHID  | CLASS   | LOCATION |
|---------|---------|---------|---------|----------|
| PERFM   | Allowed | Allowed | Allowed | Allowed  |
| ACCTG   | Allowed | Allowed | Allowed | Allowed  |
| STAT    | NO      | NO      | Allowed | NO       |
| AUDIT   | Allowed | Allowed | Allowed | Allowed  |
| MONITOR | Allowed | Allowed | Allowed | Allowed  |

The meaning of each option is as follows:

### PLAN(*plan-name*, ...)

Introduces a list of specific plans for which trace information is gathered. You cannot use this option for a STAT trace.

The **default** is **PLAN(\*)**.

(\*) Starts a trace for all plans.

## -START TRACE (DB2)

### *plan-name*

Is the name of an application plan. You can use up to eight names; a separate trace is started for each name. If you use more than one name, you can use only one value for AUTHID and LOCATION.

### **AUTHID**(*authorization-id*, ...)

Introduces a list of specific authorization IDs for which trace information is gathered. The authorization IDs specified must be the primary authorization IDs. You cannot use this option for a STAT trace.

The **default** is **AUTHID(\*)**.

(\*) Starts a trace for all authorization IDs.

### *authorization-id*

Specifies an authorization ID. You can use up to eight identifiers; a separate trace is started for each identifier. If you use more than one identifier, you can use only one value for PLAN and LOCATION.

### **CLASS**(*integer*, ...)

Introduces a list of classes of data gathered. What classes are allowable, and their meaning, depends on the type of trace started.

#### **Abbreviation:** C

When this option is omitted, all the default classes within the trace type are activated. The **default** classes for each trace type are marked by asterisks (\*) in Table 23.

(\*) Starts a trace for all classes of the trace type.

### *integer*

Is any number in the list that follows. You can use any number of classes that are allowed for the type of trace started.

Table 23 (Page 1 of 3). Classes for DB2 Trace Types

| Trace Type | Class                   | Description of Class                                                    | IFCIDs Activated                                                        |
|------------|-------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Accounting | 1*                      | Standard accounting data                                                | 3,106,239                                                               |
|            | 2                       | Entry or exit from DB2 event signalling                                 | 232                                                                     |
|            | 3                       | Elapsed wait time in DB2                                                | 6-9,32,33,44,45,117,118,127,128,170,171,174,175,213-216,226,227,242,243 |
|            | 4                       | Installation-defined accounting record <sup>1</sup>                     | 151                                                                     |
|            | 5                       | Time spent processing IFI requests                                      | 187                                                                     |
|            | 6                       | Reserved                                                                |                                                                         |
|            | 7                       | Entry or exit from DB2 event signalling for package and DBRM accounting | 232,240                                                                 |
|            | 8                       | Wait time for a package                                                 | 6-9,32,33,44,45,117,118,127,128,170,171,174,175,213-216,226,227,241-243 |
|            | 10 - 29                 | Reserved                                                                |                                                                         |
| 30 - 32    | Available for local use |                                                                         |                                                                         |
| Audit      | 1*                      | Access attempts denied due to inadequate authorization                  | 140                                                                     |

Table 23 (Page 2 of 3). Classes for DB2 Trace Types

| Trace Type  | Class   | Description of Class                                                    | IFCIDs Activated                                     |
|-------------|---------|-------------------------------------------------------------------------|------------------------------------------------------|
|             | 2       | Explicit GRANT and REVOKE                                               | 141                                                  |
|             | 3       | CREATE, ALTER, and DROP operations against audited tables               | 142                                                  |
|             | 4       | First change of audited object                                          | 143                                                  |
|             | 5       | First read of audited object                                            | 144                                                  |
|             | 6       | Bind time information about SQL statements that involve audited objects | 145                                                  |
|             | 7       | Assignment or change of authorization ID                                | 55,83,87,169, 312                                    |
|             | 8       | Utilities                                                               | 23,24,25                                             |
|             | 9       | Installation-defined audit record <sup>1</sup>                          | 146                                                  |
|             | 10 - 29 | Reserved                                                                |                                                      |
|             | 30 - 32 | Available for local use                                                 |                                                      |
| Statistics  | 1*      | Statistics data                                                         | 1,2,105,106,202                                      |
|             | 2       | Installation-defined statistics record <sup>1</sup>                     | 152                                                  |
|             | 3       | Deadlock, group buffer pool, data set extension information             | 172,196,250, 258, 261,262,313                        |
|             | 4       | DB2 exceptional conditions                                              | 191-195,203-210,235,236,238,267,268                  |
|             | 5       | DB2 data sharing statistics record                                      | 230                                                  |
|             | 6 - 29  | Reserved                                                                |                                                      |
|             | 30 - 32 | Available for local use                                                 |                                                      |
| Performance | 1*      | Background events                                                       | 1,2,31,42,43,76-79,102,103,105-107,153               |
|             | 2*      | Subsystem events                                                        | 3,68-75,80-89,106,174,175                            |
|             | 3*      | SQL events                                                              | 22,53,55,58-66,92,95-97,106,112,177, 233,237,272,273 |
|             | 4       | Reads to and writes from the buffer and EDM pools                       | 6-10,29-30,105-107,127,128,226,227                   |
|             | 5       | Write to log; archive log                                               | 32-41,104,106,114-120,228,229                        |
|             | 6       | Summary lock information                                                | 20,44,45,105-107,172,196,213,214,218                 |
|             | 7       | Detailed lock information                                               | 21,105-107,223                                       |
|             | 8       | Data scanning detail                                                    | 13-18,105-107,125,221,222,231,305, 311               |
|             | 9       | Sort detail                                                             | 26-28,95-96,106                                      |
|             | 10      | BIND, commands, and utilities detail                                    | 23-25,90,91,105-107,108-111,201,256                  |
|             | 11      | Storage usage events                                                    | 46-52,56,57,93,94,106,113                            |
|             | 12      | Storage manager                                                         | 98-101, 106                                          |
|             | 13      | Edit and validation exits                                               | 11,12,19,105-107                                     |
|             | 14      | Entry from and exit to an application                                   | 67,106,121,122                                       |
|             | 15      | Installation-defined performance record <sup>1</sup>                    | 154                                                  |
|             | 16      | Distributed processing                                                  | 157-163,167,183                                      |

## -START TRACE (DB2)

Table 23 (Page 3 of 3). Classes for DB2 Trace Types

| Trace Type | Class   | Description of Class           | IFCIDs Activated                                                                      |
|------------|---------|--------------------------------|---------------------------------------------------------------------------------------|
|            | 17      | Claim and drain information    | 211-216                                                                               |
|            | 18 - 19 | Reserved                       |                                                                                       |
|            | 20      | Data sharing coherency summary | 249-251,256-257,261,262,267,268                                                       |
|            | 21      | Data sharing coherency detail  | 255,259,263                                                                           |
|            | 22      | Authorization exit parameters  | 314                                                                                   |
|            | 23 - 29 | Reserved                       |                                                                                       |
|            | 30 - 32 | Available for local use        |                                                                                       |
|            | Monitor | 1*                             | Activate the READS IFCIDs                                                             |
|            |         |                                | 1,2,106,124,129,147,148-150, 202, 230,254,306, 316 <sup>2</sup> ,317                  |
|            |         | 2                              | Entry or exit from DB2 event signalling                                               |
|            |         | 3                              | DB2 wait time for I/O, locks; resource usage information                              |
|            |         | 4                              | Installation-defined monitor record <sup>1</sup>                                      |
|            |         | 5                              | Time spent processing IFI requests                                                    |
|            |         | 6                              | Changes to tables created with DATA CAPTURE CHANGES                                   |
|            |         | 7                              | Entry or exit from DB2 event signalling for package and DBRM accounting               |
|            |         | 8                              | Wait time for a package                                                               |
|            |         |                                | 6-9,32,33,44,45,51,52,56,57, 117,118,127,128,170,171,174, 175,213-216,226,227,241-243 |
|            | 9 - 29  | Reserved                       |                                                                                       |
|            | 30 - 32 | Available for local use        |                                                                                       |

### Notes to Table 23:

- An asterisk (\*) indicates a default class for a trace type.
- <sup>1</sup>For instructions on using the IFCIDs, see Appendix D (Volume 2) of *Administration Guide*.
- <sup>2</sup>DB2 does not collect statistical data for this record unless IFCID 318 is activated. IFCID 318 is not associated with any trace class; you must start it on its own.

### IFCID(*ifcid*, ...)

Specifies which other IFCIDs (trace events), in addition to those IFCIDs contained in the classes specified in the CLASS option, are to be started. To start only those IFCIDs specified in the IFCID option, use trace classes 30-32. These classes have no predefined IFCIDs and are available for a location to use. (See 276 for an example of activating only those trace events specified in the IFCID option.)

If you do not specify the IFCID option, only those IFCIDs contained in the activated trace classes are started.



The maximum number of IFCIDs is 156. The range of values that are valid for the IFCID option is 1 through 350, with the exception of: 4, 5, 185, 187, 217, 232, 234, 240, and 241. These exceptions are invalid values for the IFCID option. IFCIDs 4 and 5 are always automatically active. Some of the other invalid IFCIDs can be activated only by certain trace classes. The invalid values for the IFCID option that can be started only by trace classes are:

| To start... | Start...                                                     |
|-------------|--------------------------------------------------------------|
| IFCID 185   | monitor trace class 6                                        |
| IFCID 232   | monitor trace class 2 or 7, or accounting trace class 2 or 7 |
| IFCID 240   | monitor trace class 7 or accounting trace 7                  |
| IFCID 241   | monitor trace class 8 or accounting trace 8                  |

The **default** is **IFCID(\*)**.

#### **BUFSIZE(*k\_bytes*, ...)**

Specifies the size of an IFC managed buffer that receives the trace data. You can specify this option only if you specified an *OPn* destination.

*k\_bytes* can range from 8KB to 1024KB in 4KB increments. If you specify a value outside of this range, then the range limit closest to the specified value is used. To allocate a buffer size of 8KB, you would specify **BUFSIZE(8)**.

The **default** is **BUFSIZE(\*)**, which is the size set when DB2 was installed.

#### **TDATA**

Specifies the product section headers to be placed into the product section of each trace record. If you do not specify TDATA, then the type of trace determines the type of product section header. The product section of a trace record can contain multiple headers.

All IFC records have a standard IFC header. The correlation header is added for accounting, performance, audit, and monitor records. The trace header is added for serviceability records.

#### **CORRELATION**

Places a correlation header on the record.

**Abbreviation:** COR

#### **TRACE**

Places a trace header on the record.

**Abbreviation:** TRA

#### **CPU**

Places a CPU header on the record. The CPU header contains the current processor time for the MVS TCB or SRB executing.

#### **DISTRIBUTED**

Places a distributed header on the record.

**Abbreviation:** DIST

#### **LOCATION(*location-name*, ...)**

Introduces a list of specific location names for which trace information is gathered. The use of the LOCATION option precludes tracing threads that have no distributed data relationship. LOCATION cannot be specified when you want to start a statistics trace.

## -START TRACE (DB2)

### *location-name*

The location names that you supply are the identifiers for the DB2 subsystems whose distributed threads you want to trace. Activates the DB2 trace for the remote TCP/IP or SNA location that you specify by *location-name*.

You can specify up to 8 locations; a separate trace is started for each one. You can specify only one location if you use more than one plan name or authorization ID.

### *<luname>*

Activates the DB2 trace for the remote clients that are connected to DDF through the remote SNA LU name that you specified in *luname*.

### *ipaddr*

Activates the DB2 trace for the remote clients that are connected to DDF through the remote TCP/IP host.*nnn.nnn.nnn* is the dotted decimal IP address.

- (\*) Supplying an asterisk (\*) as the location name indicates that you want to start trace events that occur under distributed threads regardless of which location they are connected to. Specifying the local location name is equivalent to specifying LOCATION(\*).

**Clients Other Than DB2 for OS/390:** DB2 does not receive a location name from clients that are not DB2 for OS/390 subsystems. To start a trace for a client that is not a DB2 for OS/390 subsystem, enter its LUNAME or IP address. Enclose the LUNAME by the less-than (<) and greater-than (>) symbols. Enter the IP address in the form *nnn.nnn.nnn.nnn*. For example, to start a trace for a client with the LUNAME of LULA, enter the following command:

```
-START TRACE (PERFM) CLASS (*) LOCATION (<LULA>)
```

To start a trace for a client with the IP address of 123.34.101.98, enter the following command:

```
-START TRACE (PERFM) CLASS (*) LOCATION (123.34.101.98)
```

## Usage Notes

**Number of Traces:** If you use one or no values for PLAN, AUTHID, or LOCATION, the START TRACE command starts a single trace. If you use multiple values for PLAN, AUTHID, or LOCATION, the command starts a trace for each plan, authorization ID, or location. There can be up to 32 traces going at one time. If a START TRACE command is entered from the console or from the DB2I panels to an OPn or an OPX destination, message DSNW133I is issued to indicate trace data lost.

Using the options PLAN, AUTHID, or LOCATION when starting monitor trace class 1 has no effect on the amount of data returned on IFI READS requests. See Appendix E (Volume 2) of *Administration Guide* for more information on qualifying monitor trace class 1 IFCIDs.

Using the options PLAN, AUTHID, or LOCATION has no effect when starting either accounting or monitor trace classes 2, 5, or 7.

**Stopping and Starting DB2:** If DB2 is stopped and started after you have started a trace, the trace is not restarted automatically.

## Examples

**Example 1:** Start a performance trace for threads with remote activity to location USIBMSTODB21. Only activate IFCIDs 44 (lock suspends) and 54 (lock contention). Trace class 30 is available for installation use.

```
-START TRACE (PERFM)
 DEST(GTF)
 LOCATION(USIBMSTODB21)
 CLASS(30)
 IFCID(44)
```

**Example 2:** Start an accounting trace for plan DSN8BC51. Write records to SMF (that will happen by default). Include a comment to identify the trace.

```
-START TRACE (ACCTG)
 PLAN (DSN8BC51)
 COMMENT ('ACCTG TRACE FOR DSN8BC51')
```

**Example 3:** Start the statistics trace. Write records to SMF (by default).

```
-START TRACE=S
```

**Example 4:** Start monitor tracing (usually done by an application program). Write records to OPX (by default).

```
-START TRACE(MON)
```

## /STOP (IMS)

---

## /STOP (IMS)

The IMS /STOP command (with the SUBSYS parameter) prevents application programs from accessing external subsystem resources.

The following is only a partial description of the /STOP command. For a complete description, see *IMS/ESA Operator's Reference*.

### Environment

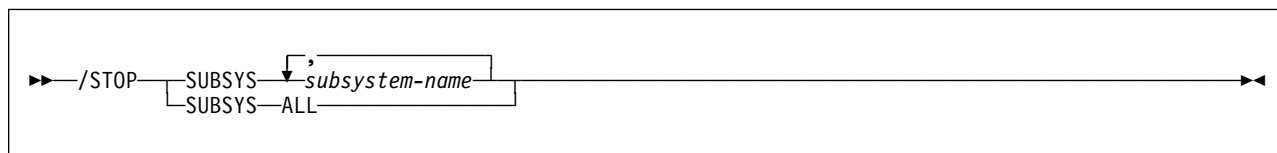
This command can be issued only from an IMS terminal.

**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of IMS authority, as described in the *IMS/ESA Administration Guide: System*.

### Syntax



### Option Descriptions

#### SUBSYS

Specifies whether connection is to be stopped for one or more names of external subsystems presently connected to IMS, or for all of them.

*subsystem-name, ...*

For *subsystem-name*, substitute one or more names of external subsystems whose connection to IMS is to be stopped.

#### ALL

Indicates connection is to be stopped for all external subsystems presently connected to IMS.

### Usage Note

**When to Use /STOP:** The /STOP command allows application programs currently accessing external resources to complete normally. When all applications have terminated, the connection to the external subsystem is also terminated. A /START command must be issued to reestablish the connection.

The /STOP command can also be used to stop the subsystem connection in order to change the specifications in the external subsystem's PROCLIB member entry. The /START command then refreshes the copy in main storage of the PROCLIB entry with the modified entry.

---

## **-STOP DATABASE (DB2)**

The DB2 command STOP DATABASE makes the specified databases unavailable for applications and closes their data sets.

In a data sharing environment, the command applies to every member of the data sharing group. If a GBP-dependent object is stopped with the command STOP DATABASE, DB2 performs the necessary processing to make the object no longer GBP-dependent.

**Abbreviation:** -STO DB

### **Environment**

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group

### **Authorization**

All databases specified for which the set of privileges held by the privilege set of the process has the STOPDB privilege are stopped. Error messages are produced for those databases specified for which this set does not have the STOPDB privilege. The privilege set of the process must include one of the following:

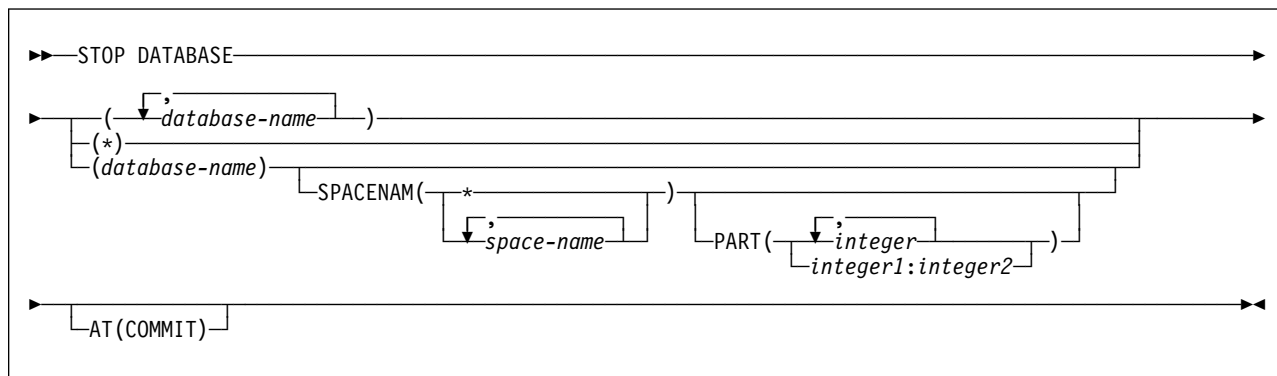
- STOPDB privilege
- DBMAINT, DBCTRL, or DBADM authority
- SYSCTRL or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

When data definition control is active, installation SYSOPR or installation SYSADM authority is required to stop the database, a table space, or an index space containing a registration table or index.

Database DSNDB06 contains the table spaces and index spaces required to check authorization. If you stop any table space or index space required for the START DATABASE authorization check, then installation SYSADM authority is required to restart it.

## Syntax



## Option Descriptions

One of the following two options is required.

(\*) Stops all databases for which the privilege set of the process has at least DBMAINT authority.

However, DSNDB01, DSNDB06, and work file databases, such as DSNDB07, can be stopped only by explicitly specifying them (for example, STOP DATABASE(DSNDB01)).

(*database-name, ...*)

Specifies the names of the databases to stop. If you use more than one name, separate names in the list by commas.

(*database-name*)

Specifies the name of the database to stop. Only one database can be named with the SPACENAM option.

**SPACENAM**(*space-name, ...*)

Indicates names of table spaces or indexes within the specified database to stop.

**Abbreviation:** SPACE

(\*) Stops all table spaces and indexes of the specified database. You cannot use this parameter with more than one database name.

*space-name*

Is the name of a table space or index space to stop. See "Usage Notes," below, for instructions on how to start them again.

You cannot use this parameter if you use more than one database name or if you use (\*).

**PART**(*integer*)

Indicates the partition number of one or more partitions, within the specified table space or index, that are to be stopped. The START or STOP state of other partitions does not change.

The *integer* specified must identify a valid partition number for the corresponding space name and database name. If you specify nonvalid

partition numbers, you receive an error message for each nonvalid number, but all valid partitions that you specified are stopped.

*integer* can be written to designate either:

- A list of one or more partitions, or
- A range of all partition numbers that collate greater than or equal to *integer1* and less than or equal to *integer2*

Both a list and a range cannot be specified.

PART is valid with partitioned table spaces, partitioned indexes, and nonpartitioned type 2 indexes of partitioned table spaces. If you specify PART with a nonpartitioned table space or index on a nonpartitioned table space, you receive an error message, and the nonpartitioned space is not stopped. When a logical partition is stopped, the index is not closed. A nonpartitioned index must be stopped without the use of PART to close the index.

#### **AT(COMMIT)**

Marks the specified object as being in STOPP status to prevent access from new requesters. Currently running applications are allowed to continue access until their next commit. After commit, further access by the committing application is prohibited. The object is actually stopped when all jobs release their claims on it and all utilities release their drain locks on it. Specify AT(COMMIT) to break in on threads that are bound with RELEASE(DEALLOCATE), especially in situations where there is high thread reuse.

## **Usage Notes**

***Explicitly Stopped Databases:*** If table spaces and indexes are stopped explicitly (using the STOP DATABASE command with the SPACENAM option), they must be started explicitly using the START DATABASE command. Starting the database does not start table spaces or indexes that have been stopped explicitly.

***Stopped Table Spaces:*** Table spaces, indexes, and partitions are physically closed when the STOP DATABASE command is issued, except for logical partitions of a nonpartitioned index of a partitioned table space.

***Operation in TSO, MVS, and Batch:*** When the STOP DATABASE command is issued from a TSO or an MVS console, the command operates asynchronously to keep the terminal free. When the command is issued from a batch job, it operates synchronously in case later steps depend on the database being stopped. The STOP DATABASE command drains work in progress on the database before stopping it. If it cannot get the drain locks on the first request, it repeatedly tries again. The command fails if it times out more than 15 times trying to get the locks or if a serious deadlock situation occurs.

***Ensuring That All Databases Are Stopped:*** When the STOP DATABASE command is processing asynchronously, message DSN9022I might be issued before the command completes. Message DSNT736I is issued to indicate that the asynchronous processing of the STOP DATABASE command is complete.

Use the DISPLAY DATABASE command to check the stopped status of table spaces and indexes in a database. A status of STOPP indicates that the object is in the process of being stopped. A status of STOP indicates that the stop has com-

## -STOP DATABASE (DB2)

pleted and the object is in a stopped state. An object is not stopped until all currently active threads accessing the object are quiesced.

**Databases DSNDDF and DSNRLST:** If the communication database (CDB) and the resource limit database (RLST) are active, they cannot be stopped. Those databases are active when created and are activated by DB2. For more information on the CDB, see Section 1 (Volume 1) of *Installation Guide*, and for the RLST, see Section 5 (Volume 2) of *Administration Guide*.

**Stopping DSNDB01:** If you try to stop the DSNDB01 database while an application plan or package is executing, you might receive a time out because of locking contention on DSNDB01. This is most likely to occur when an application plan or package is executing for the first time since DB2 was started, or if the skeleton cursor table (SKCT) for the plan or the skeleton package table (SKPT) for the package was swapped out of the EDM pool.

**Table Space in a Restrictive Status:** If an application process requests a transaction lock on a table space that is in a restrictive status (RECP, PSRCP) or has a required index in a restrictive status, DB2 acquires the lock and does not detect the status until the application tries to access the table space or index. The application then receives SQLCODE -904 ("resource not available") and should release the lock, either by committing or rolling back (if the value of the RELEASE option is COMMIT) or by ending (if the value of RELEASE is DEALLOCATE). If you issue the command STOP DATABASE for either the table space or the index space while a transaction lock is in effect, the command is suspended. It repeatedly tries to get the locks needed to drain the work in progress before stopping the database. If the command times out more than 15 times trying to get the locks, it fails.

**After a DASD Failure:** Issuing the STOP DATABASE command before interrupting the I/O interface between the failed device and DB2 can result in incomplete I/O requests. To prevent this hang situation, create an interruption either by forcing the device offline using the MVS command VARY with the FORCE option, or by setting the I/O timing interval for the device before any failures. You can set the I/O timing interval through the IECIOSxx MVS parmlib member or by issuing the MVS command:

```
SETIOS MIH,DEV=dddd,IOTIMING=mm:ss
```

## Examples

**Example 1:** Stop table space DSN8S51E in database DSN8D51A and close the data sets that belong to that table space.

```
-STOP DATABASE(DSN8D51A) SPACENAM(DSN8S51E)
```

**Example 2:** Stop all databases (except DSNDB01, DSNDB06, and work file databases)

```
-STOP DATABASE(*)
```

**Example 3:** Stop all databases (except DSNDB01, DSNDB06, and work file databases) when all jobs release their claims and all utilities release their drain locks.

```
-STOP DATABASE(*) AT(COMMIT)
```

**Example 4:** Stop the first partition of XEMP2, a nonpartitioned index of a partitioned table space in database DSN8D51A. Partition 1 is logically stopped and



## **-STOP DATABASE (DB2)**

cannot be accessed by applications; however, no data sets are closed because parts of a nonpartitioned index are not associated with separate physical data sets.

```
-STOP DATABASE(DSN8D51A) SPACENAM(XEMP2) PART(1)
```

## -STOP DB2 (DB2)

---

## -STOP DB2 (DB2)

The DB2 command STOP DB2 stops the DB2 subsystem.

**Abbreviation:** -STO DB2

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- STOPALL privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

#### MODE

Tells whether currently executing programs will be allowed to complete. For the effects of this option on distributed threads, see the description of the MODE option of 258.

#### (QUIESCE)

Allows currently executing programs to complete processing. No new program is allowed to start.

The **default** is **MODE(QUIESCE)**.

#### (FORCE)

Terminates currently executing programs, including utilities. No new program is allowed to start. MODE(FORCE) will probably cause indoubt situations. Some tasks, such as stored procedures tasks and DB2 service tasks, terminate abnormally. When they terminate abnormally, you might see dumps and messages from these failures.

## Usage Notes

**MODE(QUIESCE):** If MODE(QUIESCE) is used, all connected address spaces must terminate all connections before the DB2 subsystem stops. The system operator can tell whether any connections remain by using the DISPLAY THREAD command, and can cancel them by using the DB2 CANCEL command or MVS commands.

**MODE(FORCE):** A forced stop does not cause an immediate abend. If a connected task is executing outside DB2, DB2 posts an exit to stop the task from accessing DB2. If a task is executing in DB2, it stops when the next “suspend” or “execution unit switch” occurs. In some cases, the delay before stopping can be significant.

## Example

**Example:** Stop the DB2 subsystem. Allow currently active programs to complete. Do not allow new programs to identify to DB2.

```
-STOP DB2 MODE (QUIESCE)
```

## -STOP DDF (DB2)

---

## -STOP DDF (DB2)

The DB2 command STOP DDF stops the distributed data facility (DDF) if it has already been started and is used to terminate the DDF interface to VTAM or TCP/IP.

**Abbreviation:** -STO DDF

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

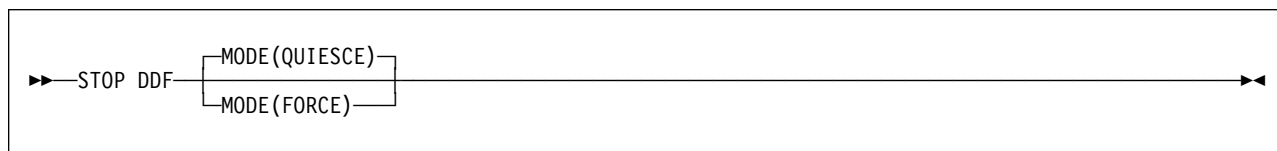
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax



### Option Descriptions

#### MODE

Tells whether currently executing active distributed threads are allowed to complete.

#### (QUIESCE)

Allows active distributed threads that are using DDF to complete normally and terminates only inactive distributed threads. If DDF THREADS ACTIVE was specified during DB2 installation, all DDF threads are active threads.

The **default** is **MODE (QUIESCE)**.

#### (FORCE)

Terminates all currently executing distributed threads.

Some tasks, such as stored procedures tasks and DB2 service tasks, terminate abnormally. When they terminate abnormally, you might see dumps and messages from these failures.

## Usage Notes

**MODE(QUIESCE):** If MODE(QUIESCE) is used, all distributed activity must complete before DDF stops. The operator can tell whether any distributed threads remain by using -DISPLAY THREAD with the LOCATION option. To cancel distributed threads that are preventing DDF from stopping, see “Usage Notes” on page 82 for -CANCEL THREAD. or use STOP DDF MODE(FORCE).

MODE(QUIESCE) forces any inactive threads to terminate. A requesting system that is using two-phase commit on an inactive thread might report the terminated thread as indoubt at the system that issued STOP DDF. The thread is not actually indoubt (there is no commit or rollback pending) and the condition is resolved when DDF is restarted.

**MODE(FORCE):** If MODE(FORCE) is used, the DB2 connection to VTAM or TCP/IP terminates. The termination forces all VTAM or TCP/IP requests to complete immediately, indicating that a communications error has occurred and DDF has stopped. A forced stop could take as long as three minutes to complete.

If any applications are updating remote servers using two-phase commit, then MODE(FORCE) might create indoubt threads at each server.

## Examples

**Example 1:** Stop the distributed data facility (MODE QUIESCE).

```
-STOP DDF
```

**Example 2:** Stop the distributed data facility (MODE FORCE).

```
-STOP DDF MODE(FORCE)
```

## STOP ...(MVS IRLM)

---

### STOP irlmproc (MVS IRLM)

The STOP *irlmproc* command shuts IRLM down normally. The command is rejected if any active DB2 subsystems are currently identified to IRLM.

**Abbreviation:** P

#### Environment

This command can be issued only from an MVS console.

**Data Sharing Scope:** Member

#### Authorization

The command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

#### Syntax

```
▶—STOP—irlmproc—▶
```

#### Parameter Description

*irlmproc*

Identifies the procedure name for the IRLM to be stopped.

#### Usage Note

**Terminating the irlmproc:** If IRLM does not shut down normally, issue the MODIFY *irlmproc*,ABEND command to terminate the IRLM abnormally. If there are outstanding DB2 requests in process and IRLM will not terminate, use the MVS CANCEL command. If all other means of removing the subsystem fail, issue the MVS FORCE CANCEL command:

```
F irlmproc,ABEND,DUMP
```

#### Example

**Example:** Enter on the MVS1 system console:

```
P KRLM001
```

IRLM 2.1 responses on MVS1 system console:

```
DXR165I IR21001 TERMINATED VIA IRLM MODIFY COMMAND
DXR121I IR21001 END-OF-TASK CLEANUP SUCCESSFUL - HI-CSA 325K
```

Response on MVS2 system console:

```
DXR025I JRLM001 SESSION LOST, SHARING STATE IS IRLM FAILED
```

|                    *Explanation:*

#                    The operator on system 1 has terminated the IRLM procedure named KRLM001 .  
                      The operator on system 2 is informed that the IRLM in system 1 has terminated,  
                      but no operator action on system 2 is required.

|                    *Note when in a data sharing environment:* In IRLM2.1, you cannot issue the P  
|                    command to IRLM in a data sharing group until there are no DB2 identified and the  
|                    IRLM has issued the following messages:

|                    DXR136I IR21 HAS DISCONNECTED FROM THE DATA SHARING GROUP

                      Any members still active in the group issue:

                      DXR137I JR21 GROUP STATUS CHANGED. IR21 233 HAS BEEN DISCONNECTED  
                      FROM THE DATA SHARING GROUP

## -STOP PROCEDURE (DB2)

---

## -STOP PROCEDURE (DB2)

The DB2 command STOP PROCEDURE prevents DB2 from accepting SQL CALL statements for one or more stored procedures. This command does not prevent CALL statements from running if they have already been queued or scheduled by DB2.

If the DB2 established stored procedure address space is connected to DB2, MVS stops it based on the syntax of the STOP PROCEDURE command. The command can succeed even if a procedure named is not listed in the catalog table SYSIBM.SYSPROCEDURES.

DB2 implicitly issues the command STOP PROCEDURE ACTION(REJECT) for any stored procedure that exceeds the maximum abend count. That count is set by the MAX ABEND COUNT field of installation panel DSNTIPX.

**Abbreviation:** -STO PROC

## Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

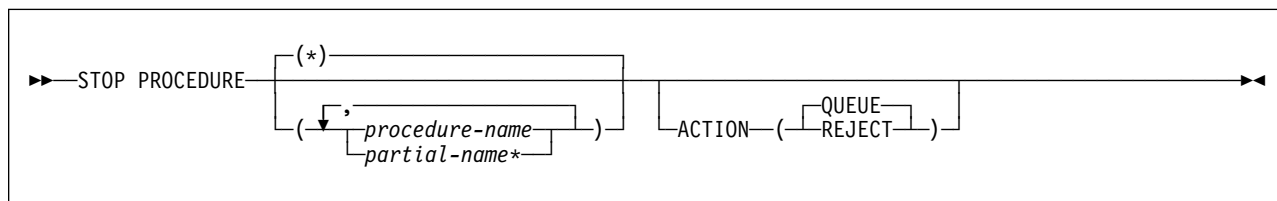
## Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

*procedure-name*

Lists one or more stored procedure names to be stopped. If no procedures are named, all stored procedures are stopped, and the DB2-established stored procedures address space is terminated.



*partial-name\**

Stops a set of stored procedures. The names of all procedures in the set begin with *partial-name* and can end with any string, including the empty string. For example, ABC\* stops all stored procedures with names that begin with ABC.

- (\*) Stops access to all stored procedures, including procedure definitions that have not yet been accessed by DB2 applications. The stored procedures address space terminates after active work is complete.

**ACTION**

Tells what to do with a CALL statement that is received while the procedure is stopped. If STOP PROCEDURE is issued more than once for a given procedure, the action taken is determined by the ACTION option on the most recent command.

**(QUEUE)** Queues the request until either:

- The wait exceeds the installation timeout value, or
- The stored procedure is started by the command START PROCEDURE.

This is the default.

**(REJECT)** Rejects the request

## Usage Notes

**Permanently Disabling a Stored Procedure:** A stopped procedure does not remain stopped if DB2 is stopped and restarted. To disable a stored procedure permanently, you can:

- Delete the row in SYSIBM.SYSPROCEDURES that defines the procedure
- Update the row so that the LOADMOD column names a nonexistent MVS load module
- Rename or delete the MVS load module

**Stored Procedure Address Space Management Differences:** The STOP PROCEDURE command operates differently depending upon how the DB2 stored procedures address spaces are established. For more information, see Section 4 (Volume 1) of *Administration Guide*.

## Examples

**Example 1:** Stop access to all stored procedures, and terminate the DB2 stored procedures address space. While the -STOP PROCEDURE command is in effect, attempts to execute stored procedures are queued.

```
-STOP PROCEDURE ACTION(QUEUE)
DSNX947I STOP PROCEDURE SUCCESSFUL FOR *
```

**Example 2:** Stop access to all stored procedures, and terminate the DB2 stored procedures address space. While the -STOP PROCEDURE command is in effect, attempts to execute stored procedures are rejected.

```
-STOP PROCEDURE ACTION(REJECT)
DSNX947I STOP PROCEDURE SUCCESSFUL FOR *
```

## -STOP PROCEDURE (DB2)

**Example 3:** Stop stored procedures USERPRC1 and USERPRC3. While the -STOP PROCEDURE command is in effect, attempts to execute these stored procedure are queued.

```
-STOP PROCEDURE(USERPRC1,USERPRC3)
```

```
DSNX947I STOP PROCEDURE SUCCESSFUL FOR USERPRC1
```

```
DSNX947I STOP PROCEDURE SUCCESSFUL FOR USERPRC3
```

**Example 4:** Stop stored procedures USERPRC1 and USERPRC3. While the -STOP PROCEDURE command is in effect, attempts to execute these stored procedure are rejected.

```
-STOP PROCEDURE(USERPRC1,USERPRC3) ACTION(REJECT)
```

```
DSNX947I STOP PROCEDURE SUCCESSFUL FOR USERPRC1
```

```
DSNX947I STOP PROCEDURE SUCCESSFUL FOR USERPRC3
```

---

## -STOP RLIMIT (DB2)

The DB2 command STOP RLIMIT stops the resource limit facility. -STOP RLIMIT resets all previously set limits to infinity and resets the accumulated time to zero. All previously limited SQL statements (SELECT, UPDATE, DELETE, and INSERT) executed through an SQL PREPARE or EXECUTE IMMEDIATE statement run with no limit.

**Abbreviation:** -STO RLIM

### Environment

This command can be issued from an MVS console, a DSN session under TSO, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

### Authorization

To execute this command, the privilege set of the process must include one of the following:

- SYSOPR authority
- SYSCTRL authority
- SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

### Syntax

```
▶▶—STOP RLIMIT—◀◀
```

### Example

**Example:** Stop the resource limit facility.

```
-STOP RLIMIT
```

---

### -STOP TRACE (DB2)

The DB2 command STOP TRACE stops tracing.

There is an additional option to this command and values for a few options that are not described here. They are intended for service and use under the direction of IBM support personnel. For details, see *Diagnosis Guide and Reference*.

**Abbreviation:** -STO TRA

### Environment

This command can be issued from an MVS console, a DSN session, a DB2I panel (DB2 COMMANDS), an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Member

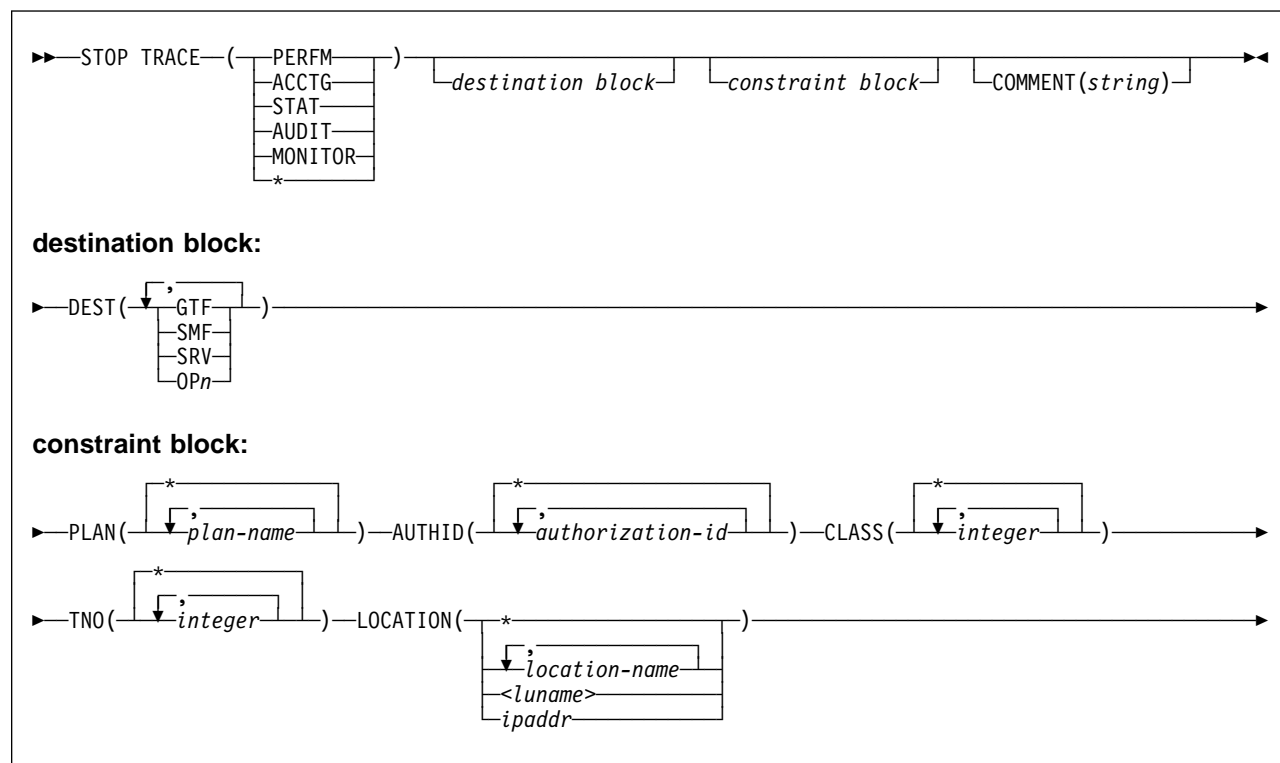
### Authorization

To execute this command, the privilege set of the process must include one of the following:

- TRACE privilege
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

## Syntax



## Option Descriptions

Each option that you use, except TNO, limits the effect of the command to active traces that were started using the same option, either explicitly or by default, with exactly the same parameter values. For example, the command

```
-STOP TRACE (PERFM) CLASS (1,2)
```

stops only the active traces that were started using the options PERFM *and* CLASS (1,2); it does *not* stop, for example, any trace started using CLASS(1).

You must specify a trace type or an asterisk. For example, the following command stops all active traces:

```
-STOP TRACE (*)
```

When stopping trace classes, a special circumstance occurs if monitor trace class 6 is active. Monitor trace class 6 enables and disables data propagation. To avoid accidentally stopping this trace class, the commands -STOP TRACE(\*) and -STOP TRACE(MON) CLASS(\*) fail if monitor trace class 6 is active.

To stop monitor trace class 6, you must explicitly specify it as one of the arguments of the CLASS option of the -STOP TRACE command, including any other monitor trace classes that were started with monitor trace class 6. For example, if monitor trace class 6 was started with the command -START TRACE(MON) CLASS(1,3,6), the following command stops it:

```
-STOP TRACE(MON) CLASS(1,3,6)
```

## -STOP TRACE (DB2)

In the case where monitor trace class 6 was started with the command -START TRACE(MON) CLASS(\*), you must explicitly specify all 32 monitor trace classes to have monitor trace class 6 stopped:

```
-STOP TRACE(MON) CLASS(1,2,3,4,5,6,...32)
```

However, if monitor trace class 6 is not active the -STOP TRACE(\*) command stops all active traces.

Each of the following keywords limits the command to stopping traces of the corresponding type. For further descriptions of each type, see “-START TRACE (DB2)” on page 268.

Table 24. Trace Types

| Type    | Description                             | Abbreviation |
|---------|-----------------------------------------|--------------|
| PERFM   | Performance records of specific events  | P            |
| ACCTG   | Accounting records for each transaction | A            |
| STAT    | Statistical data                        | S            |
| AUDIT   | Audit data                              | AU           |
| MONITOR | Monitor data                            | MON          |

### COMMENT(*string*)

Gives a comment that is reproduced in the trace output record for the STOP TRACE command (except in the resident trace tables).

*string* is any SQL string; it must be enclosed between apostrophes if it includes a blank, comma, or special character.

### DEST

Limits stopping to traces started for particular destinations. You can use more than one value, but do not use the same value twice. If you do not specify a value for DEST, DB2 does not use destination to limit which traces to stop.

**Abbreviation:** D

Possible values and their meanings are:

| Value       | Trace destination                                           |
|-------------|-------------------------------------------------------------|
| GTF         | The generalized trace facility                              |
| SMF         | The System Management Facility                              |
| SRV         | An exit to a user-written routine                           |
| OP <i>n</i> | A specific destination. <i>n</i> can be a value from 1 to 8 |

See “-START TRACE (DB2)” on page 268 for a list of allowable destinations for each trace type.

### PLAN(*plan-name, ...*)

Limits stopping to traces started for particular application plans. You can use up to eight plan names. If you use more than one name, you can use only one value for AUTHID, TNO, and LOCATION. Do not use this option with STAT.

The **default** is **PLAN )**, which does not limit the command.

### AUTHID(*authorization-id, ...*)

Limits stopping to traces started for particular authorization identifiers. You can use up to eight identifiers. If you use more than one identifier, you can use only one value for PLAN, TNO, and LOCATION. Do not use this option with STAT.

The **default** is **AUTHID( )**, which does not limit the command.

**CLASS(integer, ...)**

Limits stopping to traces started for particular classes. For descriptions of the allowable classes, see “-START TRACE (DB2)” on page 268. You cannot specify a class if you did not specify a trace type.

**Abbreviation:** C

The **default** is **CLASS( )**, which does not limit the command.

**TNO(integer, ...)**

Limits stopping to particular traces, identified by their trace numbers (1 to 32, 01 to 09). You can use up to eight trace numbers. If you use more than one number, you can use only one value each for PLAN, AUTHID, and LOCATION.

The **default** is **TNO( )**, which does not limit the command.

**LOCATION(location-name, ...)**

Introduces a list of specific location names for which traces are stopped. Limits the traces you can stop to those started for threads with connections to remote locations; the use of the LOCATION option precludes stopping traces of non-distributed threads.

You can specify up to eight location names. If you use more than one location name, you can only use one value for PLAN, AUTHID, and TNO. You cannot use this option with STAT.

The **default** is **LOCATION()**, which does not limit the command.

(\*) **LOCATION(\*)** limits the command to those traces that were started with the one or more location names specified on the LOCATION keyword of -START TRACE.

*<luname>*

Stops the DB2 trace for the remote clients that are connected to DDF through the remote SNA LU that you specify in *<luname>*.

*ipaddr*

Stops the DB2 trace for remote clients that are connected to DDF through the remote TCP/IP host. *nnn.nnn.nnn.nnn* is the dotted decimal IP address.

**Requesters Other Than DB2 for OS/390:** DB2 does not receive a location name from requesters that are not DB2. To display information about a requester that is not a DB2 for OS/390 subsystem, enter its LUNAME, enclosed by the less-than (<) and greater-than (>) symbols. For example, to display information about a requester with the LUNAME of LULA, enter the following command:

```
-STOP TRACE (*) LOCATION (<LULA>)
```

DB2 uses the <LUNAME> notation in messages displaying information about requesters that are not DB2 for OS/390.

|  
|  
|

## -STOP TRACE (DB2)

### Usage Notes

**Traces started by a IFI/IFC program:** Before you stop an active trace, ensure that an IFI application program or the IFC Selective Dump utility (DSN1SDMP) did not start the trace. If you stop a trace started by DSN1SDMP, the DSN1SDMP utility abnormally terminates.

### Examples

**Example 1:** Stop all traces that have the generalized trace facility as their only destination.

```
-STOP TRACE (*) DEST (GTF)
```

**Example 2:** Stop an accounting trace of all threads between the local and USIBMSTODB21 DB2 subsystems for plan DSN8BC51. Include a comment.

```
-STOP TRACE (ACCTG)
 PLAN (DSN8BC51)
 LOCATION (USIBMSTODB21)
 COMMENT('ACCTG TRACE FOR DSN8BC51')
```

**Example 3:** Stop trace number 4.

```
-STOP TRACE (P) TNO(4)
```

**Example 4:** Stop all active traces of any type for USIBMSTODB22.

```
-STOP TRACE (*) LOCATION (USIBMSTODB22)
```

**Example 5:** Stop all performance traces.

```
-STOP TRACE=P
```

**Example 6:** Stop all monitor tracing.

```
-STOP TRACE(MON)
```



## -TERM UTILITY (DB2)

The DB2 command TERM UTILITY terminates execution of a DB2 utility job step and releases all resources associated with the step. When executing, a utility does not terminate until it checks to see that -TERM was issued. Active utilities perform this check periodically. If the utility is stopped, all its resources are released by -TERM. An active utility can be terminated only from the DB2 on which it is running. A stopped utility can be terminated from any active member of the data sharing group.

**Abbreviation:** -TER UTIL

## Environment

This command can be issued from an MVS console, a DSN session, DB2I panels DB2 COMMANDS and DB2 UTILITIES, an IMS or CICS terminal, or a program using the instrumentation facility interface (IFI).

**Data Sharing Scope:** Group or member. The utility is implicitly of group scope when the utility is stopped.

## Authorization

To execute this command, the primary or some secondary authorization ID of the process must be the ID that originally submitted the utility job, or the privilege set of the process must include one of the following:

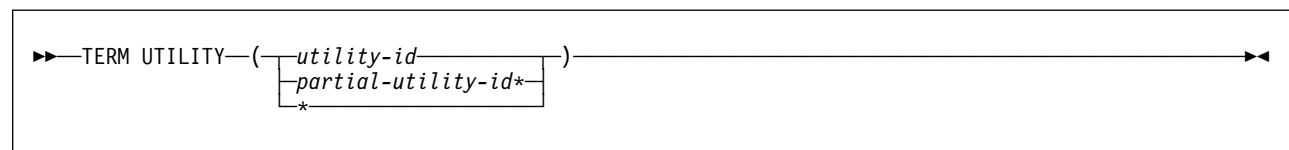
- DBMAINT, DBCTRL, or DBADM authority
- SYSOPR, SYSCTRL, or SYSADM authority

DB2 commands issued from an MVS console are not associated with any secondary authorization IDs.

For users with DBMAINT, DBCTRL, or DBADM authority, the command takes effect only when it can be determined that the user has sufficient authority over each object that the utility job accesses.

Database DSNDB06 contains the table spaces and index spaces required to check authorization. If a table or index space required for authorization checking is affected by a utility which you need to terminate, then installation SYSADM authority is required to terminate that utility.

## Syntax



## Option Descriptions

One of the following parameters must be specified.

**(utility-id)**

Is the utility identifier, or the UID parameter used when creating the utility job step.

If *utility-id* was created by the DSNU CLIST by default, it has the form *tso-userid.control-file-name*. For the control file name that is associated with each utility, see the description of the DSNU utility in *Utility Guide and Reference*.

If *utility-id* was created by default by the EXEC statement invoking DSNUUTILB, then the token has the form *userid.jobname*.

**(partial-utility-id\*)**

Terminates every utility job that begins with *partial-utility-id*. For example, -TERM UTILITY(ABCD\*) terminates every utility job step whose utility identifier begins with the letters ABCD. If you have a two-part utility ID, such as ABCD.EFGH, -TERM UTILITY(ABCD\*) also terminates that utility.

(\*) Terminates every utility job step known to DB2 for which you are authorized.

## Usage Notes

**Restarting Utilities:** A terminated utility job step cannot be restarted. You must resubmit the step as a new utility job.

**What Happens to Particular Utilities:** In some cases, terminating a utility job can leave work in an undesirable state, requiring special processing before the job can be resubmitted. The following list describes the effects of -TERM on jobs for each of the utilities:

| Utility          | Special Effects of -TERM                                                                                                       |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|
| CATMAINT         | None                                                                                                                           |
| CATMAINT CONVERT | Places catalog and directory indexes in recovery pending status                                                                |
| CHECK DATA       | None                                                                                                                           |
| CHECK INDEX      | None                                                                                                                           |
| COPY             | Inserts "T" record in SYSIBM.SYSCOPY. When you run COPY, it does not allow an incremental image copy if the "T" record exists. |
| DIAGNOSE         | None                                                                                                                           |
| LOAD             | See <i>Utility Guide and Reference</i> for the effect of -TERM on the LOAD utility phases                                      |
| MERGECOPY        | None                                                                                                                           |
| MODIFY           | None                                                                                                                           |
| QUIESCE          | None                                                                                                                           |
| RECOVER INDEX    | Places the object being recovered in recovery pending status                                                                   |

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| RECOVER TABLESPACE | Places the object being recovered in recovery pending status                               |
| REORG              | See <i>Utility Guide and Reference</i> for the effect of -TERM on the REORG utility phases |
| REPAIR             | None                                                                                       |
| REPORT             | None                                                                                       |
| RUNSTATS           | None                                                                                       |
| STOSPACE           | None                                                                                       |

## Examples

**Example 1:** Terminate all utility jobs for which you are authorized.

```
-TERM UTILITY (*)
```

**Example 2:** Terminate all utility jobs whose utility ID begins with SMITH.

```
-TERM UTILITY
(SMITH*)
```

---

## /TRACE (IMS)

The IMS /TRACE command directs and controls the IMS capabilities for tracing internal IMS events. It also starts, stops, and defines the activity to be monitored by the IMS DC Monitor.

**Abbreviation:** /TRA

### Environment

This command can be issued only from an IMS terminal.

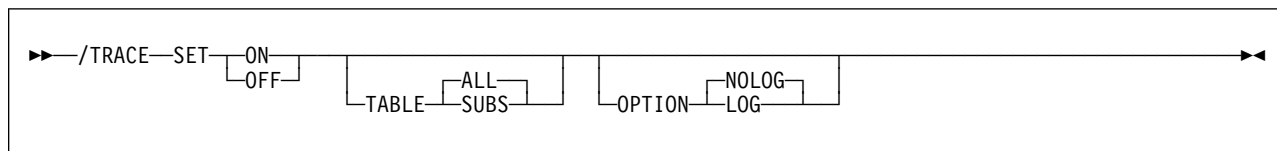
**Data Sharing Scope:** Member

### Authorization

To enter this command, users must have passed the IMS security check, as described in *IMS/ESA Administration Guide: System*.

The syntax diagram below includes only those parameters that DB2 users need to know. For a diagram with the complete syntax of this command, see *IMS/ESA Operator's Reference*.

### Syntax



### Option Descriptions

The option descriptions for the /TRACE command are described in *IMS/ESA Operator's Reference*; however, this section provides information about the two parameters that are especially important for DB2 users.

#### SUBS

This parameter follows the TABLE keyword. It indicates that the external sub-system trace table (containing information about every interaction with DB2) is to be enabled or disabled. SET ON TABLE SUBS enables the DB2 trace facility, and SET OFF TABLE SUBS disables it.

If nothing is specified with the TABLE keyword, then the default is ALL; ALL includes SUBS, as well as other trace tables.

#### LOG

This parameter follows the OPTION keyword (which follows the TABLE keyword parameter) to specify that traced data is written to the IMS system log. Because IMS has a tracing mechanism that writes trace entries to the IMS system log, it is important that DB2 users specify SET ON and TABLE OPTION LOG. Otherwise, the trace information that IMS provides will not be available unless a control region dump occurs.

## Examples

**Example 1:** This command starts IMS tracing and:

- Enables the DB2 trace
- Writes IMS trace tables to the IMS log before they wrap.

```
/TRACE SET ON TABLE SUBS OPTION LOG
```

**Example 2:** This command starts IMS tracing and:

- Enables all trace tables (including DB2's); (ALL is the default parameter for the TABLE keyword)
- Writes IMS trace tables to the IMS log before they wrap.

```
/TRACE SET ON TABLE ALL OPTION LOG
```

## TRACE CT (MVS IRLM)

The MVS command TRACE CT starts, stops, or modifies a diagnostic trace for the internal resource lock manager (IRLM) of DB2. IRLM does not support all the options available on the TRACE command as described in *MVS/ESA System Commands*.

### Environment

This command can be issued only from an MVS console.

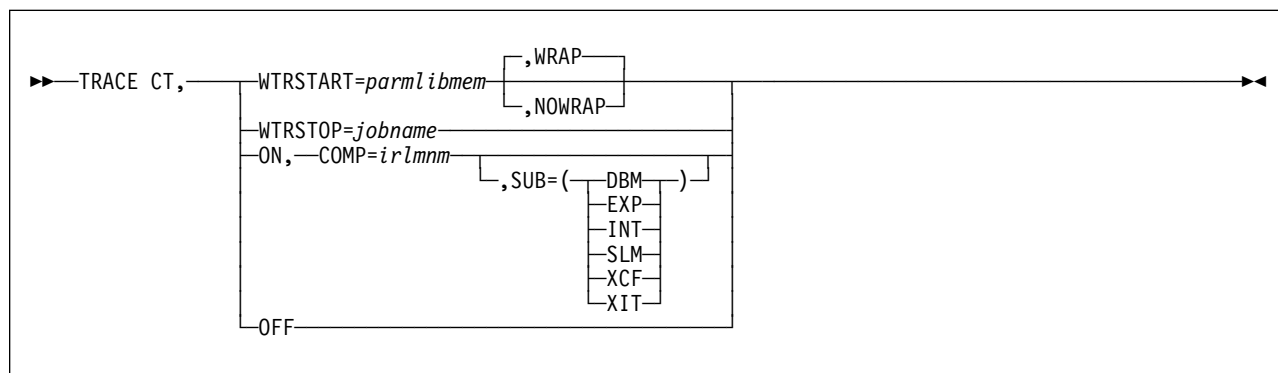
**Data Sharing Scope:** Member

### Authorization

This command requires an appropriate level of MVS authority, as described in *MVS/ESA System Commands*.

The syntax diagram and option descriptions for this command are purposely incomplete. Options that are not shown are described in *MVS/ESA System Commands*.

### Syntax



### Option Descriptions

#### CT

Specifies the component trace. (Do not use other trace options available on the MVS TRACE command).

#### WTRSTART=parmlibmem

Identifies the member that contains source JCL. That JCL executes the CTRACE writer and defines the data set to which it writes the trace buffers. This member can be a procedure cataloged in SYS1.PROCLIB or a job.

#### WRAP

Specifies that when the system reaches the end of the group of data sets, it writes over the oldest data at the beginning of the first data set in the group. The system uses only the primary extents of the data sets.

**NOWRAP**

Specifies that the system stops writing to the data sets when they are all full. The system uses the primary and secondary extents of the data sets.

**WTRSTOP=jobname**

Stops the CTRACE writer for a trace that is running. The system also closes the data sets that the writer used.

*jobname* identifies the trace, either by:

- Member name, if the source JCL is a procedure
- Job name, if that appears on a JOB statement in the source JCL

**ON**

Turns on the trace.

**COMP=irlmssnm**

Gives the IRLM subsystem name.

**SUB=subname**

Specifies the type of sublevel trace. Traces INT, EXP, and XIT are ON by default. You cannot turn off traces INT and EXP. If you do not specify a subname on the TRACE command, the trace is performed on all subnames that you control. Specifying one subname restricts the traces to that trace plus the EXP and INT traces.

**Use: To trace:**

|     |                                                               |
|-----|---------------------------------------------------------------|
| DBM | Interactions with the identified DBMS                         |
| EXP | Any exception condition                                       |
| INT | Member and group events outside normal locking activity       |
| SLM | Interactions with the MVS locking component                   |
| XCF | All interactions with MVS cross-system coupling services      |
| XIT | Only asynchronous interactions with the MVS locking component |

**OFF**

Turns off the trace. If IRLM is connected to a CTRACE writer for the component trace, the system disconnects it.

## Usage Notes

**Include the IRLM Load Module in the MVS Link List:** This command uses MVS component trace services. Include the IRLM load module DXRRL183, which contains a routine for stopping and starting, in the MVS link list.

**Displaying a Trace:** To display a trace, use the MVS DISPLAY command:

#

```
D TRACE,COMP=IRLM001
```

**Monitoring a Trace:** To monitor a trace, use the MVS MODIFY irlmproc,STATUS,TRACE command on page 215.

**Setting the Number of Trace Buffers:** To set the number of trace buffers used by traces, use the MVS MODIFY irlmproc,SET command on page 213.

**Sample Procedure for the CTRACE Writer:** This procedure identifies the data set to which the next sample procedure writes data.





## Glossary

The following terms and abbreviations are defined as they are used in the DB2 library. If you do not find the term you are looking for, refer to the index or to *Dictionary of Computing*.

### A

**abend.** Abnormal end of task.

**abend reason code.** A 4-byte hexadecimal code that uniquely identifies a problem with DB2. A complete list of DB2 abend reason codes and their explanations is contained in *Messages and Codes*.

**access method services.** A utility program that defines and manages VSAM data sets (or files).

**access path.** The path used to get to data specified in SQL statements. An access path can involve an index or a sequential search.

**active log.** The portion of the DB2 log to which log records are written as they are generated. The active log always contains the most recent log records, whereas the archive log holds those records that are older and no longer will fit on the active log.

**active member state.** A state of a member of a data sharing group. An active member is identified with a group by XCF, which associates the member with a particular task, address space, and MVS system. A member that is not active is failed or quiesced.

**address space.** A range of virtual storage pages identified by a number (ASID) and a collection of segment and page tables which map the virtual pages to real pages of the computer's memory.

**address space connection.** The result of connecting an allied address space to DB2. Each address space containing a task connected to DB2 has exactly one address space connection, even though more than one task control block (TCB) can be present. See *allied address space* and *task control block*.

**alias.** An alternate name that can be used in SQL statements to refer to a table or view in the same or a remote DB2 subsystem.

**allied address space.** An area of storage external to DB2 that is connected to DB2 and is therefore capable of requesting DB2 services.

**allied thread.** A thread originating at the local DB2 subsystem that may access data at a remote DB2 subsystem.

**ambiguous cursor.** A database cursor that is not defined with either the clauses FOR FETCH ONLY or FOR UPDATE OF, is not defined on a read-only result table, is not the target of a WHERE CURRENT clause on an SQL UPDATE or DELETE statement, and is in a plan or package that contains SQL statements PREPARE or EXECUTE IMMEDIATE.

**American National Standards Institute (ANSI).** An organization consisting of producers, consumers, and general interest groups, that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States.

**ANSI.** American National Standards Institute.

**API.** Application programming interface.

**APPL.** A VTAM network definition statement used to define DB2 to VTAM as an application program using SNA LU 6.2 protocols.

**application.** A program or set of programs that perform a task; for example, a payroll application.

**application plan.** The control structure produced during the bind process and used by DB2 to process SQL statements encountered during statement execution.

**application process.** The unit to which resources and locks are allocated. An application process involves the execution of one or more programs.

**application program interface (API).** A functional interface supplied by the operating system or by a separately orderable licensed program that allows an application program written in a high-level language to use specific data or functions of the operating system or licensed program.

**application server.** See *server*.

**archive log.** The portion of the DB2 log that contains log records that have been copied from the active log.

**AS.** Application server. See *server*.

**ASCII.** An encoding scheme used to represent strings in many environments, typically on PCs and workstations. Contrast with *EBCDIC*.

## attachment facility • character string

**attachment facility.** An interface between DB2 and TSO, IMS, CICS, or batch address spaces. An attachment facility allows application programs to access DB2.

**attribute.** A characteristic of an entity. For example, in database design, the phone number of an employee is one of that employee's attributes.

**authorization ID.** A string that can be verified for connection to DB2 and to which a set of privileges are allowed. It can represent an individual, an organizational group, or a function, but DB2 does not determine this representation.

## B

**backward log recovery.** The fourth and final phase of restart processing during which DB2 scans the log in a backward direction to apply UNDO log records for all aborted changes.

**base table.** A table created by the SQL CREATE TABLE statement that is used to hold persistent data. Contrast with *result table* and *temporary table*.

**basic sequential access method (BSAM).** An access method for storing or retrieving data blocks in a continuous sequence, using either a sequential access or a direct access device.

**binary integer.** A basic data type that can be further classified as small integer or large integer.

**bind.** The process by which the output from the DB2 precompiler is converted to a usable control structure called a package or an application plan. During the process, access paths to the data are selected and some authorization checking is performed.

**automatic bind.** (More correctly *automatic rebind*). A process by which SQL statements are bound automatically (without a user issuing a BIND command) when an application process begins execution and the bound application plan or package it requires is not valid.

**dynamic bind.** A process by which SQL statements are bound as they are entered.

**incremental bind.** A process by which SQL statements are bound during the execution of an application process, because they could not be bound during the bind process, and VALIDATE(RUN) was specified.

**static bind.** A process by which SQL statements are bound after they have been precompiled. All static SQL statements are prepared for execution at the same time. Contrast with *dynamic bind*.

**BMP.** Batch Message Processing (IMS).

**bootstrap data set (BSDS).** A VSAM data set that contains name and status information for DB2, as well as RBA range specifications, for all active and archive log data sets. It also contains passwords for the DB2 directory and catalog, and lists of conditional restart and checkpoint records.

**BSAM.** Basic sequential access method.

**BSDS.** Bootstrap data set.

**buffer pool.** Main storage reserved to satisfy the buffering requirements for one or more table spaces or indexes.

**built-in function.** Scalar function or column function.

## C

**cache structure.** A coupling facility structure that stores data that can be available to all members of a Sysplex. A DB2 data sharing group uses cache structures as group buffer pools.

**CAF.** Call attachment facility.

**call attachment facility (CAF).** A DB2 attachment facility for application programs running in TSO or MVS batch. The CAF is an alternative to the DSN command processor and allows greater control over the execution environment.

**cascade delete.** The enforcement of referential constraints by DB2 when it deletes all descendent rows of a deleted parent row.

**castout.** The DB2 process of writing changed pages from a group buffer pool to DASD.

**catalog.** In DB2, a collection of tables that contains descriptions of objects such as tables, views, and indexes.

**catalog table.** Any table in the DB2 catalog.

**CCSID.** Coded character set identifier.

**CDB.** See *communications database*.

**CFRM policy.** A declaration by an MVS administrator regarding the allocation rules for a coupling facility structure.

**character set.** A defined set of characters.

**character string.** A sequence of bytes representing bit data, single-byte characters, or a mixture of single and double-byte characters.

**check clause.** An extension to the SQL CREATE TABLE and SQL ALTER TABLE statements that specifies a table check constraint.

**check constraint.** See *table check constraint*.

**check integrity.** The condition that exists when each row in a table conforms to the table check constraints defined on that table. Maintaining check integrity requires enforcing table check constraints on operations that add or change data.

**check pending.** A state of a table space or partition that prevents its use by some utilities and some SQL statements, because it can contain rows that violate referential constraints, table check constraints, or both.

**checkpoint.** A point at which DB2 records internal status information on the DB2 log that would be used in the recovery process if DB2 should abend.

**CI.** Control interval.

**CICS.** Represents (in this publication) CICS/MVS and CICS/ESA.

**CICS/MVS:** Customer Information Control System/Multiple Virtual Storage.

**CICS/ESA:** Customer Information Control System/Enterprise Systems Architecture.

**CICS attachment facility.** A DB2 subcomponent that uses the MVS Subsystem Interface (SSI) and cross storage linkage to process requests from CICS to DB2 and to coordinate resource commitment.

**CIDF.** Control interval definition field.

**claim.** To register to DB2 that an object is being accessed. This registration is also called a claim. A claim is used to ensure that an object cannot be drained until a commit is reached. Contrast with *drain*.

**claim class.** A specific type of object access which can be one of the following:

- cursor stability (CS)
- repeatable read (RR)
- write

**claim count.** A count of the number of agents that are accessing an object.

**clause.** In SQL, a distinct part of a statement, such as a SELECT clause or a WHERE clause.

**CLIST.** Command list. A language for performing TSO tasks.

**clustering index.** An index that determines how rows are physically ordered in a table space.

**coded character set.** A set of unambiguous rules that establish a character set and the one-to-one relationships between the characters of the set and their coded representations.

**coded character set identifier (CCSID).** A 16-bit number that uniquely identifies a coded representation of graphic characters. It designates an encoding scheme identifier and one or more pairs consisting of a character set identifier and an associated code page identifier.

**cold start.** A process by which DB2 restarts without processing any log records. Contrast with *warm start*.

**collection.** A group of packages that have the same qualifier.

**column.** The vertical component of a table. A column has a name and a particular data type (for example, character, decimal, or integer).

**command.** A DB2 operator command or a DSN subcommand. Distinct from an SQL statement.

**command prefix.** A one- to eight-character command identifier. The command prefix distinguishes the command as belonging to an application or subsystem rather than MVS.

**command recognition character (CRC).** A character that permits an MVS console operator or an IMS subsystem user to route DB2 commands to specific DB2 subsystems.

**command scope.** The scope of command operation in a data sharing group. If a command has *member scope*, the command displays information from the one member only or affects only non-shared resources owned locally by that member. If a command has *group scope*, the command displays information from all members, affects non-shared resources owned locally by all members, displays information on sharable resources, or affects sharable resources.

**commit.** The operation that ends a unit of work by releasing locks so that the database changes made by that unit of work can be perceived by other processes.

**commit point.** A point in time when data is considered consistent.

**committed phase.** The second phase of the multi-site update process that requests all participants to commit the effects of the logical unit of work.

**communications database (CDB).** A set of tables in the DB2 catalog that are used to establish conversations with remote database management systems.

**compression dictionary.** The dictionary that controls the process of compression and decompression. This dictionary is created from the data in the table space or table space partition.

**concurrency.** The shared use of resources by more than one application process at the same time.

**conditional restart.** A DB2 restart that is directed by a user-defined conditional restart control record (CRCR).

**connection.** The existence of a communication path between two partner LUs that allows information to be exchanged (for example, two DB2s connected and communicating by way of a conversation).

**connection ID.** An identifier supplied by the attachment facility that is associated with a specific address space connection.

**consistency token.** A timestamp used to generate the version identifier for an application. See also *version*.

**constant.** A language element that specifies an unchanging value. Constants are classified as string constants or numeric constants. Contrast with *variable*.

**constraint.** A rule that limits the values that can be inserted, deleted, or updated in a table. See *referential constraint*, *uniqueness constraint*, and *table check constraint*.

**control interval (CI).** A fixed-length area or direct access storage in which VSAM stores records and creates distributed free space. Also, in a key-sequenced data set or file, the set of records pointed to by an entry in the sequence-set index record. The control interval is the unit of information that VSAM transmits to or from direct access storage. A control interval always includes an integral number of physical records.

**control interval definition field (CIDF).** In VSAM, a field located in the four bytes at the end of each control interval; it describes the free space, if any, in the control interval.

**conversation.** (1) A VTAM term for a dialog between two application processes, on different DB2 subsystems, that is specified by a particular *session name*, *mode name*, and *LU name*. (2) An LU 6.2 security option which allows DB2 to require the user's authorization ID and password when allocating a conversation to a partner DB2. The user is validated by the partner DB2.

**coordinator.** The system component that coordinates the commit or rollback of a unit of work that includes work done on one or more other systems.

**correlation ID.** An identifier associated with a specific thread. In TSO, it is either an authorization ID or the job name.

**coupling facility.** A special PR/SM LPAR logical partition that runs the coupling facility control program and provides high-speed caching, list processing, and locking functions in a Sysplex.

**CRC.** Command recognition character.

**CRCR.** Conditional restart control record.

**cross-system coupling facility (XCF).** A component of MVS that provides functions to support cooperation between authorized programs running within a Sysplex.

**current data.** Data within a host structure that is current with (identical to) the data within the base table.

**current status rebuild.** The second phase of restart processing during which the status of the subsystem is reconstructed from information on the log.

**cursor.** A named control structure used by an application program to point to a row of interest within some set of rows, and to retrieve rows from the set, possibly making updates or deletions.

**cursor stability (CS).** The isolation level that provides maximum concurrency without the ability to read uncommitted data. With cursor stability, a unit of work holds locks only on its uncommitted changes and on the current row of each of its cursors.

**cycle.** A set of tables that can be ordered so that each table is a descendent of the one before it, and the first is a descendent of the last. A self-referencing table is a cycle with a single member.

## D

**DASD.** Direct access storage device.

**database.** A collection of tables, or a collection of table spaces and index spaces.

**database access thread.** A thread accessing data at the local subsystem on behalf of a remote subsystem.

**database administrator (DBA).** An individual responsible for the design, development, operation, safeguarding, maintenance, and use of a database.

**database descriptor (DBD).** An internal representation of DB2 database definition which reflects the data definition found in the DB2 catalog. The objects defined in a database descriptor are table spaces, tables, indexes, index spaces, and relationships.

**database management system (DBMS).** A software system that controls the creation, organization, and modification of a database and access to the data stored within it.

**database request module (DBRM).** A data set member created by the DB2 precompiler that contains information about SQL statements. DBRMs are used in the bind process.

**DATABASE 2 Interactive (DB2I).** The DB2 facility that provides for the execution of SQL statements, DB2 (operator) commands, programmer commands, and utility invocation.

**data currency.** The state in which data retrieved into a host variable in your program is a copy of data in the base table.

**data definition name (DD name).** The name of a data definition (DD) statement that corresponds to a data control block containing the same name.

**Data Language/I (DL/I).** The IMS data manipulation language; a common high-level interface between a user application and IMS.

**data partition.** A VSAM data set that is contained within a partitioned table space.

**data sharing.** The ability of two or more DB2 subsystems to directly access and change a single set of data.

**data sharing group.** A collection of one or more DB2 subsystems that directly access and change the same data while maintaining data integrity.

**data sharing member.** A DB2 subsystem assigned by XCF services to a data sharing group.

**data type.** An attribute of columns, literals, host variables, special registers, and the results of functions and expressions.

**date.** A three-part value that designates a day, month, and year.

**date duration.** A decimal integer that represents a number of years, months, and days.

**DBA.** Database administrator.

**DBCS.** Double-byte character set.

**DBD.** Database descriptor.

**DBID.** Database identifier.

**DBMS.** Database management system.

**DBRM.** Database request module.

**DB2 catalog.** Tables maintained by DB2 that contain descriptions of DB2 objects such as tables, views, and indexes.

**DB2 command.** An instruction to the DB2 subsystem allowing a user to start or stop DB2, to display information on current users, to start or stop databases, to display information on the status of databases, and so on.

**DB2I.** DATABASE 2 Interactive.

**DB2 private protocol access.** A method of accessing distributed data by which you can direct a query to another DB2 system by using an alias or a three-part name to identify the DB2 subsystems at which the statements are executed. Contrast with *DRDA access*.

**DB2 private protocol connection.** A DB2 private connection of the application process. See also *private connection*.

**DCLGEN.** Declarations generator.

**DDF.** Distributed data facility.

**DD name.** Data definition name.

**deadlock.** Unresolvable contention for the use of a resource such as a table or an index.

**declarations generator (DCLGEN).** A subcomponent of DB2 that generates SQL table declarations and COBOL, C, or PL/I data structure declarations that conform to the table. The declarations are generated from DB2 system catalog information. DCLGEN is also a DSN subcommand.

**default value.** A predetermined value, attribute, or option that is assumed when no other is explicitly specified.

**delimited identifier.** A sequence of characters enclosed within quotation marks ("). The sequence must consist of a letter followed by zero or more characters, each of which is a letter, digit, or the underscore character (\_).

**dependent.** An object (row, table, or table space) is a dependent if it has at least one parent. The object is also said to be a dependent (row, table, or table space) of its parent. See *parent row*, *parent table*, *parent table space*.

**dependent row.** A row that contains a foreign key that matches the value of a primary key in the parent row.

**dependent table.** A table that is dependent in at least one referential constraint.

## descendent • explicit hierarchical locking

**descendent.** An object is a descendent of another object if it is a dependent of the object, or if it is the dependent of a descendent of that object.

**descendent row.** A row that is dependent on another row or a row that is a dependent of a descendent row.

**descendent table.** A table that is a dependent of another table or a dependent of a descendent table.

**direct access storage device (DASD).** A device in which access time is independent of the location of the data.

**directory.** The system database that contains internal objects such as database descriptors and skeleton cursor tables.

**distributed data facility (DDF).** A set of DB2 components through which DB2 communicates with another RDBMS.

**distributed relational database architecture (DRDA).** A connection protocol for distributed relational database processing that is used by IBM's relational database products. DRDA includes protocols for communication between an application and a remote relational database management system, and for communication between relational database management systems.

**DL/I.** Data Language/I. The IMS data manipulation language; a common high-level interface between a user application and IMS.

**double-byte character set (DBCS).** A set of characters used by national languages such as Japanese and Chinese that have more symbols than can be represented by a single byte. Each character is two bytes in length, and therefore requires special hardware to be displayed or printed.

**double-precision floating point number.** A 64-bit approximate representation of a real number.

**drain.** To acquire a locked resource by quiescing access to that object.

**drain lock.** A lock on a claim class which prevents a claim from occurring.

**DRDA.** Distributed relational database architecture.

**DRDA access.** A method of accessing distributed data by which you can explicitly connect to another location, using an SQL statement, to execute packages that have been previously bound at that location. The SQL CONNECT statement is used to identify application servers, and SQL statements are executed using packages that were previously bound at those servers. Contrast with *DB2 private protocol access*.

**DSN.** (1) The default DB2 subsystem name. (2) The name of the TSO command processor of DB2. (3) The first three characters of DB2 module and macro names.

**duration.** A number that represents an interval of time. See *date duration*, *labeled duration*, and *time duration*.

**dynamic SQL.** SQL statements that are prepared and executed within an application program while the program is executing. In dynamic SQL, the SQL source is contained in host language variables rather than being coded into the application program. The SQL statement can change several times during the application program's execution.

## E

**EBCDIC.** Extended binary coded decimal interchange code. An encoding scheme used to represent character data in the MVS, VM, VSE, and OS/400 environments. Contrast with *ASCII*.

**EDM pool.** A pool of main storage used for database descriptors and application plans.

**embedded SQL.** SQL statements coded within an application program. See *static SQL*.

**escape character.** The symbol used to enclose an SQL delimited identifier. The escape character is the quotation mark ("), except in COBOL applications, where the symbol (either a quotation mark or an apostrophe) can be assigned by the user.

**ESDS.** Entry sequenced data set.

**EUR.** IBM European Standards.

**exception table.** A table that holds rows that violate referential constraints or table check constraints found by the CHECK DATA utility.

**exclusive lock.** A lock that prevents concurrently executing application processes from reading or changing data. Contrast with *shared lock*.

**executable statement.** An SQL statement that can be embedded in an application program, dynamically prepared and executed, or issued interactively.

**exit routine.** A user-written (or IBM-provided default) program that receives control from DB2 to perform specific functions. Exit routines run as extensions of DB2.

**explicit hierarchical locking.** Locking used to make the parent/child relationship between resources known to IRLM. This is done to avoid global locking overhead when no inter-DB2 interest exists on a resource.

## F

**failed member state.** A state of a member of a data sharing group. A failed member has permanent status recording with XCF, and its task, address space, or MVS system has terminated before the state changed from active to quiesced.

**fallback.** The process of returning to a previous release of DB2 after attempting or completing migration to a current release.

**false global lock contention.** A contention indication from the coupling facility when multiple lock names are hashed to the same indicator and when there is no real contention.

**field procedure.** A user-written exit routine designed to receive a single value and transform (encode or decode) it in any way the user can specify.

**fixed-length string.** A character or graphic string whose length is specified and cannot be changed. Contrast with *varying-length string*.

**foreign key.** A key that is specified in the definition of a referential constraint. Because of the foreign key, the table is a dependent table. The key must have the same number of columns, with the same descriptions, as the primary key of the parent table.

**forward log recovery.** The third phase of restart processing during which DB2 processes the log in a forward direction to apply all REDO log records.

**free space.** The total unused space in a page, that is, the space not used to store records or control information.

**function.** A scalar function or column function. Same as *built-in function*.

## G

**GB.** Gigabyte (1,073,741,824 bytes).

**GBP-dependent.** A page set or page set partition status when it is dependent upon the group bufferpool. There is either inter-DB2 read/write interest active for this page set or the page set has changed pages in the group buffer pool that have not yet been castout to DASD.

**generalized trace facility (GTF).** An MVS service program that records significant system events such as I/O interrupts, SVC interrupts, program interrupts, or external interrupts.

**getpage.** An operation in which DB2 accesses a data page.

**global lock.** A lock that provides both intra-DB2 concurrency control and inter-DB2 concurrency control, that is, the scope of the lock is across all the DB2s of a data sharing group.

**global lock contention.** Conflicts on locking requests between different DB2 members of a data sharing group regarding attempts to serialize shared resources.

**governor.** See *resource limit facility*.

**gross lock.** The *shared*, *update*, or *exclusive* mode locks on a table, partition, or table space.

**group buffer pool.** A coupling facility cache structure used by a data sharing group to cache data and to ensure that the data is consistent for all members.

**group buffer pool duplexing.** The ability to write data to two instances of a group buffer pool structure; a *primary group buffer pool* and a *secondary group buffer pool*. OS/390 publications refer to these instances as the 'old' (for primary) and 'new' (for secondary) structures.

**group name.** The MVS XCF identifier for a data sharing group.

**group restart.** A restart of at least one member of a data sharing group after either locks or the shared communications area have been lost.

**GTF.** Generalized trace facility.

## H

**help panel.** A screen of information presenting tutorial text to assist a user at the terminal.

**host language.** A programming language in which you can embed SQL statements.

**host program.** An application program written in a host language that contains embedded SQL statements.

**HSM.** Hierarchical storage manager.

## I

**IDCAMS.** An IBM program used to process access method services (AMS) commands. It can be invoked as a job or jobstep, from a TSO terminal, or from within a user's application program.

**identify.** A request that an attachment service program in an address space separate from DB2 issues via the

MVS subsystem interface to inform DB2 of its existence and initiate the process of becoming connected to DB2.

**IFCID.** Instrumentation facility component identifier.

**IFI.** Instrumentation facility interface.

**IFI call.** An invocation of the instrumentation facility interface (IFI) by means of one of its defined functions.

**image copy.** An exact reproduction of all or part of a table space. DB2 provides utility programs to make full image copies (to copy the entire table space) or incremental image copies (to copy only those pages that have been modified since the last image copy).

**IMS.** Information Management System.

**IMS attachment facility.** A DB2 subcomponent that uses MVS Subsystem Interface (SSI) protocols and cross-memory linkage to process requests from IMS to DB2 and to coordinate resource commitment.

**in-abort.** A status of a unit of recovery. If DB2 fails after a unit of recovery begins to be rolled back, but before the process is completed, DB2 will continue to back out the changes during restart.

**in-commit.** A status of a unit of recovery. If DB2 fails after beginning its phase 2 commit processing, it "knows," when restarted, that changes made to data are consistent. Such units of recovery are termed *in-commit*.

**index.** A set of pointers that are logically ordered by the values of a key. Indexes can provide faster access to data and can enforce uniqueness on the rows in a table.

**index key.** The set of columns in a table used to determine the order of index entries.

**index partition.** A VSAM data set that is contained within a partitioned index space.

**index space.** A page set used to store the entries of one index.

**indoubt.** A status of a unit of recovery. If DB2 fails after it has finished its phase 1 commit processing and before it has started phase 2, only the commit coordinator knows if this unit of recovery is to be committed or rolled back. At emergency restart, if DB2 does not have the information needed to make this decision, its unit of recovery is *indoubt* until DB2 obtains this information from the coordinator.

**indoubt resolution.** The process of resolving the status of an indoubt logical unit of work to either the committed or the rollback state.

**inflight.** A status of a unit of recovery. If DB2 fails before its unit of recovery completes phase 1 of the commit process, it merely backs out the updates of its unit of recovery when it is restarted. These units of recovery are termed *inflight*.

**instrumentation facility component identifier (IFCID).** Names a traceable event and identifies the trace record of that event. As a parameter on the -START TRACE and -MODIFY TRACE commands, it specifies tracing the corresponding event.

**Interactive System Productivity Facility (ISPF).** An IBM licensed program that provides interactive dialog services.

**internal resource lock manager (IRLM).** An MVS subsystem used by DB2 to control communication and database locking.

**inter-DB2 R/W interest.** A property of data in a table space, index, or partition that has been opened by more than one member of a data sharing group and that has been opened for writing by at least one of those members.

**IRLM.** internal resource lock manager.

**ISO.** International Standards Organization.

**isolation level.** The degree to which a unit of work is isolated from the updating operations of other units of work. See also *cursor stability*, *repeatable read*, *uncommitted read*, and *read stability*.

**ISPF.** Interactive System Productivity Facility.

**ISPF/PDF.** Interactive System Productivity Facility/Program Development Facility.

## J

**JCL.** Job control language.

**JES.** MVS Job Entry Subsystem.

**JIS.** Japanese Industrial Standard.

## K

**KB.** Kilobyte (1024 bytes).

**key.** A column or an ordered collection of columns identified in the description of a table, index, or referential constraint.

**KSDS.** Key sequenced data set.



## L

**labeled duration.** A number that represents a duration of years, months, days, hours, minutes, seconds, or microseconds.

**leaf page.** A page that contains pairs of keys and RIDs and that points to actual data. Contrast with *nonleaf page*.

**link-edit.** To create a loadable computer program using a linkage editor.

**L-lock.** See *logical lock*.

**load module.** A program unit that is suitable for loading into main storage for execution. The output of a linkage editor.

**local.** Refers to any object maintained by the local DB2 subsystem. A *local table*, for example, is a table maintained by the local DB2 subsystem. Contrast with *remote*.

**local lock.** A lock that provides intra-DB2 concurrency control, but does not provide inter-DB2 concurrency control; that is, its scope is a single DB2.

**local subsystem.** The unique RDBMS to which the user or application program is directly connected (in the case of DB2, by one of the DB2 attachment facilities).

**location name.** The name by which DB2 refers to a particular DB2 subsystem in a network of subsystems. Contrast with *LU name*.

**lock.** A means of controlling concurrent events or access to data. DB2 locking is performed by the IRLM.

**lock duration.** The interval over which a DB2 lock is held.

**lock escalation.** The promotion of a lock from a row or page lock to a table space lock because the number of page locks concurrently held on a given resource exceeds a preset limit.

**locking.** The process by which the integrity of data is ensured. Locking prevents concurrent users from accessing inconsistent data.

**lock mode.** A representation for the type of access concurrently running programs can have to a resource held by a DB2 lock.

**lock object.** The resource that is controlled by a DB2 lock.

**lock parent.** For explicit hierarchical locking, a lock held on a resource that has child locks that are lower in

the hierarchy; usually the table space or partition intent locks are the parent locks.

**lock promotion.** The process of changing the size or mode of a DB2 lock to a higher level.

**lock size.** The amount of data controlled by a DB2 lock on table data; the value can be a row, a page, a table, or a table space.

**lock structure.** A coupling facility data structure composed of a series of lock entries to support shared and exclusive locking for logical resources.

**log.** A collection of records that describe the events that occur during DB2 execution and their sequence. The information thus recorded is used for recovery in the event of a failure during DB2 execution.

**logical claim.** A claim on a logical partition of a non-partitioned index.

**logical drain.** A drain on a logical partition of a non-partitioned index.

**logical index partition.** The set of all keys that reference the same data partition.

**logical lock.** The lock type used by transactions to control intra- and inter-DB2 data concurrency between transactions.

**logical page list (LPL).** A list of pages in error that cannot be referenced by applications until the pages are recovered. The page is in 'logical error' because there may be nothing wrong with the media (coupling facility or DASD) itself. Usually a connection to the media has been lost.

**logical partition.** A set of key/RID pairs in a nonpartitioned index that are associated with a particular partition.

**logical unit.** An access point through which an application program accesses the SNA network in order to communicate with another application program.

**logical unit of work (LUW).** In IMS, the processing that program performs between synchronization points.

**logical unit of work identifier (LUWID).** A name that uniquely identifies a thread within a network. This name consists of a fully-qualified LU network name, an LUW instance number, and an LUW sequence number.

**log initialization.** The first phase of restart processing during which DB2 attempts to locate the current end of the log.

**log record sequence number (LRSN).** A number DB2 generates and associates with each log record.

## log truncation • OBID

DB2 also uses the LRSN for page versioning. The LRSNs generated by a given DB2 data sharing group form a strictly increasing sequence for each DB2 log and a strictly increasing sequence for each page across the DB2 group.

**log truncation.** A process by which an explicit starting RBA is established. This RBA is the point at which the next byte of log data will be written.

**LPL.** See *logical page list*.

**LRH.** Log record header.

**LRSN.** See *log record sequence number*.

**LU name.** From *logical unit name*, the name by which VTAM refers to a node in a network. Contrast with *location name*.

**LUW.** Logical unit of work.

**LUWID.** Logical unit of work identifier.

## M

**MB.** Megabyte (1,048,576 bytes).

**member name.** The MVS XCF identifier for a particular DB2 subsystem in a data sharing group.

**menu.** A displayed list of available functions for selection by the operator. Sometimes called a *menu panel*.

**migration.** The process of converting a DB2 subsystem with a previous release of DB2 to an updated or current release. In this process, you can acquire the functions of the updated or current release without losing the data you created on the previous release.

**mixed data string.** A character string that can contain both single-byte and double-byte characters.

**modify locks.** An L-lock or P-lock that has been specifically requested as having the MODIFY attribute. A list of these active locks are kept at all times in the coupling facilitylock structure. If the requesting DB2 fails, that DB2's modify locks are converted to *retained locks*.

**MPP.** Message processing program (IMS).

**MTO.** Master terminal operator.

**multi-site update.** Distributed relational database processing in which data is updated in more than one location within a single unit of work.

**MVS.** Multiple Virtual Storage.

**MVS/ESA.** Multiple Virtual Storage/Enterprise Systems Architecture.

**MVS/XA.** Multiple Virtual Storage/Extended Architecture.

## N

**negotiable lock.** A lock whose mode can be downgraded, by agreement among contending users, to be compatible to all. A physical lock is an example of a negotiable lock.

**NID (network identifier).** The network ID assigned by IMS or CICS, or if the connection type is RRSAF, the OS/390 RRS Unit of Recovery ID (URID).

**nonleaf page.** A page that contains keys and page numbers of other pages in the index (either leaf or nonleaf pages). Nonleaf pages never point to actual data.

**nonpartitioned index.** Any index that is not the partitioned index of a partitioned table space.

**NUL.** In C, a single character that denotes the end of the string.

**null.** A special value that indicates the absence of information.

**NUL-terminated host variable.** A varying-length host variable in which the end of the data is indicated by the presence of a NUL terminator.

**NUL terminator.** In C, the value that indicates the end of a string. For character strings, the NUL terminator is X'00'.

## O

**OASN (origin application schedule number).** In IMS, a 4-byte number assigned sequentially to each IMS schedule since the last cold start of IMS and used as an identifier for a unit of work. In an 8-byte format, the first four bytes contain the schedule number and the last four contain the number of IMS sync points (*commit points*) during the current schedule. The OASN is part of the NID for an IMS connection.

**OBID.** Data object identifier.

## P

**package.** Also *application package*. An object containing a set of SQL statements that have been bound statically and that are available for processing.

**package list.** An ordered list of package names that may be used to extend an application plan.

**page.** A unit of storage within a table space (4KB or 32KB) or index space (4KB). In a table space, a page contains one or more rows of a table.

**page set.** A table space or index space consisting of pages that are either 4KB or 32KB in size. Each page set is made from a collection of VSAM data sets.

**page set recovery pending (PSRCP).** A restrictive state of an index space in which the page set is in a recovery pending state. In this case, the entire page set must be recovered. Recovery of a logical part is prohibited.

**panel.** A predefined display image that defines the locations and characteristics of display fields on a display surface (for example, a *menu panel*).

**parallel I/O processing.** A form of I/O processing in which DB2 initiates multiple concurrent requests for a single user query and performs I/O processing concurrently (in *parallel*), on multiple data partitions.

**parent row.** A row whose primary key value is the foreign key value of a dependent row.

**parent table.** A table whose primary key is referenced by the foreign key of a dependent table.

**parent table space.** A table space that contains a parent table. A table space containing a dependent of that table is a dependent table space.

**participant.** An entity other than the commit coordinator that takes part in the commit process. Synonymous with *agent* in SNA.

**partition.** A portion of a page set. Each partition corresponds to a single, independently extendable data set. Partitions can be extended to a maximum size of 1, 2, or 4 gigabytes, depending upon the number of partitions in the partitioned page set. All partitions of a given page set have the same maximum size.

**partitioned page set.** A partitioned table space or an index space. Header pages, space map pages, data pages, and index pages reference data only within the scope of the partition.

**partitioned table space.** A table space subdivided into parts (based upon index key range), each of which may be processed by utilities independently.

**partner logical unit.** An access point in the SNA network that is connected to the local DB2 by way of a VTAM conversation.

**piece.** A data set of a nonpartitioned page set.

**physical claim.** A claim on an entire nonpartitioned index.

**physical drain.** A drain on an entire nonpartitioned index.

**physical lock contention.** Conflicting states of the requesters for a physical lock. See *negotiable lock*.

**physical lock (P-lock).** A lock type used only by data sharing that is acquired by DB2 to provide consistency of data cached in different DB2 subsystems.

**plan.** See *application plan*.

**plan allocation.** The process of allocating DB2 resources to a plan in preparation to execute it.

**plan name.** The name of an application plan.

**P-lock.** See *physical lock*.

**point of consistency.** A time when all recoverable data an application accesses is consistent with other data. Synonymous with *sync point* or *commit point*.

**policy.** See *CFRM policy*.

**precompilation.** A processing of application programs containing SQL statements that takes place before compilation. SQL statements are replaced with statements that are recognized by the host language compiler. Output from this precompilation includes source code that can be submitted to the compiler and the database request module (DBRM) that is input to the bind process.

**prefix.** A code at the beginning of a message or record.

**prepare.** The first phase of a two-phase commit process in which all participants are requested to prepare for commit.

**primary authorization ID.** The authorization ID used to identify the application process to DB2.

**primary group buffer pool.** For a duplexed group buffer pool, the structure used to maintain the coherency of cached data; that is, the structure used for page registration and cross-invalidation. The OS/390

## primary index • referential integrity

equivalent is 'old' structure. Compare with *secondary group buffer pool*.

**primary index.** An index that enforces the uniqueness of a primary key.

**private connection.** A communications connection that is specific to DB2.

**privilege.** The capability of performing a specific function, sometimes on a specific object. The term includes:

**explicit privileges,** which have names and are held as the result of SQL GRANT and REVOKE statements. For example, the SELECT privilege.

**implicit privileges,** which accompany the ownership of an object, such as the privilege to drop a synonym one owns, or the holding of an authority, such as the privilege of SYSADM authority to terminate any utility job.

**privilege set.** For the installation SYSADM ID, the set of all possible privileges. For any other authorization ID, the set of all privileges recorded for that ID in the DB2 catalog.

**process.** A general term for a unit that depends on the environment, but has the same basic properties in every environment. A process involves the execution of one or more programs, and is the unit to which resources and locks are allocated. The execution of an SQL statement is always associated with some process.

**program.** A single compilable collection of executable statements in a programming language.

**protected conversation.** A VTAM conversation that supports two-phase commit flows.

**PSRCP.** Page set recovery pending.

## Q

**QMF.** Query Management Facility.

**query.** A component of certain SQL statements that specifies a result table.

**quiesced member state.** A state of a member of a data sharing group. An active member becomes quiesced when a STOP DB2 command takes effect without a failure. If the member's task, address space, or MVS system fails before the command takes effect, the member state is failed.

## R

**RACF.** OS/VS2 MVS Resource Access Control Facility.

**RBA.** Relative byte address.

**RCT.** Resource control table (CICS attachment facility).

**read stability (RS).** An isolation level that is similar to repeatable read but does not completely isolate an application process from all other concurrently executing application processes. Under level RS, an application that issues the same query more than once might read additional rows, known as *phantom rows*, that were inserted and committed by a concurrently executing application process.

**rebind.** To create a new application plan for an application program that has been bound previously. If, for example, you have added an index for a table accessed by your application, you must rebind the application in order to take advantage of that index.

**record.** The storage representation of a row or other data.

**record identifier (RID) pool.** An area of main storage above the 16MB line that is reserved for sorting record identifiers during list prefetch processing.

**recovery.** The process of rebuilding databases after a system failure.

**recovery log.** A collection of records that describes the events that occur during DB2 execution and their sequence. The information recorded is used for recovery in the event of a failure during DB2 execution.

**recovery pending (RECP).** This condition prevents SQL access to a table space or index space that may need to be recovered.

**RECP.** Recovery pending.

**redo.** A state of a unit of recovery which indicates that changes made are to be reapplied to the DASD media to ensure data integrity.

**referential constraint.** The requirement that nonnull values of a designated foreign key are valid only if they equal values of the primary key of a designated table.

**referential integrity.** The condition that exists when all intended references from data in one column of a table to data in another column of the same or a different table are valid. Maintaining referential integrity requires enforcing referential constraints on all LOAD,

RECOVER, INSERT, UPDATE, and DELETE operations.

**relationship.** A defined connection between the rows of a table or the rows of two tables. A relationship is the internal representation of a referential constraint.

**relative byte address (RBA).** The offset of a data record or control interval from the beginning of the storage space allocated to the data set or file to which it belongs.

**remote.** Refers to any object maintained by a remote DB2 subsystem; that is, by a DB2 subsystem other than the local one. A *remote view*, for instance, is a view maintained by a remote DB2 subsystem. Contrast with *local*.

**remote subsystem.** Any RDBMS, except the *local subsystem*, with which the user or application can communicate. The subsystem need not be remote in any physical sense, and may even operate on the same processor under the same MVS system.

**repeatable read (RR).** The isolation level that provides maximum protection from other executing application programs. When an application program executes with repeatable read protection, rows referenced by the program cannot be changed by other programs until the program reaches a commit point.

**request commit.** The vote submitted to the prepare phase if the participant has modified data and is prepared to commit or roll back.

**resource.** The object of a lock or claim, which could be a table space, an index space, a data partition, an index partition, or a logical partition.

**resource control table (RCT).** A construct of the CICS attachment facility, created by site-provided macro parameters, that defines authorization and access attributes for transactions or transaction groups.

**resource limit facility (RLF).** A portion of DB2 code that prevents dynamic manipulative SQL statements from exceeding specified time limits.

**resource limit specification table.** A site-defined table that specifies the limits to be enforced by the resource limit facility.

**result table.** The set of rows specified by a SELECT statement.

**retained lock.** A MODIFY lock that was held by a DB2 when that DB2 failed. The lock is retained in the coupling facility lock structure across a DB2 failure.

**RID pool.** Record identifier pool.

**RLF.** Resource limit facility.

**RMID.** Resource manager identifier.

**RO.** Read-only access.

**rollback.** The process of restoring data changed by SQL statements to the state at its last commit point. All locks are freed. Contrast with *commit*.

## S

**SBCS.** Single-byte character set.

**SCA.** See *shared communications area*.

**scalar function.** An SQL operation that produces a single value from another value and is expressed as a function name followed by a list of arguments enclosed in parentheses. See also *column function*.

**search condition.** A criterion for selecting rows from a table. A search condition consists of one or more predicates.

**secondary authorization ID.** An authorization ID that has been associated with a primary authorization ID by an authorization exit routine.

**secondary group buffer pool.** For a duplexed group buffer pool, the structure used to back up changed pages that are written to the primary group buffer pool. No page registration or cross-invalidation occurs using the secondary group buffer pool. The OS/390 equivalent is 'new' structure.

**section.** The segment of a plan or package that contains the executable structures for a single SQL statement. For most SQL statements, there is one section in the plan for each SQL statement in the source program. However, for cursor-related statements, the DECLARE, OPEN, FETCH, and CLOSE reference the same section because they each refer to the SELECT statement named in the DECLARE CURSOR statement. SQL statements such as COMMIT, ROLLBACK, and some SET statements do not use a section.

**segmented table space.** A table space that is divided into equal-sized groups of pages called segments. Segments are assigned to tables so that rows of different tables are never stored in the same segment.

**sequential data set.** A non-DB2 data set whose records are organized on the basis of their successive physical positions, such as on magnetic tape. Several of the DB2 database utilities require sequential data sets.

**sequential prefetch.** A mechanism that triggers consecutive asynchronous I/O operations. Pages are

## server • sync point

fetched before they are required, and several pages are read with a single I/O operation.

**server.** Also *application server (AS)*. The target for a request from a remote RDBMS, the RDBMS that provides the data.

**session.** A link between two nodes in a VTAM network.

**shared communications area (SCA).** A coupling facility list structure used by a DB2 data sharing group for inter-DB2 communication.

**shared lock.** A lock that prevents concurrently executing application processes from changing data, but not from reading data.

**shift-in character.** A special control character (X'0F') used in EBCDIC systems to denote that the following bytes represent SBCS characters. See *shift-out character*.

**shift-out character.** A special control character (X'0E') used in EBCDIC systems to denote that the following bytes, up to the next shift-in control character, represent DBCS characters.

**sign-on.** A request made on behalf of an individual CICS or IMS application process by an attach facility to enable DB2 to verify that it is authorized to use DB2 resources.

**simple table space.** A table space that is neither partitioned nor segmented.

**single-byte character set (SBCS).** A set of characters in which each character is represented by a single byte.

**SMF.** System management facility.

**SMS.** Storage Management Subsystem.

**SNA.** Systems Network Architecture.

**source program.** A set of host language statements and SQL statements that is processed by an SQL pre-compiler.

**SPUFI.** SQL Processor Using File Input. A facility of the TSO attachment subcomponent that enables the DB2I user to execute SQL statements without embedding them in an application program.

**SQL.** Structured Query Language.

**SQL authorization ID (SQL ID).** The authorization ID that is used for checking dynamic SQL statements in some situations.

**SQL Communication Area (SQLCA).** A structure used to provide an application program with information about the execution of its SQL statements.

**SQL Descriptor Area (SQLDA).** A structure that describes input variables, output variables, or the columns of a result table.

**SQL escape character.** The symbol used to enclose an SQL delimited identifier. This symbol is the quotation mark ("). See *escape character*.

**SQL return code.** Either SQLCODE or SQLSTATE.

**SQL string delimiter.** A symbol used to enclose an SQL string constant. The SQL string delimiter is the apostrophe ('), except in COBOL applications, in which case the symbol (either an apostrophe or a quotation mark) may be assigned by the user.

**SQLCA.** SQL communication area.

**SQLDA.** SQL descriptor area.

**SQL/DS.** SQL/Data System. Also known as *DB2/VSE & VM*.

**SSI.** MVS subsystem interface.

**SSM.** Subsystem member.

**stand-alone.** An attribute of a program that means it is capable of executing separately from DB2, without using DB2 services.

**static SQL.** SQL statements, embedded within a program, that are prepared during the program preparation process (before the program is executed). After being prepared, the SQL statement does not change (although values of host variables specified by the statement might change).

**storage group.** A named set of DASD volumes on which DB2 data can be stored.

**stored procedure.** A user-written application program, that can be invoked through the use of the SQL CALL statement.

**string.** See *character string* or *graphic string*.

**Structured Query Language (SQL).** A standardized language for defining and manipulating data in a relational database.

**subsystem.** A distinct instance of a RDBMS.

**sync point.** See *commit point*.

**synonym.** In SQL, an alternative name for a table or view. Synonyms can only be used to refer to objects at the subsystem in which the synonym is defined.

**system administrator.** The person having the second highest level of authority within DB2. System administrators make decisions about how DB2 is to be used and implement those decisions by choosing system parameters. They monitor the system and change its characteristics to meet changing requirements and new data processing goals.

**system agent.** A work request that DB2 creates internally.

**system conversation.** The conversation that two DB2s must establish to process system messages before any distributed processing can begin.

**Systems Network Architecture (SNA).** The description of the logical structure, formats, protocols, and operational sequences for transmitting information through and controlling the configuration and operation of networks.

## T

**table.** A named data object consisting of a specific number of columns and some number of unordered rows. Synonymous with *base table* or *temporary table*.

**table check constraint.** A user-defined constraint that specifies the values that specific columns of a base table can contain.

**table space.** A page set used to store the records in one or more tables.

**table space set.** A set of table spaces and partitions that should be recovered together because each of them contains a table that is a parent or descendent of a table in one of the others.

**task control block (TCB).** A control block used to communicate information about tasks within an address space that are connected to DB2. An address space can support many task connections (as many as one per task), but only one address space connection. See *address space connection*.

**TCB.** MVS task control block.

**temporary table.** A table created by the SQL CREATE GLOBAL TEMPORARY TABLE statement that is used to hold temporary data. Contrast with *result table* and *temporary table*.

**thread.** The DB2 structure that describes an application's connection, traces its progress, processes

resource functions, and delimits its accessibility to DB2 resources and services. Most DB2 functions execute under a thread structure. See also *allied thread* and *database access thread*.

**three-part name.** The full name of a table, view, or alias. It consists of a location name, authorization ID, and an object name separated by a period.

**time.** A three-part value that designates a time of day in hours, minutes, and seconds.

**time duration.** A decimal integer that represents a number of hours, minutes, and seconds.

**time-sharing option (TSO).** Provides interactive time sharing from remote terminals.

**timestamp.** A seven-part value that consists of a date and time expressed in years, months, days, hours, minutes, seconds, and microseconds.

**TMP.** Terminal Monitor Program.

**trace.** A DB2 facility that provides the ability to monitor and collect DB2 monitoring, auditing, performance, accounting, statistics, and serviceability (global) data.

**transaction lock.** A lock used to control concurrent execution of SQL statements.

**TSO.** Time-sharing option.

**TSO attachment facility.** A DB2 facility consisting of the DSN command processor and DB2I. Applications that are not written for the CICS or IMS environments can run under the TSO attachment facility.

**type 1 indexes.** Indexes that were created by a release of DB2 before DB2 Version 4 or that are specified as type 1 indexes in Version 4. Contrast with *type 2 indexes*.

**type 2 indexes.** A new type of indexes available in Version 4. They differ from *type 1 indexes* in several respects; for example, they are the only indexes allowed on a table space that uses *row locks*.

## U

**uncommitted read (UR).** The isolation level that allows an application to read uncommitted data.

**undo.** A state of a unit of recovery that indicates that the changes made by the unit of recovery to recoverable DB2 resources must be backed out.

**unique index.** An index which ensures that no identical key values are stored in a table.

**uniqueness constraint.** The rule that no two values in a primary key or key of a unique index can be the same.

**unit of recovery.** A recoverable sequence of operations within a single resource manager, such as an instance of DB2. Contrast with *unit of work*.

**unit of work.** A recoverable sequence of operations within an application process. At any time, an application process is a single unit of work, but the life of an application process can involve many units of work as a result of commit or rollback operations. In a *multi-site update* operation, a single unit of work can include several *units of recovery*.

**URID (unit of recovery ID).** The LOGRBA of the first log record for a unit of recovery. The URID also appears in all subsequent log records for that unit of recovery.

**UT.** Utility-only access.

## V

**value.** The smallest unit of data manipulated in SQL.

**variable.** A data element that specifies a value that can be changed. A COBOL elementary data item is an example of a variable. Contrast with *constant*.

**varying-length string.** A character or graphic string whose length varies within set limits. Contrast with *fixed-length string*.

**version.** A member of a set of similar programs, DBRMs, or packages.

**A version of a program** is the source code produced by precompiling the program. The program version is identified by the program name and a timestamp (consistency token).

**A version of a DBRM** is the DBRM produced by precompiling a program. The DBRM version is identified by the same program name and timestamp as a corresponding program version.

**A version of a package** is the result of binding a DBRM within a particular database system. The package version is identified by the same program name and consistency token as the DBRM.

**view.** An alternative representation of data from one or more tables. A view can include all or some of the columns contained in tables on which it is defined.

**Virtual Telecommunications Access Method (VTAM).** An IBM licensed program that controls communication and the flow of data in an SNA network.

**VSAM.** Virtual storage access method.

**VTAM.** MVS Virtual telecommunication access method.

## W

**warm start.** The normal DB2 restart process which involves reading and processing log records so that data under the control of DB2 is consistent. Contrast with *cold start*.

## X

**XCF.** See *cross-system coupling facility*.



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# Bibliography

## DB2 for OS/390 Version 5

- *Administration Guide*, SC26-8957
- *Application Programming and SQL Guide*, SC26-8958
- *Call Level Interface Guide and Reference*, SC26-8959
- *Command Reference*, SC26-8960
- *Data Sharing: Planning and Administration*, SC26-8961
- *Data Sharing Quick Reference Card*, SX26-3841
- *Diagnosis Guide and Reference*, LY27-9659
- *Diagnostic Quick Reference Card*, LY27-9660
- *Installation Guide*, GC26-8970
- *Application Programming Guide and Reference for Java™*, SC26-9547
- *Licensed Program Specifications*, GC26-8969
- *Messages and Codes*, GC26-8979
- *Reference for Remote DRDA Requesters and Servers*, SC26-8964
- *Reference Summary*, SX26-3842
- *Release Guide*, SC26-8965
- *SQL Reference*, SC26-8966
- *Utility Guide and Reference*, SC26-8967
- *What's New?*, GC26-8971
- *Program Directory*

## DB2 PM for OS/390 Version 5

- *Batch User's Guide*, SC26-8991
- *Command Reference*, SC26-8987
- *General Information*, GC26-8982
- *Getting Started on the Workstation*, SC26-8989
- *Master Index*, SC26-8984
- *Messages Manual*, SC26-8988
- *Online Monitor User's Guide*, SC26-8990
- *Report Reference Volume 1*, SC26-8985
- *Report Reference Volume 2*, SC26-8986
- *Program Directory*

## Ada/370

- *IBM Ada/370 Language Reference*, SC09-1297
- *IBM Ada/370 Programmer's Guide*, SC09-1414
- *IBM Ada/370 SQL Module Processor for DB2 Database Manager User's Guide*, SC09-1450

## APL2

- *APL2 Programming Guide*, SH21-1072
- *APL2 Programming: Language Reference*, SH21-1061
- *APL2 Programming: Using Structured Query Language (SQL)*, SH21-1057

## AS/400

- *DB2 for OS/400 SQL Programming*, SC41-4611
- *DB2 for OS/400 SQL Reference*, SC41-4612

## BASIC

- *IBM BASIC/MVS Language Reference*, GC26-4026
- *IBM BASIC/MVS Programming Guide*, SC26-4027

## C/370

- *IBM SAA AD/Cycle C/370 Programming Guide*, SC09-1356
- *IBM SAA AD/Cycle C/370 Programming Guide for Language Environment/370*, SC09-1840
- *IBM SAA AD/Cycle C/370 User's Guide*, SC09-1763
- *SAA CPI C Reference*, SC09-1308

## Character Data Representation Architecture

- *Character Data Representation Architecture Overview*, GC09-2207
- *Character Data Representation Architecture Reference*, SC09-2190

## CICS/ESA

- *CICS/ESA Application Programming Guide*, SC33-1169
- *CICS/ESA Application Programming Reference*, SC33-1170
- *CICS/ESA CICS - RACF Security Guide*, SC33-1185
- *CICS/ESA CICS-Supplied Transactions*, SC33-1168
- *CICS/ESA Customization Guide*, SC33-1165
- *CICS/ESA Data Areas*, LY33-6083
- *CICS/ESA Installation Guide*, SC33-1163
- *CICS/ESA Intercommunication Guide*, SC33-1181
- *CICS/ESA Messages and Codes*, SC33-1177
- *CICS/ESA Operations and Utilities Guide*, SC33-1167
- *CICS/ESA Performance Guide*, SC33-1183
- *CICS/ESA Problem Determination Guide*, SC33-1176
- *CICS/ESA Resource Definition Guide*, SC33-1166
- *CICS/ESA System Definition Guide*, SC33-1164
- *CICS/ESA System Programming Reference*, GC33-1171

## CICS/MVS

- *CICS/MVS Application Programming Primer*, SC33-0139
- *CICS/MVS Application Programmer's Reference*, SC33-0512
- *CICS/MVS Facilities and Planning Guide*, SC33-0504
- *CICS/MVS Installation Guide*, SC33-0506
- *CICS/MVS Operations Guide*, SC33-0510
- *CICS/MVS Problem Determination Guide*, SC33-0516
- *CICS/MVS Resource Definition (Macro)*, SC33-0509
- *CICS/MVS Resource Definition (Online)*, SC33-0508

## IBM C/C++ for MVS/ESA or OS/390

- *IBM C/C++ for MVS/ESA Library Reference*, SC09-1995
- *IBM C/C++ for MVS/ESA Programming Guide*, SC09-1994
- *IBM C/C++ for OS/390 User's Guide*, SC09-2361

## IBM COBOL for MVS & VM

- *IBM COBOL for MVS & VM Language Reference*, SC26-4769
- *IBM COBOL for MVS & VM Programming Guide*, SC26-4767

## Conversion Guides

- *DBMS Conversion Guide: DATACOM/DB to DB2*, GH20-7564
- *DBMS Conversion Guide: IDMS to DB2*, GH20-7562
- *DBMS Conversion Guide: Model 204 to DB2 or SQL/DS*, GH20-7565
- *DBMS Conversion Guide: VSAM to DB2*, GH20-7566
- *IMS-DB and DB2 Migration and Coexistence Guide*, GH21-1083

## Cooperative Development Environment

- *CoOperative Development Environment/370: Debug Tool*, SC09-1623

## DATABASE 2 for Common Servers

- *DATABASE 2 Administration Guide for common servers*, S20H-4580
- *DATABASE 2 Application Programming Guide for common servers*, S20H-4643
- *DATABASE 2 Software Developer's Kit for AIX: Building Your Applications*, S20H-4780
- *DATABASE 2 Software Developer's Kit for OS/2: Building Your Applications*, S20H-4787
- *DATABASE 2 SQL Reference for common servers*, S20H-4665
- *DATABASE 2 Call Level Interface Guide and Reference for common servers*, S20H-4644

## Data Extract (DXT)

- *Data Extract Version 2: General Information*, GC26-4666
- *Data Extract Version 2: Planning and Administration Guide*, SC26-4631

## DataPropagator NonRelational

- *DataPropagator NonRelational MVS/ESA Administration Guide*, SH19-5036
- *DataPropagator NonRelational MVS/ESA Reference*, SH19-5039

## DataPropagator Relational

- *DataPropagator Relational User's Guide*, SC26-3399
- *IBM An Introduction to DataPropagator Relational*, GC26-3398

## Data Facility Data Set Services

- *Data Facility Data Set Services: User's Guide and Reference*, SC26-4125

## Database Design

- *DB2 Database Design and Implementation Using DB2*, SH24-6101
- *DB2 Design and Development Guide*, Gabrielle Wiorkowski and David Kull, Addison Wesley
- *Handbook of Relational Database Design*, C. Fleming and B Von Halle, Addison Wesley
- *Principles of Database Systems*, Jeffrey D. Ullman, Computer Science Press

## DataHub

- *IBM DataHub General Information*, GC26-4874

## DB2 Universal Database

- *DB2 Universal Database Administration Guide*, S10J-8157
- *DB2 Universal Database API Reference*, S10J-8167
- *DB2 Universal Database Building Applications for UNIX Environments*, S10J-8161
- *DB2 Universal Database Building Applications for Windows and OS/2 Environments*, S10J-8160
- *DB2 Universal Database CLI Guide and Reference*, S10J-8159
- *DB2 Universal Database SQL Reference*, S10J-8165

## Device Support Facilities

- *Device Support Facilities User's Guide and Reference*, GC35-0033

## DFSMS/MVS

- *DFSMS/MVS: Access Method Services for the Integrated Catalog*, SC26-4906

- *DFSMS/MVS: Access Method Services for VSAM Catalogs*, SC26-4905
- *DFSMS/MVS: Administration Reference for DFSMSdss*, SC26-4929
- *DFSMS/MVS: DFSMSShsm Managing Your Own Data*, SH21-1077
- *DFSMS/MVS: Diagnosis Reference for DFSMSdftp*, LY27-9606
- *DFSMS/MVS: Macro Instructions for Data Sets*, SC26-4913
- *DFSMS/MVS: Managing Catalogs*, SC26-4914
- *DFSMS/MVS: Program Management*, SC26-4916
- *DFSMS/MVS: Storage Administration Reference for DFSMSdftp*, SC26-4920
- *DFSMS/MVS: Using Advanced Services for Data Sets*, SC26-4921
- *DFSMS/MVS: Utilities*, SC26-4926
- *MVS/DFP: Managing Non-VSAM Data Sets*, SC26-4557

#### **DFSORT**

- *DFSORT Application Programming: Guide*, SC33-4035

#### **Distributed Relational Database**

- *Data Stream and OPA Reference*, SC31-6806
- *Distributed Relational Database Architecture: Application Programming Guide*, SC26-4773
- *Distributed Relational Database Architecture: Connectivity Guide*, SC26-4783
- *Distributed Relational Database Architecture: Evaluation and Planning Guide*, SC26-4650
- *Distributed Relational Database Architecture: Problem Determination Guide*, SC26-4782
- *Distributed Relational Database: Every Manager's Guide*, GC26-3195
- *IBM SQL Reference*, SC26-8416
- *Open Group Technical Standard (the Open Group presently makes the following books available through their website at [www.opengroup.org](http://www.opengroup.org)):*
  - *DRDA Volume 1: Distributed Relational Database Architecture (DRDA)*, ISBN 1-85912-295-7
  - *DRDA Volume 3: Distributed Database Management (DDM) Architecture*, ISBN 1-85912-206-X

#### **Education**

- *Dictionary of Computing*, SC20-1699
- *IBM Enterprise Systems Training Solutions Catalog*, GR28-5467

#### **Enterprise System/9000 and Enterprise System/3090**

- *Enterprise System/9000 and Enterprise System/3090 Processor Resource/System Manager Planning Guide*, GA22-7123

#### **FORTRAN**

- *VS FORTRAN Version 2: Language and Library Reference*, SC26-4221
- *VS FORTRAN Version 2: Programming Guide for CMS and MVS*, SC26-4222

#### **High Level Assembler**

- *High Level Assembler/MVS and VM and VSE Language Reference*, SC26-4940
- *High Level Assembler/MVS and VM and VSE Programmer's Guide*, SC26-4941

#### **Parallel Sysplex Library**

- *System/390 MVS Sysplex Application Migration*, GC28-1211
- *System/390 MVS Sysplex Hardware and Software Migration*, GC28-1210
- *System/390 MVS Sysplex Overview: An Introduction to Data Sharing and Parallelism*, GC28-1208
- *System/390 MVS Sysplex Systems Management*, GC28-1209
- *System/390 MVS 9672/9674 System Overview*, GA22-7148

#### **ICSF/MVS**

- *ICSF/MVS General Information*, GC23-0093

#### **IMS/ESA**

- *IMS Batch Terminal Simulator General Information*, GH20-5522
- *IMS/ESA Administration Guide: System*, SC26-8013
- *IMS/ESA Application Programming: Database Manager*, SC26-8727
- *IMS/ESA Application Programming: Design Guide*, SC26-8016
- *IMS/ESA Application Programming: Transaction Manager*, SC26-8729
- *IMS/ESA Customization Guide*, SC26-8020
- *IMS/ESA Installation Volume 1: Installation and Verification*, SC26-8023
- *IMS/ESA Installation Volume 2: System Definition and Tailoring*, SC26-8024
- *IMS/ESA Messages and Codes*, SC26-8028
- *IMS/ESA Operator's Reference*, SC26-8030
- *IMS/ESA Utilities Reference: System*, SC26-8035

#### **ISPF**

- *ISPF Version 4 Messages and Codes*, SC34-4450
- *ISPF Version 4 for MVS Dialog Management Guide*, SC34-4213
- *ISPF/PDF Version 4 for MVS Guide and Reference*, SC34-4258
- *ISPF and ISPF/PDF Version 4 for MVS Planning and Customization*, SC34-4134

## Language Environment for MVS & VM

- *Language Environment for MVS & VM Concepts Guide, GC26-4786*
- *Language Environment for MVS & VM Debugging and Run-Time Messages Guide, SC26-4829*
- *Language Environment for MVS & VM Installation and Customization, SC26-4817*
- *Language Environment for MVS & VM Programming Guide, SC26-4818*
- *Language Environment for MVS & VM Programming Reference, SC26-3312*

## MVS/ESA

- *MVS/ESA Analyzing Resource Measurement Facility Monitor I and Monitor II Reference and User's Guide, LY28-1007*
- *MVS/ESA Analyzing Resource Measurement Facility Monitor III Reference and User's Guide, LY28-1008*
- *MVS/ESA Application Development Reference: Assembler Callable Services for OpenEdition MVS, SC23-3020*
- *MVS/ESA Data Administration: Utilities, SC26-4516*
- *MVS/ESA Diagnosis: Procedures, LY28-1844*
- *MVS/ESA Diagnosis: Tools and Service Aids, LY28-1845*
- *MVS/ESA Initialization and Tuning Guide, SC28-1451*
- *MVS/ESA Initialization and Tuning Reference, SC28-1452*
- *MVS/ESA Installation Exits, SC28-1459*
- *MVS/ESA JCL Reference, GC28-1479*
- *MVS/ESA JCL User's Guide, GC28-1473*
- *MVS/ESA JES2 Initialization and Tuning Guide, SC28-1453*
- *MVS/ESA MVS Configuration Program, GC28-1615*
- *MVS/ESA Planning: Global Resource Serialization, GC28-1450*
- *MVS/ESA Planning: Operations, GC28-1441*
- *MVS/ESA Planning: Workload Management, GC28-1493*
- *MVS/ESA Programming: Assembler Services Guide, GC28-1466*
- *MVS/ESA Programming: Assembler Services Reference, GC28-1474*
- *MVS/ESA Programming: Authorized Assembler Services Guide, GC28-1467*
- *MVS/ESA Programming: Authorized Assembler Services Reference, Volumes 1-4, GC28-1475, GC28-1476, GC28-1477, GC28-1478*
- *MVS/ESA Programming: Extended Addressability Guide, GC28-1468*
- *MVS/ESA Programming: Sysplex Services Guide, GC28-1495*
- *MVS/ESA Programming: Sysplex Services Reference, GC28-1496*
- *MVS/ESA Programming: Workload Management Services, GC28-1494*

- *MVS/ESA Routing and Descriptor Codes, GC28-1487*
- *MVS/ESA Setting Up a Sysplex, GC28-1449*
- *MVS/ESA SPL: Application Development Guide, GC28-1852*
- *MVS/ESA System Codes, GC28-1486*
- *MVS/ESA System Commands, GC28-1442*
- *MVS/ESA System Management Facilities (SMF), GC28-1457*
- *MVS/ESA System Messages Volume 1, GC28-1480*
- *MVS/ESA System Messages Volume 2, GC28-1481*
- *MVS/ESA System Messages Volume 3, GC28-1482*
- *MVS/ESA Using the Subsystem Interface, SC28-1502*

## Net.Data for OS/390

- # • *Net.Data Language Environment Guide, <http://www.ibm.com/software/net.data/docs>*
- # • *Net.Data Programming Guide, <http://www.ibm.com/software/net.data/docs>*
- # • *Net.Data Reference Guide, <http://www.ibm.com/software/net.data/docs>*

## NetView

- *NetView Installation and Administration Guide, SC31-8043*
- *NetView User's Guide, SC31-8056*

## ODBC

- *ODBC 2.0 Programmer's Reference and SDK Guide, ISBN 1-55615-658-8*
- *Inside ODBC, ISBN 1-55615-815-7*

## OS/390

- *OS/390 C/C++ Programming Guide, SC09-2362*
- *OS/390 C/C++ Run-Time Library Reference, SC28-1663*
- *OS/390 Information Roadmap, GC28-1727*
- *OS/390 Introduction and Release Guide, GC28-1725*
- *OS/390 JES2 Initialization and Tuning Guide, SC28-1791*
- *OS/390 JES3 Initialization and Tuning Guide, SC28-1802*
- *OS/390 Language Environment for OS/390 & VM Concepts Guide, GC28-1945*
- *OS/390 Language Environment for OS/390 & VM Customization, SC28-1941*
- *OS/390 Language Environment for OS/390 & VM Debugging Guide, SC28-1942*
- *OS/390 Language Environment for OS/390 & VM Programming Guide, SC28-1939*
- *OS/390 Language Environment for OS/390 & VM Programming Reference, SC28-1940*
- *OS/390 MVS Diagnosis: Procedures, LY28-1082*
- *OS/390 MVS Diagnosis: Tools and Service Aids, LY28-1085*

- *OS/390 MVS Initialization and Tuning Guide*, SC28-1751
- *OS/390 MVS Initialization and Tuning Reference*, SC28-1752
- *OS/390 MVS Installation Exits*, SC28-1753
- *OS/390 MVS JCL Reference*, GC28-1757
- *OS/390 MVS JCL User's Guide*, GC28-1758
- *OS/390 MVS Planning: Global Resource Serialization*, GC28-1759
- *OS/390 MVS Planning: Operations*, GC28-1760
- *OS/390 MVS Planning: Workload Management*, GC28-1761
- *OS/390 MVS Programming: Assembler Services Guide*, GC28-1762
- *OS/390 MVS Programming: Assembler Services Reference*, GC28-1910
- *OS/390 MVS Programming: Authorized Assembler Services Guide*, GC28-1763
- *OS/390 MVS Programming: Authorized Assembler Services Reference, Volumes 1-4*, GC28-1764, GC28-1765, GC28-1766, GC28-1767
- *OS/390 MVS Programming: Callable Services for High-Level Languages*, GC28-1768
- *OS/390 MVS Programming: Extended Addressability Guide*, GC28-1769
- *OS/390 MVS Programming: Sysplex Services Guide*, GC28-1771
- *OS/390 MVS Programming: Sysplex Services Reference*, GC28-1772
- *OS/390 MVS Programming: Workload Management Services*, GC28-1773
- *OS/390 MVS Routing and Descriptor Codes*, GC28-1778
- *OS/390 MVS Setting Up a Sysplex*, GC28-1779
- *OS/390 MVS System Codes*, GC28-1780
- *OS/390 MVS System Commands*, GC28-1781
- *OS/390 MVS System Messages Volume 1*, GC28-1784
- *OS/390 MVS System Messages Volume 2*, GC28-1785
- *OS/390 MVS System Messages Volume 3*, GC28-1786
- *OS/390 MVS System Messages Volume 4*, GC28-1787
- *OS/390 MVS System Messages Volume 5*, GC28-1788
- *OS/390 Security Server (RACF) Auditor's Guide*, SC28-1916
- *OS/390 Security Server (RACF) Command Language Reference*, SC28-1919
- *OS/390 Security Server (RACF) General User's Guide*, SC28-1917
- *OS/390 Security Server (RACF) Security Administrator's Guide*, SC28-1915
- *OS/390 Security Server (RACF) System Programmer's Guide*, SC28-1913
- *OS/390 SMP/E Reference*, SC28-1806
- *OS/390 SMP/E User's Guide*, SC28-1740
- *OS/390 RMF User's Guide*, SC28-1949

- *OS/390 TSO/E CLISTS*, SC28-1973
- *OS/390 TSO/E Command Reference*, SC28-1969
- *OS/390 TSO/E Customization*, SC28-1965
- *OS/390 TSO/E Messages*, GC28-1978
- *OS/390 TSO/E Programming Guide*, SC28-1970
- *OS/390 TSO/E Programming Services*, SC28-1971
- *OS/390 TSO/E REXX Reference*, SC28-1975
- *OS/390 TSO/E User's Guide*, SC28-1968

#### **OS/390 OpenEdition**

- *OS/390 OpenEdition DCE Administration Guide*, SC28-1584
- *OS/390 OpenEdition DCE Introduction*, GC28-1581
- *OS/390 R1 OE DCE Messages and Codes*, ST01-0920
- *OS/390 OpenEdition Command Reference*, SC28-1892
- *OS/390 OpenEdition Messages and Codes*, SC28-1908
- *OS/390 OpenEdition Planning*, SC28-1890
- *OS/390 OpenEdition User's Guide*, SC28-1891

#### **PL/I for MVS & VM**

- *IBM PL/I MVS & VM Language Reference*, SC26-3114
- *IBM PL/I MVS & VM Programming Guide*, SC26-3113

#### **OS PL/I**

- *OS PL/I Programming Language Reference*, SC26-4308
- *OS PL/I Programming Guide*, SC26-4307

#### **PROLOG**

- *IBM SAA AD/Cycle Prolog/MVS & VM Programmer's Guide*, SH19-6892

#### **Query Management Facility**

- *Query Management Facility: Managing QMF for MVS*, SC26-8218
- *Query Management Facility: Reference*, SC26-4716
- *Query Management Facility: Using QMF*, SC26-8078

#### **Remote Recovery Data Facility**

- *Remote Recovery Data Facility Program Description and Operations*, LY37-3710

#### **Resource Access Control Facility (RACF)**

- *External Security Interface (RACROUTE) Macro Reference for MVS and VM*, GC28-1366
- *Resource Access Control Facility (RACF) Auditor's Guide*, SC28-1342
- *Resource Access Control Facility (RACF) Command Language Reference*, SC28-0733
- *Resource Access Control Facility (RACF) General Information Manual*, GC28-0722

- *Resource Access Control Facility (RACF) General User's Guide, SC28-1341*
- *Resource Access Control Facility (RACF) Security Administrator's Guide, SC28-1340*
- *Resource Access Control Facility (RACF) System Programmer's Guide, SC28-1343*

### **Storage Management**

- *MVS/ESA Storage Management Library: Implementing System-Managed Storage, SC26-3123*
- *MVS/ESA Storage Management Library: Leading an Effective Storage Administration Group, SC26-3126*
- *MVS/ESA Storage Management Library: Managing Data, SC26-3124*
- *MVS/ESA Storage Management Library: Managing Storage Groups, SC26-3125*
- *MVS Storage Management Library: Storage Management Subsystem Migration Planning Guide, SC26-4659*

### **System/370 and System/390**

- *IBM System/370 ESA Principles of Operation, SA22-7200*
- *IBM System/390 ESA Principles of Operation, SA22-7205*
- *System/390 MVS Sysplex Hardware and Software Migration, GC28-1210*

### **System Modification Program Extended (SMP/E)**

- *System Modification Program Extended (SMP/E) Reference, SC28-1107*
- *System Modification Program Extended (SMP/E) User's Guide, SC28-1302*

### **System Network Architecture (SNA)**

- *SNA Formats, GA27-3136*
- *SNA LU 6.2 Peer Protocols Reference, SC31-6808*
- *SNA Transaction Programmer's Reference Manual for LU Type 6.2, GC30-3084*
- *SNA/Management Services Alert Implementation Guide, GC31-6809*

### **TCP/IP**

- *IBM TCP/IP for MVS: Customization & Administration Guide, SC31-7134*
- *IBM TCP/IP for MVS: Diagnosis Guide, LY43-0105*
- *IBM TCP/IP for MVS: Messages and Codes, SC31-7132*
- *IBM TCP/IP for MVS: Planning and Migration Guide, SC31-7189*

### **TSO Extensions**

- *TSO/E CLISTS, SC28-1876*
- *TSO/E Command Reference, SC28-1881*
- *TSO/E Customization, SC28-1872*
- *TSO/E Messages, GC28-1885*
- *TSO/E Programming Guide, SC28-1874*
- *TSO/E Programming Services, SC28-1875*
- *TSO/E User's Guide, SC28-1880*

### **VS COBOL II**

- *VS COBOL II Application Programming Guide for MVS and CMS, SC26-4045*
- *VS COBOL II Application Programming: Language Reference, SC26-4047*
- *VS COBOL II Installation and Customization for MVS, SC26-4048*

### **VTAM**

- *Planning for NetView, NCP, and VTAM, SC31-8063*
- *VTAM for MVS/ESA Diagnosis, LY43-0069*
- *VTAM for MVS/ESA Messages and Codes, SC31-6546*
- *VTAM for MVS/ESA Network Implementation Guide, SC31-6548*
- *VTAM for MVS/ESA Operation, SC31-6549*
- *VTAM for MVS/ESA Programming, SC31-6550*
- *VTAM for MVS/ESA Programming for LU 6.2, SC31-6551*
- *VTAM for MVS/ESA Resource Definition Reference, SC31-6552*

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# Index

## Special Characters

- ' (apostrophe) in DB2 commands 22
- , (comma) in DB2 commands 22
- : (colon) in DB2 commands 23
- " (quotation mark) in DB2 commands 22
- () (parentheses) in DB2 commands 23
- \* (asterisk)
  - DISPLAY PROCEDURE command 139
  - DISPLAY THREAD command 144
  - FREE PACKAGE command 205
  - REBIND PACKAGE command 76
  - START PROCEDURE command 264
  - STOP PROCEDURE command 291
- = (equal sign) in DB2 commands 22

## A

- ABEND
  - subcommand of DSN 163
- ACCESS option
  - START DATABASE command 251
  - START DB2 command 256
- accounting
  - trace
    - class descriptions 272
    - displaying 154
    - starting 268
    - stopping 294
- ACCTG option
  - DISPLAY TRACE command 156
  - MODIFY TRACE command 222
  - START TRACE command 269
  - STOP TRACE command 296
- ACQUIRE
  - option of BIND PLAN subcommand
    - description 56
  - option of DSNH command 193
  - option of REBIND PLAN subcommand 56
- ACTION option
  - BIND PACKAGE subcommand 57
  - BIND PLAN subcommand 57
  - DCLGEN subcommand 89
  - DSNH command 193
  - RECOVER INDOUBT command 233
  - STOP PROCEDURE command 291
- ACTIVE option
  - DISPLAY BUFFERPOOL command 100
  - DISPLAY DATABASE command 111
  - DISPLAY THREAD command 144
- ADD
  - option of DCLGEN subcommand 89
- ADD (*continued*)
  - option of DSNH command 196
- AFTER option
  - DISPLAY DATABASE command 111
- ALLD option of MODIFY irlmproc,STATUS command of MVS 215
- ALLI option of MODIFY irlmproc,STATUS command of MVS 216
- ALTER BUFFERPOOL command
  - description 29
  - example 33
  - option descriptions 29
- ALTER GROUPBUFFERPOOL command
  - description 34
  - example 36
  - option descriptions 34
- ALTER UTILITY command
  - description 37
  - example 39
- ambiguous cursor 60
- APOST option
  - DCLGEN subcommand 90
  - of DSNH command 186
- APOSTSQL option
  - DSNH command 191
- application plan
  - binding 51
  - deleting 207
  - maximum size 18
  - rebinding
    - changing plans 227
- application program
  - preparation
    - DSNH CLIST processing 178
    - START command 248
    - testing 163
- ARCHIVE LOG command
  - description 40
  - example 44
  - option descriptions 41
- ASMLIB option of DSNH command 181
- ASMLoad option of DSNH command 181
- asterisk (\*)
  - DISPLAY PROCEDURE command 139
  - DISPLAY THREAD command 144
  - FREE PACKAGE command 205
  - in DB2 commands 23
  - REBIND PACKAGE command 76
  - START PROCEDURE command 264
  - STOP PROCEDURE command 291
- AT option of DCLGEN subcommand 88

AT(COMMIT) option of STOP DATABASE command 281

AUDIT

- option of DISPLAY TRACE command 156
- option of MODIFY TRACE command 222
- option of START TRACE command 270
- option of STOP TRACE command 296

audit trace

- class descriptions 272
- displaying 154
- starting 268
- stopping 294

AUTHID

- option of DISPLAY TRACE command 157
- option of START TRACE command 272
- option of STOP TRACE command 296

authorization ID

- naming convention 14
- secondary
  - privileges 17
- SQL
  - privileges exercised by 17

AUTOREC option of ALTER GROUPBUFFERPOOL command 35

## B

BDBRMLIB

- option of DSNH command 194

BDMEM

- option of DSNH command 193

BIND PACKAGE subcommand of DSN

- description 46
- example 50
- option descriptions 56

BIND PLAN subcommand of DSN

- description 51
- example 54
- option descriptions 56

binding

- DSNH processing 178
- initiating 46, 51
- options for 56

blank

- characters in DB2 command 22

BLIB option of DSNH command 193

BMEM option of DSNH command 194

BnLIB option of DSNH command 194

BSDS (bootstrap data set)

- recovery 231

buffer pool

- active and inactive 29, 100
- altering attributes 29
- displaying current status 100

BUFSIZE option of START TRACE command 275

## C

C option

- DCLGEN subcommand 89

CACHESIZE

- option of BIND PLAN subcommand 58
- option of DSNH command 194
- option of REBIND PLAN subcommand 58

CANCEL OFFLOAD option of ARCHIVE LOG command 43

CANCEL THREAD command

- description 81
- example 83
- option descriptions 81

canceling threads

- description 81

CASTOUT option of ALTER BUFFERPOOL command 31

CATMAINT utility

- effects of TERM command 300

CCLINK option of DSNH command 182

CCLLIB option of DSNH command 182

CCLOAD option of DSNH command 182

CCMSGS option of DSNH command 182

CCOLIB option of DSNH command 182

CCPLIB option of DSNH command 182

CCPMMSG option of DSNH command 182

CCSLIB option of DSNH command 182

CD-ROM, books on 5

CHANGE command of IMS

- description 85
- example 86

character 14

CHECK DATA utility

- effects of TERM command 300

CHECK INDEX utility

- effects of TERM command 300

CICS

- commands
  - DSNC 166
  - DSNC DISCONNECT 167, 168
  - DSNC DISPLAY 169, 172
  - DSNC MODIFY 173, 174
  - DSNC STOP 175
  - DSNC STRT 176, 177
- translation step in DSNH processing 178

CICS option

- BIND and REBIND subcommands 65
- DSNH command 190, 194

CICSCOB option of DSNH command 183

CICSLLIB option of DSNH command 182

CICSOPT option of DSNH command 182

CICSPLIB option of DSNH command 183

CICSPRE option of DSNH command 182

CICSVER option of DSNH command 183



CICSXLAT option of DSNH command 183  
 CLAIMERS option of DISPLAY DATABASE  
 command 111  
 CLASS option  
   DISPLAY TRACE command 157  
   IFCIDs activated by trace class 272  
   MODIFY TRACE command 222  
   START TRACE command 272  
   STOP TRACE command 297  
 CLASST option of ALTER GROUPBUFFERPOOL  
 command 35  
 CLIB option of DSNH command 183  
 CnLIB option of DSNH command 183  
 COB2 option  
   DCLGEN subcommand 89  
 COB2CICS option of DSNH command 183  
 COB2LIB option of DSNH command 184  
 COB2LOAD option of DSNH command 184  
 COBICOMP option of DSNH command 183  
 COBILINK option of DSNH command 183  
 COBIPLNK option of DSNH command 183  
 COBIPMSG option of DSNH command 183  
 COBLIB option of DSNH command 183  
 COBLOAD option of DSNH command 183  
 COBOL option  
   DCLGEN subcommand 89  
 COBSOM option of DSNH command 183  
 code, return 165  
   *See also* return code  
 collection, package  
   BIND PACKAGE subcommand 76  
   ID naming convention 14  
   REBIND PACKAGE subcommand 76  
 COLSUFFIX option of DCLGEN subcommand  
 description 91  
 column  
   name  
     as a field name 91  
 Comma option of DSNH command 186  
 command continuation character 24  
 command prefix  
   description 21  
   multiple subsystems 256  
   part of a command 21  
 command recognition character (CRC) 21  
   *See also* CRC (command recognition character)  
 commands  
   scope 23  
 comment  
   DCLGEN subcommand output 92  
   DSN subcommands 163  
 COMMENT option  
   DISPLAY TRACE command 156  
   MODIFY TRACE command 222  
   START TRACE command 270  
   STOP TRACE command 296  
 commit point  
   terminating utility 299  
 COMP option of TRACE CT command 305  
 COMPILE option of DSNH command 184  
 compiling 178  
   *See also* application program  
 conditional restart  
   control record  
     effect on restart 256  
 CONNECT  
   option of DSN command 184  
 connection  
   DB2  
     RETRY option of DSN command 164  
   displaying  
     connection information 142  
     group buffer pool 130  
     IRLM subsystem status 216  
     status 95  
   DSNC DISPLAY command 169  
   terminating 278  
 connection-name naming convention 14  
 CONNLIST option of DISPLAY GROUPBUFFERPOOL  
 command 124  
 CONTROL  
   option of DSNH command 184  
 COPTION option of DSNH command 184  
 COPY option  
   BIND PACKAGE subcommand 59  
   DSNH command 197  
 COPY utility  
   effects of TERM command 300  
 COPYVER option  
   BIND PACKAGE subcommand 59  
   DSNH command 197  
 correlation ID  
   naming convention 14  
   recovering threads 233  
 CORRELATION option of START TRACE  
 command 275  
 COUNT option  
   SET ARCHIVE command 243  
 CP option of RUN subcommand 240  
 CPP option  
   DCLGEN subcommand 89  
 CPPCLASS option of DSNH command 184  
 CPPCLLIB option of DSNH command 184  
 CPPCSLIB option of DSNH command 184  
 CPPLINK option of DSNH command 184  
 CPPLLIB option of DSNH command 184  
 CPPPMSG option of DSNH command 184  
 CPPSLIB option of DSNH command 185  
 CPPUTIL option of DSNH command 185  
 CPU option of START TRACE command 275  
 CRC (command recognition character)  
   description 21

CSA option of MODIFY irlmproc,SET command of MVS 213

CURRENTDATA option

- BIND PACKAGE subcommand
  - description 60
- BIND PLAN subcommand 60
- DSNH command 194, 197
- REBIND PACKAGE subcommand 60
- REBIND PLAN subcommand 60

CURRENTSERVER

- option of BIND PLAN subcommand 60
- option of DSNH command 194
- option of REBIND PLAN subcommand 60

cursor

- ambiguous 60

CYLINDER option of DSNH 191

## D

data set

- naming convention 15

data sharing

- delays
  - diagnosing 211
- displaying archive log information 98
- displaying information about groups 119
- displaying status of members 119
- identifying members with utility jobs 160
- scope of commands 23
- starting members 257

database

- displaying status 108
- reserved names 281
- starting 249
- stopping 279

DATE

- option of DSNH command 185

DB2 books on line 5

DB2 commands

- command names 22
- commands
  - ALTER BUFFERPOOL 29, 33
  - ALTER GROUPBUFFERPOOL 34, 36
  - ALTER UTILITY 37
  - ARCHIVE LOG 40, 45
  - CANCEL THREAD 81, 84
  - DISPLAY ARCHIVE 98, 99
  - DISPLAY BUFFERPOOL 100, 107
  - DISPLAY DATABASE 108
  - DISPLAY GROUP 119, 122
  - DISPLAY GROUPBUFFERPOOL 123, 133
  - DISPLAY LOCATION 134, 137
  - DISPLAY PROCEDURE 138, 140
  - DISPLAY RLIMIT 141
  - DISPLAY THREAD 142, 153
  - DISPLAY TRACE 154, 158
  - DISPLAY UTILITY 159, 162

DB2 commands (*continued*)

commands (*continued*)

- MODIFY TRACE 221, 223
- RECOVER BSDS 231
- RECOVER INDOUBT 232, 234
- RESET INDOUBT 237, 239
- START DATABASE 249
- START DB2 255, 257
- START DDF 258
- START PROCEDURE 263, 265
- START RLIMIT 266, 267
- START TRACE 268, 277
- STOP DATABASE 279, 283
- STOP DB2 284, 285
- STOP DDF 286, 287
- STOP PROCEDURE 290, 292
- STOP RLIMIT 293
- STOP TRACE 294, 298
- TERM UTILITY 299, 301

completion messages 27

description 22

entering from

- supported environments 25

scope 23

separator 22

DB2 precompiler 22

- See also* precompiler

DBM1 option of START DB2 command 256

DBRM (database request module)

- BIND PLAN subcommand 72
- maximum number in plan 18

DBRMLIB option of DSNH command 185

DCLGEN subcommand of DSNH

- declaring an indicator variable array 91
- description 87
- example 93
- forming field names 91
- option descriptions 88

DEADLINE option for ALTER UTILITY command 38

DEADLOCK option of START irlmproc command 259

DECARTH option of DSNH command 185

DECIMAL

- option of DSNH command 186

DEFAULT

- option of SET ARCHIVE command 244

DEFER

- option of BIND PACKAGE subcommand 61
- option of BIND PLAN subcommand 61
- option of DSNH command 194, 195
- option of REBIND PACKAGE subcommand 61
- option of REBIND PLAN subcommand 61

DEGREE

- option of BIND PACKAGE subcommand 62
- option of BIND PLAN subcommand 62
- option of DSNH command 194
- option of REBIND PACKAGE subcommand 62

DEGREE (*continued*)  
 option of REBIND PLAN subcommand 62  
 degree of parallel processing 62  
 DELAY keyword of MODIFY irlmproc,ABEND  
 command 211  
 DELAY option for ALTER UTILITY command 39  
 deleting  
 IMS units of recovery 85  
 DELIMIT option of DSNH command 186  
 DEST option  
 DISPLAY TRACE command 156  
 START TRACE command 270  
 STOP TRACE command 296  
 DESTINATION option of DSNH MODIFY  
 command 173  
 DETAIL option  
 DISPLAY BUFFERPOOL command 101  
 DISPLAY GROUP command 119  
 DISPLAY LOCATION command 135  
 DISPLAY THREAD command 146  
 DISPLAY TRACE command 156  
 detail report of DISPLAY BUFFERPOOL  
 command 103  
 DIAG keyword of MODIFY irlmproc,ABEND  
 command 211  
 DIAGNOSE utility  
 TERM command effects 300  
 diagnostic dumps  
 IRLM 211  
 DISABLE option  
 BIND PACKAGE subcommand 65  
 BIND PLAN subcommand 65  
 DSNH command 195  
 REBIND PACKAGE subcommand 65  
 REBIND PLAN subcommand 65  
 DISCONNECT  
 option of BIND PLAN subcommand 63  
 option of DSNH command 195  
 option of REBIND PLAN subcommand 63  
 DISPLAY  
 command of IMS  
 description 95  
 example 97  
 option descriptions 95  
 DSNH DISPLAY command 169  
 DISPLAY ARCHIVE command 98  
 DISPLAY BUFFERPOOL command  
 description 100  
 option descriptions 100  
 output 102  
 DISPLAY DATABASE command  
 description 108  
 example 114  
 option descriptions 109  
 DISPLAY GROUP command  
 description 119  
 DISPLAY GROUP command (*continued*)  
 examples 121  
 DISPLAY GROUPBUFFERPOOL command  
 description 123  
 option descriptions 123  
 output  
 group detail report 126  
 member detail report 127  
 summary report 125  
 summary report example 130  
 DISPLAY LOCATION command  
 description 134  
 example 136  
 option descriptions 134  
 DISPLAY NET command of VTAM 83  
 DISPLAY PROCEDURE command  
 description 138  
 examples 140  
 option descriptions 138  
 output 139  
 DISPLAY RLIMIT command 141  
 DISPLAY THREAD command  
 description 142  
 example 149  
 option descriptions 143  
 output 147  
 DISPLAY TRACE command  
 description 154  
 example 158  
 option descriptions 155  
 output 158  
 DISPLAY UTILITY command  
 description 159  
 example 161  
 option descriptions 159  
 output 160  
 displaying  
 information about  
 archive logs 98  
 data sharing group 119  
 DB2 threads 142  
 resource limit facility (governor) 141  
 restricted objects 113  
 stored procedures 138  
 threads with remote locations 134  
 trace activity 154  
 status of  
 buffer pools 100  
 DB2 databases 108  
 DB2 utilities 159  
 group buffer pools 123  
 DIST option of START DB2 command 256  
 DISTRIBUTED option of START TRACE  
 command 275  
 DLIBATCH option  
 BIND and REBIND subcommands 66

DLIBATCH option (*continued*)  
 DSNH command 195

DSN command of TSO  
 abbreviations 25  
 description 163  
 example 165  
 option descriptions 163  
 return codes 165  
 subcommands 25  
 ABEND 163  
 BIND PACKAGE 46, 50  
 BIND PLAN 51, 55  
 DCLGEN 87, 94  
 END 203  
 FREE PACKAGE 204, 206  
 FREE PLAN 207, 208  
 parsing 24  
 REBIND PACKAGE 224  
 REBIND PLAN 227, 230  
 return codes 165  
 RUN 240, 242  
 SPUFI 246

DSNC command of CICS  
 description 166

DSNC DISCONNECT command of CICS  
 description 167  
 example 168

DSNC DISPLAY command of CICS  
 description 169  
 example 172  
 option descriptions 169  
 output 170

DSNC MODIFY command of CICS  
 description 173  
 example 174  
 option descriptions 173

DSNC STOP command of CICS  
 description 175  
 example 175  
 option descriptions 175

DSNC STRT command of CICS  
 description 176  
 example 177  
 option descriptions 176

DSNDB01 database  
 authority needed to start 249

DSNDB06 database  
 authority needed to start 249

DSNH command of TSO  
 data set names 181  
 description 178  
 example 200  
 option descriptions 179

DSNZPARM  
 option of START DB2 command 255

DUMP  
 IRLM diagnostic 211  
 option of CANCEL THREAD command 82

DWQT option of ALTER BUFFERPOOL command 31

DYNAMICRULES  
 option of BIND PACKAGE subcommand 63  
 option of BIND PLAN subcommand 63  
 option of DSNH command 195  
 option of REBIND PACKAGE subcommand 63  
 option of REBIND PLAN subcommand 63

## E

ENABLE  
 option of BIND PACKAGE subcommand 65  
 option of BIND PLAN subcommand 65  
 option of DSNH command 195  
 option of REBIND PACKAGE subcommand 65  
 option of REBIND PLAN subcommand 65

END  
 subcommand of DSN  
 description 203  
 example 203

ENTRY option of DSNH command 186

escape character  
 APOST option of DCLGEN subcommand 90  
 QUOTE option of DCLGEN subcommand 90

executing  
 connections between IMS and a subsystem 248

EXPLAIN  
 option of BIND PACKAGE subcommand 67  
 option of BIND PLAN subcommand 67  
 option of DSNH command 195, 198  
 option of REBIND PACKAGE subcommand 67  
 option of REBIND PLAN subcommand 67

extended MCS consoles  
 DB2 support of 26

## F

F irlmproc,ABEND command of MVS 209  
*See also* MODIFY irlmproc,ABEND command of MVS

F irlmproc,DIAG,DELAY command of MVS 211  
*See also* MODIFY irlmproc,DIAG,DELAY command of MVS

F irlmproc,SET command of MVS IRLM 213  
*See also* MODIFY irlmproc,SET command of MVS

F irlmproc,STATUS command of MVS IRLM 215  
*See also* MODIFY irlmproc,STATUS command of MVS

FLAG option  
 BIND PACKAGE subcommand 68  
 BIND PLAN subcommand 68  
 DSNH command 195  
 FREE PACKAGE subcommand 205

FLAG option (*continued*)  
 FREE PLAN subcommand 207  
 of DSNH command 186  
 REBIND PACKAGE subcommand 68  
 REBIND PLAN subcommand 68

FORCE option  
 DSNH STOP command 175  
 RESET INDOUBT command 238  
 START DATABASE command 251  
 STOP DB2 command 284  
 STOP DDF command 286

FORTLIB option of DSNH command 186  
 FORTLOAD option of DSNH command 186  
 FREE PACKAGE subcommand of DSN  
 description 204  
 example 206  
 option descriptions 205

FREE PLAN subcommand of DSN  
 description 207  
 example 208  
 option descriptions 207

## G

GBPCHKPT option of ALTER GROUPBUFFERPOOL  
 command 35

GBPOOLT option of ALTER GROUPBUFFERPOOL  
 command 35

GDETAIL option of DISPLAY GROUPBUFFERPOOL  
 command 124

GLOBAL option of START irlmproc command 261

GRAPHIC option of DSNH command 186

GRECP (group buffer pool recovery pending) status  
 removing using START DATABASE command 252  
 group buffer pool recovery pending (GRECP)  
 status 252  
*See also* GRECP (&gbp. recovery pending) status  
 group detail report of DISPLAY GROUPBUFFERPOOL  
 command 126

GROUP option  
 START irlmproc command 260  
 group, scope of command 23

GTF option  
 DISPLAY TRACE command 156  
 START TRACE command 270  
 STOP TRACE command 296

## H

HOST option of DSNH command 187

HPSEQT option of ALTER BUFFERPOOL  
 command 31

HPSIZE option of ALTER BUFFERPOOL  
 command 30

## I

I/O processing  
 parallel  
 DEGREE option of bind subcommands 62

IBMCOB option  
 DCLGEN subcommand 89

ID option  
 RECOVER INDOUBT command 233  
 START RLIMIT command 266

IFCID (instrumentation facility component identifier)  
 identifiers by trace class 272

IFCID option  
 MODIFY TRACE command 222  
 START TRACE command 274

IMMEDWRITE  
 option of BIND PACKAGE subcommand 69  
 option of BIND PLAN subcommand 69  
 option of REBIND PACKAGE subcommand 69  
 option of REBIND PLAN subcommand 69

IMS  
 commands  
 CHANGE 85, 86  
 DISPLAY 95, 97  
 SSR 247  
 START 248  
 STOP 278  
 TRACE 302, 303

facilities  
 events tracing 302

IMSBMP option  
 BIND and REBIND subcommands 66  
 DSNH command 195

IMSMPP option  
 BIND and REBIND subcommands 66  
 DSNH command 195

IMSPRE option of DSNH command 187

INACTIVE option of DISPLAY THREAD command 145

INCLUDE statement  
 DCLGEN subcommand output 92

indicator variable  
 array declaration in DCLGEN 91

INDOUBT option of DISPLAY THREAD command 144

indoubt thread  
 recovering 232, 234

INDVAR option of DCLGEN subcommand  
 description 91

INPUT option of DSNH command 187

INTERVAL option of DISPLAY BUFFERPOOL  
 command 101

invalidated plans and packages 68

IPADDR  
 DISPLAY LOCATION command 135  
 RESET INDOUBT command 238

IRLM (internal resource lock manager)  
 commands  
 MODIFY irlmproc, ABEND 209

IRLM (internal resource lock manager) (*continued*)  
commands (*continued*)

- MODIFY irlmproc,DIAG,DELAY 211
- MODIFY irlmproc,SET option 213
- MODIFY irlmproc,STATUS option 215
- START irlmproc 259
- STOP irlmproc 288, 289
- TRACE CT 304

CSA

- setting maximum amount of 213

delays

- diagnosing 211

diagnostic dumps 211

restarting

- effect on CSA value 214
- effect on number of trace buffers 214

starting 259

trace buffers

- setting number of 213

IRLM (internalresource lock manager)

commands

- MODIFY irlmproc,ABEND 210

IRLMID option of START irlmproc command 260

IRLMNM option of START irlmproc command 260

ISOLATION

- option of BIND PACKAGE subcommand 70

- option of BIND PLAN subcommand

- description 70

- option of REBIND PACKAGE subcommand 70

- option of REBIND PLAN subcommand 70

## K

KEEPDYNAMIC option

- BIND PACKAGE subcommand 71

- BIND PLAN subcommand 71

- DSNH command 195

## L

LABEL

- option of DCLGEN subcommand 90

LANGUAGE

- option of DCLGEN subcommand 89

LEAVE option of DSNH command 192

letter, description in DB2 14

library

- online 5

LIBRARY option

- BIND PACKAGE subcommand 72

- BIND PLAN subcommand 72

- DCLGEN subcommand 89

- RUN subcommand 241

LIMIT option of DISPLAY DATABASE command 111

LINECOUNT option of DSNH command 187

LINK option of DSNH command 187

link-editing

- DSNH processing 178

LIST option

- DISPLAY BUFFERPOOL command 102

LLIB option of DSNH command 187

LnLIB option of DSNH command 187

LOAD option of DSNH command 187

LOAD utility

- effects of TERM command 300

LOCAL option of START irlmproc command 261

LOCATION

- option of DISPLAY THREAD command 145

- option of DISPLAY TRACE command 157

- option of RESET INDOUBT command 238

- option of START TRACE command 275

- option of STOP TRACE command 297

location name

- BIND PACKAGE subcommand 66, 76

- DISPLAY LOCATION command 134

- REBIND PACKAGE subcommand 66, 76

LOCKS option of DISPLAY DATABASE command 110

LOCKTABL option of START irlmproc command 260

LOG option

- TRACE command 302

logical page list (LPL) 252

- See also* LPL (logical page list)

LONGLOG option of ALTER UTILITY option 38

LOPTION option of DSNH command 187

LPL

- option of DISPLAY DATABASE command 113

LPL (logical page list)

- recovering pages

- using START DATABASE command 252

LSTATS option of DISPLAY BUFFERPOOL

- command 102

LUNAME

- DISPLAY LOCATION command 135

- option of RESET INDOUBT command 238

LUWID option

- DISPLAY THREAD command 145

- RECOVER INDOUBT command 233

- RESET INDOUBT command 239

## M

MACRO option of DSNH command 187

MAINT option of START DB2 command 256

MAXCSA option of START irlmproc command 260

MAXRO option of ALTER UTILITY command 38

MAXUSRS option of START irlmproc command

- description 261

MCS consoles

- scope of commands 23

MDETAIL option of DISPLAY GROUPBUFFERPOOL

- command 124

- member detail report of DISPLAY
  - GROUPBUFFERPOOL command 127
- MEMBER option
  - BIND PACKAGE subcommand 72
  - BIND PLAN subcommand 72
  - DISPLAY UTILITY command 160
- member, scope of command 23
- MERGECOPY utility
  - effects of TERM command 300
- message
  - DB2 commands 27
  - DCLGEN subcommand 90
  - DISPLAY THREAD with ACTIVE 144
  - DISPLAY TRACE command 158
  - DISPLAY UTILITY command 159, 160
  - DSN command of TSO 164
  - DSNH command 186
  - FLAG option of bind subcommands 68
  - FREE PACKAGE subcommand 205
  - FREE PLAN subcommand 207
  - MODIFY irlmproc,STATUS command 216
  - RUN subcommand 242
- message by identifier
  - DSN7106I 119
  - DSN9022I 27
  - DSN9023I 27
  - DSNB411I 103
  - DSNB412I 103
  - DSNB413I 103
  - DSNB414I 104
  - DSNB415I 104
  - DSNB420I 104
  - DSNB421I 104
  - DSNB430I 104
  - DSNB431I 105
  - DSNI021I 253
  - DSNJ315I 43
  - DSNJ316I 43
  - DSNJ317I 43
  - DSNJ318I 43
  - DSNL440I to DSNL449I 239
  - DSNL448I 238
  - DSNL450I 82
  - DSNT392I 113
  - DSNT500I 114
  - DSNT501I 114
  - DSNT736I 281
  - DSNU100I 160
  - DSNU105I 160
  - DSNU106I 160
  - DSNV413I 147
  - DSNW133I 270
  - DSNX943I 139
  - DSNX950I 139
- MODE option
  - ARCHIVE LOG command 41

- MODE option (*continued*)
  - STOP DB2 command 284
  - STOP DDF command 286
- MODIFY irlmproc,ABEND command of MVS
  - description 209
  - example 209
- MODIFY irlmproc,DIAG,DELAY
  - example 212
- MODIFY irlmproc,DIAG,DELAY command of MVS
  - description 211
- MODIFY irlmproc,SET command of MVS
  - description 213
  - example 214
  - option descriptions 213
- MODIFY irlmproc,STATUS command of MVS
  - description 215
  - example 217
  - option descriptions 215
- MODIFY TRACE command
  - description 221
  - example 223
- MODIFY utility
  - effects of TERM command 300
- MONITOR option
  - DISPLAY TRACE command 156
  - MODIFY TRACE command 222
  - START TRACE command 270
- monitor trace
  - class descriptions 274
  - displaying 154
  - starting 268
  - stopping 294
- MSTR option of START DB2 command 256
- MVS
  - commands
    - MODIFY irlmproc,ABEND 209, 210
    - MODIFY irlmproc,DIAG,DELAY 211
    - MODIFY irlmproc,SET 213
    - MODIFY irlmproc,STATUS 215
    - START irlmproc 259
    - STOP irlmproc 288, 289
    - TRACE CT 304

## N

- NAMES
  - option of DCLGEN subcommand 89
- naming convention
  - variables in command syntax 14
- network ID (NID) 233
  - See also* NID (network ID)
- NID (network ID)
  - option of RECOVER INDOUBT command 233
- NO LIMIT option of SET ARCHIVE command 244
- NO option of START irlmproc command 262

- NODEFER option
  - BIND PACKAGE subcommand 61
  - BIND PLAN subcommand 61
  - REBIND PACKAGE subcommand 61
  - REBIND PLAN subcommand 61
- NODISCON option of START irlmproc command 261
- NODUMP option of MODIFY irlmproc,ABEND command 209
- NOFOR option of DSNH command 188
- NOWRAP option of TRACE CT command 305

## O

- OASN option
  - CHANGE command 85
  - DISPLAY command 95
- online books 5
- OP option
  - START TRACE command 270
  - STOP TRACE command 296
- operands
  - DB2 command 22
- OPTIONS option
  - BIND PACKAGE subcommand 74
- OPTIONS option of DSNH command 188
- OUTNAME option of DSNH command 188
- OWNER
  - option of BIND PACKAGE subcommand 75
  - option of BIND PLAN subcommand 75
  - option of DCLGEN subcommand 88
  - option of REBIND PACKAGE subcommand 75
  - option of REBIND PLAN subcommand 75

## P

- P irlmproc command 288
  - See also* STOP irlmproc command of MVS package
- package
  - binding 46
  - identifier
    - BIND PACKAGE subcommand 76
    - REBIND PACKAGE subcommand 76
  - option of DSNH command 198
  - rebinding 224
  - replacing version of 58
- PACTION option of DSNH command 196
- parallel processing
  - DEGREE option of bind subcommands 62
  - VPPSEQT option of ALTER BUFFERPOOL command 30
- parameter
  - passing to application program 241
- PARM option of START DB2 command 255
- PARMS option
  - DSNH command 188
  - RUN subcommand 241

- parsing rules
  - commands 21
- PART option
  - DISPLAY DATABASE command 110
  - START DATABASE command 250
  - STOP DATABASE command 280
- partial-location name
  - DISPLAY LOCATION command 135
- PASS option of DSNH command 188
- PBIND option of DSNH command 196
- PC option of START irlmproc command 261
- PCICS option of DSNH command 196
- PCLOAD option of DSNH command 188
- PDBRMLIB option of DSNH command 197
- PDEFER option of DSNH command 197
- PDEGREE option of DSNH command 197
- PDISABLE option of DSNH command 197
- PDLIBATCH option of DSNH command 197
- PDMEM option of DSNH command 197
- PDYNAMICRULES option of DSNH command 197
- PENABLE option of DSNH command 198
- PERFM option
  - DISPLAY TRACE command 156
  - MODIFY TRACE command 222
  - START TRACE command 269
  - STOP TRACE command 296
- performance
  - trace
    - displaying 154
    - starting 268
    - stopping 294
- PFLAG option of DSNH command 198
- phases of execution
  - DSNH processing 178
- PIMSBMP option of DSNH command 198
- PIMSMP option of DSNH command 198
- PISOLATION option of DSNH command 198
- PKEEPDYNAMIC option of DSNH command 198
- PKLIST option
  - BIND PLAN subcommand 73
  - REBIND PLAN subcommand 73
- PL/I application program
  - macro processing step for DSNH 178
- PLAN
  - option of DSNH command 188
- PLAN
  - BIND PLAN subcommand 77
  - option of DISPLAY TRACE command 156
  - option of DSNH DISPLAY command 169
  - option of RUN subcommand 241
  - option of START TRACE command 271
  - option of STOP TRACE command 296
  - REBIND PLAN subcommand 77
- plan-name naming convention 16
- PLI option
  - DCLGEN subcommand 89



- PLI2LIB option of DSNH command 188
- PLIB option of DSNH command 188
- PLILIB option of DSNH command 189
- PLILOAD option of DSNH command 188
- PnLIB option of DSNH command 188
- PNODEFER option of DSNH command 198
- POPTION option of DSNH command 189
- POWNER option of DSNH command 198
- PQUALIFIER
  - option of DSNH command 198
- PRECOMP option of DSNH command 189
- precompier
  - DSNH command options 188
- precompiler
  - invoking DSNH 178
  - producing members for 72
- PRELEASE option of DSNH command 198
- PRELINK option of DSNH command 189
- PREOPT option of DSNH command 199
- PRINT
  - option of DSNH command 189
- privilege set of a process 17
- process
  - privilege set of 17
- processing
  - parallel
    - VPPSEQT option of ALTER BUFFERPOOL command 30
- PROGRAM option of RUN subcommand 240
- PSECSPAC option of DSNH command 190
- PSPACE option of DSNH command 190
- PVALIDATE option of DSNH command 199

## Q

- QUALIFIER
  - option of BIND PACKAGE subcommand 77
  - option of BIND PLAN subcommand 77
  - option of DSNH command 196
  - option of REBIND PACKAGE subcommand 77
  - option of REBIND PLAN subcommand 77
- qualifier-name naming convention 16
- QUIESCE option
  - DSNC STOP command 175
  - STOP DB2 command 284
  - STOP DDF command 286
- QUIESCE utility
  - effects of TERM command 300
- QUOTE
  - option of DCLGEN subcommand 90
- QUOTE option
  - of DSNH command 186

## R

- RATIO option of ALTER GROUPBUFFERPOOL command 35
- RCTERM option of DSNH command 190
- REBIND PACKAGE subcommand of DSN 224
  - description 224
  - example 226
  - option descriptions 56
- REBIND PLAN subcommand of DSN 227
  - description 227
  - example 230
  - option descriptions 56
- rebinding
  - initiating 224, 227
  - options for 56
- recognition character 21
- RECOVER BSDS command
  - description 231
  - example 231
- RECOVER INDEX utility
  - TERM command effects 300
- RECOVER INDOUBT command
  - description 232
  - example 234
  - option descriptions 232
- RECOVER TABLESPACE utility
  - TERM command effects 301
- recovery
  - BSDS 231
  - indoubt threads 232, 234
- RELEASE
  - option of BIND PACKAGE subcommand 78
  - option of BIND PLAN subcommand
    - description 78
  - option of DSNH command 196
  - option of REBIND PACKAGE subcommand 78
  - option of REBIND PLAN subcommand 78
- REMOTE
  - option of DSNH command 199
- REOPT
  - option of DSNH command 196
- REOPT option
  - BIND PACKAGE subcommand 74
  - BIND PLAN subcommand 74
  - REBIND PACKAGE subcommand 74
  - REBIND PLAN subcommand 74
- REORG utility
  - effects of TERM command 301
- REPAIR utility
  - effects of TERM command 301
- REPLACE
  - option of DCLGEN subcommand 89
  - option of DSNH command 193, 196
- replacing
  - version of a package 58

- REPLVER option
  - BIND PACKAGE subcommand 57
  - DSNH command 199
  - effect of 58
- REPORT utility
  - effects of TERM command 301
- reports
  - detail report 103
  - group detail report 126
  - member detail report 127
  - summary report
    - DISPLAY BUFFERPOOL command 102
    - DISPLAY GROUPBUFFERPOOL command 125, 130
- RES option of STOP TRACE command 296
- RESET
  - option of CHANGE command 85
- RESET GENERICLU command
  - description 235
  - example 236
  - option descriptions 235
- RESET INDOUBT command
  - description 237
  - option descriptions 238
- restarting
  - CICS attachment facility 175
  - connections between IMS and a subsystem 248
  - status of DB2 resources 255
  - utilities
    - terminated job steps 300
- RESTRICT
  - option of DISPLAY DATABASE command 111
- RETAIN option
  - BIND PLAN subcommand 57
  - DSNH command 196
- retained lock 110
  - See also* lock, retained
- RETRY option of DSN command 164
- return code
  - CURRENTSERVER option of bind and rebind sub-commands 61
  - DSN command 165
  - RUN subcommand of DSN 165
- RO option of START DATABASE command 251
- RUN
  - option of DSNH command
    - parameters 190
  - subcommand of DSN
    - description 240
    - example 242
    - option descriptions 240
    - return codes 165
- RUNIN option of DSNH command 190
- running
  - DSNH processing 178

- RUNOUT option of DSNH command 190
- RUNSTATS utility
  - effects of TERM command 301
- RW option of START DATABASE command 251

## S

- scanning rules
  - commands 21
  - scope of commands 23
- SCOPE option
  - ARCHIVE LOG command 41
  - START irlmproc command 261
- secondary authorization ID 17
  - See also* authorization ID, secondary
- SET ARCHIVE command
  - description 243
  - example 244
  - option descriptions 243
- SMF option
  - DISPLAY TRACE command 156
  - START TRACE command 270
  - STOP TRACE command 296
- softcopy publications 5
- SOURCE option of DSNH command 191
- SPACENAM option
  - DISPLAY DATABASE command 109
  - START DATABASE command 250
  - STOP DATABASE command 280
- SPACEUN option of DSNH command 191
- special character 14
- SPUFI
  - description 246
- SQL
  - option of DSNH command 191
- SQLDELIM option of DSNH command 191
- SQLERROR
  - option of BIND PACKAGE subcommand 78
  - option of DSNH command 199
- SQLFLAG option
  - DSNH command 191
- SQLRULES 196
  - option of BIND PLAN subcommand 79
  - option of REBIND PLAN subcommand 79
- SRC (subsystem recognition character) 21
  - See also* command prefix
- SRV option
  - DISPLAY TRACE command 156
  - START TRACE command 270
  - STOP TRACE command 296
- SSR command of IMS
  - description 247
- START command of IMS 248
- START DATABASE command
  - description 249
  - example 254

START DATABASE command (*continued*)  
 option descriptions 250  
 recovering object in group buffer pool 252  
 recovering pages on logical page list 252

START DB2 command  
 description 255  
 example 257  
 option descriptions 255

START DDF command 258

START irlmproc command of MVS  
 description 259  
 example 262  
 option descriptions 259

START PROCEDURE command  
 description 263  
 example 265  
 option descriptions 264

START RLIMIT command  
 description 266  
 example 267

START TRACE command  
 description 268  
 example 277  
 option descriptions 269

STAT option  
 DISPLAY TRACE command 156  
 MODIFY TRACE command 222  
 START TRACE command 269  
 STOP TRACE command 296

statistics  
 trace  
 class descriptions 273  
 displaying 154  
 starting 268  
 stopping 294

STATISTICS option of DSNCL DISPLAY command 169

status  
 cross-system coupling facility (XCF) status of  
 members 119  
 shown by DISPLAY DATABASE 113

STDSQL option  
 DSNH command 192

STOP command of IMS 278

STOP DATABASE command  
 description 279  
 example 282  
 option descriptions 280

STOP DB2 command  
 description 284  
 example 285

STOP DDF command  
 description 286  
 example 287

STOP irlmproc command of MVS 288

STOP PROCEDURE command  
 description 290

STOP PROCEDURE command (*continued*)  
 example 291  
 option descriptions 290

STOP RLIMIT command 293

STOP TRACE command  
 description 294  
 example 298  
 option descriptions 296

STOR option of MODIFY irlmproc,STATUS command of  
 MVS 216

stored procedure  
 displaying status 138  
 starting 263  
 stopping 290

STOSPACE utility  
 effects of TERM command 301

string  
 delimiter  
 COBOL 90  
 SQL 90

string option naming convention 16

STRUCTURE option of DCLGEN subcommand 90

SUB option of TRACE CT command 305

SUBS option of TRACE command 302

SUBSYS option  
 CHANGE command 85  
 DISPLAY command 95  
 START command 248  
 STOP command 278

subsystem  
 name  
 naming convention 16  
 naming convention 16

SUFFIX option  
 DSNH command 192

summary report  
 DISPLAY BUFFERPOOL command 102  
 DISPLAY GROUPBUFFERPOOL command 125

summary report example of DISPLAY  
 GROUPBUFFERPOOL command 130

syntax diagrams, how to read 1

SYSTEM option  
 DSN command 163  
 DSNH command 192

## T

TABLE  
 option of DCLGEN subcommand 88

table name  
 naming convention 16

table space  
 naming convention 17

TDATA option of START TRACE command 275

TERM option  
 DSNH command 192

- TERM UTILITY command
  - description 299
  - example 301
- terminating
  - connections between IMS and a subsystem 278
  - databases 279
  - DB2
    - description 284
  - IRLM 288
  - stored procedures 290
  - trace activity 294
  - utilities
    - description 299
- TEST option
  - DSN command 164
- thread
  - canceling 81
  - displaying
    - DISPLAY THREAD command 142
- TIME option
  - ARCHIVE LOG command 42
  - DSNH command 192
  - SET ARCHIVE command 244
- TNO option
  - DISPLAY TRACE command 157
  - MODIFY TRACE command 222
- trace
  - changing active traces 221
  - displaying 154
  - events 302
  - IFCIDs activated by trace class 272
  - starting 268
  - stopping 294
- TRACE
  - command of IMS
    - description 302
    - example 303
  - option of START TRACE command 275
- TRACE CT command of MVS
  - description 304
  - example 306
  - option descriptions 304
- TRACE option
  - START irlmproc command 262
- TRACE option of MODIFY irlmproc,SET command of MVS 214
- TRACE option of MODIFY irlmproc,STATUS command of MVS 216
- TRACK option of DSNH 191
- TRANSACTION option
  - DSNC DISPLAY command 169
  - DSNC MODIFY command 173
- TSO
  - CLISTs
    - DSNH 178, 202

- TSO option of DSNH command 190
- TYPE
  - option of DISPLAY GROUPBUFFERPOOL command 124
  - option of DISPLAY THREAD command 144

## U

- unit of recovery
  - IMS 96
- unit of work
  - displaying an outstanding 95
  - IMS
    - resetting by CHANGE 85
  - indoubt
    - resetting by CHANGE 85
- USE option of DISPLAY DATABASE command 110
- UT option of START DATABASE command 251
- utilities
  - displaying status 159
  - identifier 300
  - terminating 299
- utility-id naming convention 17

## V

- VALIDATE
  - option of BIND PACKAGE subcommand 80
  - option of BIND PLAN subcommand 80
  - option of DSNH command 196
  - option of REBIND PACKAGE subcommand 80
  - option of REBIND PLAN subcommand 80
- VDWQT option of ALTER BUFFERPOOL command 31
- VERSION
  - option of DSNH command 192
- version of a package
  - BIND PACKAGE subcommand 76
  - REBIND PACKAGE subcommand 76
- version-id naming convention 17
- virtual buffer pool parallel sequential steal threshold (VPSEQT) 30
- virtual buffer pool sequential steal threshold (VPSEQT) 30
- VPPSEQT option of ALTER BUFFERPOOL command 30
- VPSEQT option of ALTER BUFFERPOOL command 30
- VPSIZE option of ALTER BUFFERPOOL command 29
- VPXPSEQT option of ALTER BUFFERPOOL command 30
- VSAM (virtual storage access method)
  - password
    - DCLGEN subcommand 89
- VTAM (Virtual Telecommunications Access Method)
  - commands
    - DISPLAY NET 83

## **W**

WAIT option

    ARCHIVE LOG command 42

WORKUNIT option of DSNH command 192

WRAP option of TRACE CT command 304

WSECPAC option of DSNH command 192

WSPACE option of DSNH command 192

WTRSTART option of TRACE CT command 304

WTRSTOP option of TRACE CT command 305

## **X**

XCF (cross-system coupling facility) component of MVS

    status of members 119

XLIB option of DSNH command 193

XREF option

    DSNH command 193

## **Y**

YES option of START irlmproc command 262

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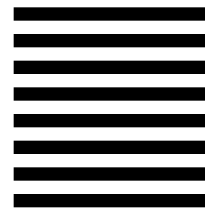
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