MAINVIEW® for DB2

User Guide

Volume 1: Overview/Analyzers/Monitors

Version 6.1

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bmcsoftware

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  - product version (release number)
  - license number and password (trial or permanent)
- operating-system and environment information
  - machine type
  - operating system type, version, and service pack or program temporary fix (PTF)
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or PTF
- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
  - product error messages
  - messages from the operating system, such as `file system full`
  - messages from related software

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About This Book

This book describes how to use the online functions of MAINVIEW for DB2. It can be used by the DB2 database administrator, system programmer, or performance analyst to control resource usage and performance. Before using this book, you must be familiar with the IBM DB2 program product.

The batch reporting functions are described in the *MAINVIEW for DB2 Performance Reporter User Guide*.

How This Book Is Organized

This book is organized into three volumes:

- Volume 1: Overview/Analyzers/Monitors
- Volume 2: Traces
- Volume 3: Views

These parts are included in Volume 1:

- An overview of how to use MAINVIEW for DB2. It includes
  - An introduction describing the major functions of MAINVIEW for DB2
  - A description of the Primary Option Menu and how to access the MVDB2 functions
- An overview of how to use the MAINVIEW for DB2 services that run in full-screen mode. It includes
  - The DB2 analyzer, monitor, and trace display services and their parameters organized alphabetically (in a tabular format with page references to the detailed service descriptions)
  - A description of the analyzers, monitors, and traces, and how they are used
  - The MVDB2 general commands and services
- The DB2 resource analyzer display services
- The DB2 resource and workload monitor data collection services

These parts are included in Volume 2:

- How to use the trace facility
- The DB2 application trace display services

These parts are included in Volume 3:

- Using Views and Wizards
- Managing Views
- Analyzing DB2 Performance

Appendixes, a glossary, and an index are included in all volumes.

Throughout the body of this document, MVDB2 refers to MAINVIEW for DB2. The DMR acronym for the product is used occasionally in this book and in many online panels and messages.

Conventions Used in This Book

The following syntax notation is used in this manual. Do not type the special characters.

- Brackets [ ] enclose optional parameters or keywords.
- Braces { } enclose a list of parameters; one must be chosen.
- A vertical line | separates alternative options; one can be chosen.
- An <u>underlined</u> parameter is the default.
- AN ITEM IN CAPITAL LETTERS indicates exact characters; usage can be all uppercase or lowercase.
- Items in lowercase letters are values you supply.

Recommended Reading

The following books are referenced in this edition:

- *DB2 Administration Guide* from IBM
- *DB2 Command and Utility Reference* from IBM
- *DB2 Diagnosis Guide and Reference* from IBM
- *CICS/ESA Problem Determination Guide* from IBM
- *MVS/ESA Application Development Macro Reference* from IBM
- *MAINVIEW Solutions Guide*
- *Using MAINVIEW*
- *Quick Start with MAINVIEW*
- *Product Installation and Maintenance Guide*
- *MAINVIEW Implementation Guide*
- *MAINVIEW Alternate Access Implementation and User Guide*
- *Implementing Security for MAINVIEW Products*
- *MAINVIEW Administration Guide*
- *MAINVIEW for DB2 New Release Information*
- *Getting Started with MAINVIEW for DB2 and RxD2*
- *MAINVIEW for DB2 User Guide Volume 1: Overview/Analyzers/Monitors*
- *MAINVIEW for DB2 User Guide Volume 2: Traces*
- *MAINVIEW for DB2 User Guide Volume 3: Views*
- *MAINVIEW for DB2 Performance Reporter User Guide*
- *RxD2 User Guide*
- *MAINVIEW for DB2 Customization Guide*

Related Reading

This book is included as part of the MAINVIEW library, which documents all your MAINVIEW products and the tasks associated with using these products.

MAINVIEW Library

The MAINVIEW library documents these products:

- AutoOPERATOR™ (AO)
- CMF® MONITOR Online (CMF)
- IMSPlex System Manager™ (IPSM)
- MAINVIEW® Desktop
- MAINVIEW® FOCAL POINT™
- MAINVIEW® for CICS (MVCICS)
- MAINVIEW® for DB2 (MVDB2)
- MAINVIEW® for DBCTL (MVDBC)
- MAINVIEW® for IMS (MVIMS)
- MAINVIEW® for MQSeries (MVMQS)
- MAINVIEW® for MVS (MVMVS)
- MAINVIEW® VistaPoint™(MVVP)
- Plex Manager (PLEXMGR)

The MAINVIEW library is organized into these three categories:

- Installer documentation
- Administrator documentation
- User documentation

Each book within these categories contains information about specific types of tasks. The following figure shows how this book relates with the other books in the MAINVIEW library.

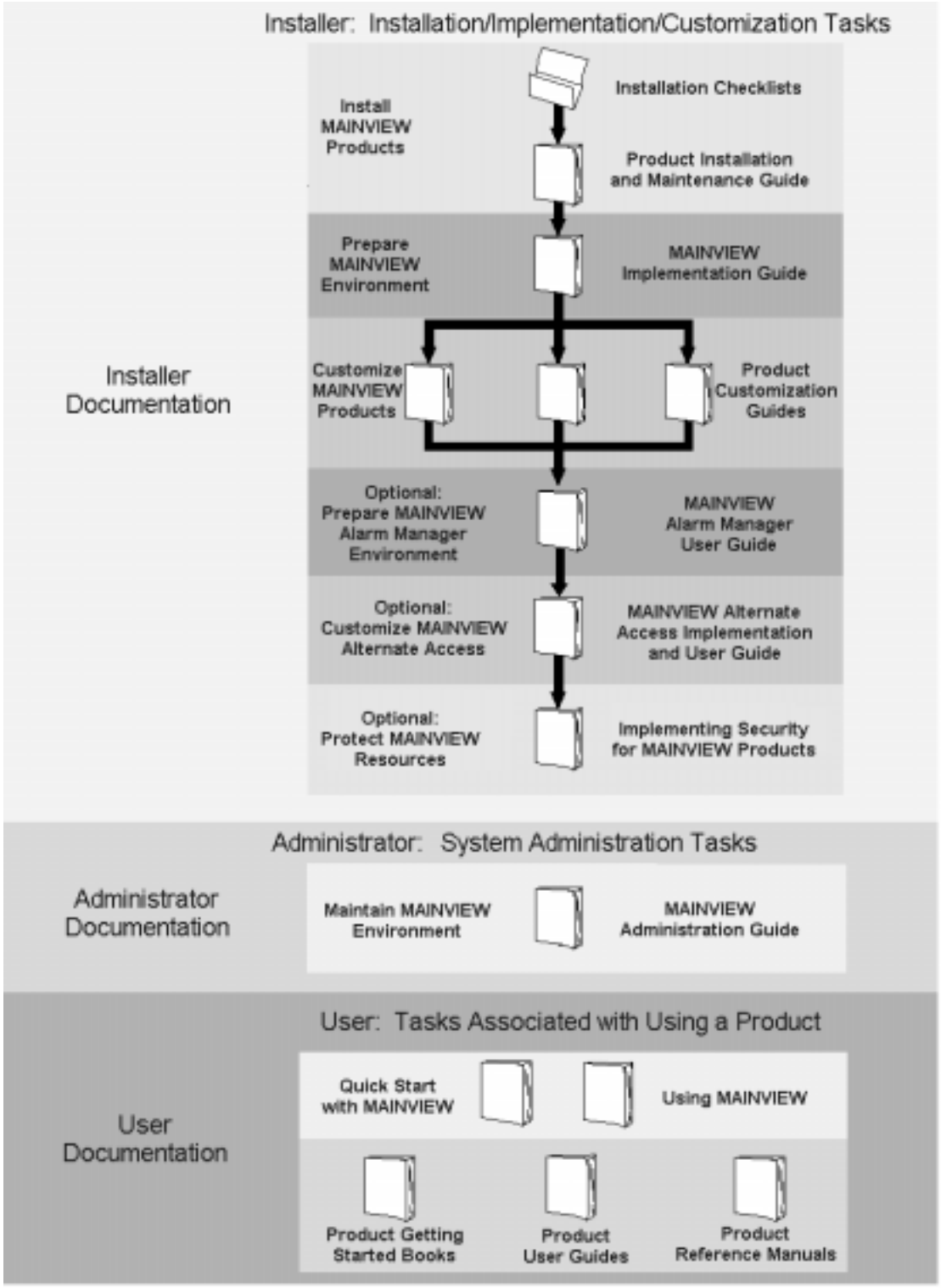

Figure 1. Organization of MAINVIEW Documentation

These books in the MAINVIEW library are used with all MAINVIEW products:

- *Quick Start with MAINVIEW* gives a brief overview to help you quickly get started using all your MAINVIEW products.
- *Using MAINVIEW* gives a more detailed description of how to use your MAINVIEW products. If you have more than one MAINVIEW product, it will help you understand how all your MAINVIEW products work. It will also help you use your products together and take advantage of the integration of all MAINVIEW products.
- The *Product Installation and Maintenance Guide* gives instructions for basic installation of the product libraries.
- The *MAINVIEW Implementation Guide* and the *MAINVIEW Administration Guide* provide customization and administration instructions for all MAINVIEW products.
- The *MAINVIEW Alternate Access Implementation and User Guide* describes how to use the MAINVIEW Alternate Access component. This component provides EXCP and VTAM communication to BMC Software products through ISPF without requiring a TSO subsystem to be active.
- *Implementing Security for MAINVIEW Products* describes how to implement security for MAINVIEW for DB2 with the external security manager installed at your site.

MAINVIEW for DB2 Library

The following documentation gives specific information about the MAINVIEW for DB2 and RxD2 products:

- *MAINVIEW for DB2 Release Notes* summarize the new features in this release of MAINVIEW for DB2 and RxD2. This enables you to quickly see what is new.
- The *MAINVIEW for DB2 Master Index* includes index entries for all the product-specific books in the MAINVIEW for DB2 library. This index shows where you can find information for specific topics in individual MAINVIEW for DB2 and RxD2 manuals.
- *Getting Started with MAINVIEW for DB2 and RxD2* is an introduction for new users of these products. It helps you use these products to solve problems more effectively in a short time.
- The *MAINVIEW for DB2 User Guide* (Volumes 1, 2, and 3) describes how to use the online monitor, analyzer, trace, and view services for the DB2 database administrator, system programmer, or performance analyst.
- The *MAINVIEW for DB2 Performance Reporter User Guide* describes how to create statistical batch reports about application activity and DB2 performance and resource usage for the database administrator, system programmer, or performance analyst.
- The *RxD2 User Guide* describes the RxD2 product, which provides access to DB2 from REXX. It also provides tools to query the DB2 catalog, issue dynamic SQL, test DB2 applications, analyze EXPLAIN data, generate DDL or DB2 utility JCL, edit DB2 table spaces, perform security administration, and much more. MAINVIEW for DB2 contains numerous hyperlinks to RxD2.
- The *MAINVIEW for DB2 Customization Guide* provides product-specific tailoring instructions. Use this book in conjunction with the *Product Installation and Maintenance Guide* and the *MAINVIEW Implementation Guide* during the customization process.
- Online tutorials are available by selecting option T from the MAINVIEW for DB2 Primary Option Menu or by pressing HELP (PF1/13) from the product application panels.

Part 1. Using MAINVIEW for DB2

This part gives an overview of how you can use MAINVIEW for DB2 to manage your DB2 systems.

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Chapter 1. Introduction

MAINVIEW for DB2 provides powerful realtime application performance analysis and monitoring for effective DB2 subsystem management. It comprises an easy-to-use, comprehensive set of services for database administrators, applications developers, and system programmers to track DB2 activity and status. Users can easily access any number of DB2 subsystems on multiple MVS systems in local and remote locations from a single terminal session, which can run under TSO, TSO/ISPF, VTAM or batch with an EXCP-supported terminal. It provides

- Online performance analysis and exception monitoring
- DB2 application tuning and workload analysis
- Historical reporting
- DB2 operations control
- MAINVIEW product integration

DB2 Online Performance Analysis

DB2 online performance analysis includes

- Current status and activity
- Exception monitoring
- DB2 Tuning Wizards
- Complete system management
- DB2 catalog and table access

Current Status and Activity

MAINVIEW for DB2 provides displays of DB2 status, current user status—both summary and detail (from CICS, IMS, TSO, and Batch), locking, EDM and buffer pools, table spaces, I/O activity, logging, and DSNZPARM data necessary to analyze system performance and bottlenecks. This information is always available at very low overhead cost even when DB2 processing suspends.

These displays are easily accessible through both windows mode and full-screen mode applications. Hyperlinks and an EXPAND function allow the user to move quickly from summary to detail information. Windows mode technology provides context-sensitive help with extensive DB2 tuning information. In addition, screen customization, graphics, and multiple windows provide the flexibility for each user to present the data exactly as needed to solve any monitoring or analysis task.

Exception Monitoring

Key values can be set up for continuous background monitoring and exception reporting based on user-defined thresholds. The history of the monitored values, such as buffer pool utilization or number of transactions processed per workload, is available online in historical plots. Special exceptions can be defined to detect applications using excessive resources (runaway queries), with different user-defined exception criteria for TSO, IMS, CICS, or batch jobs. The available options are described in the *MAINVIEW for DB2 Customization Guide*. Global exception displays show current status and a history of exception messages is available in the chronological Journal log.

DB2 Tuning Wizards

DB2 Tuning Wizards are designed to help you cope with today's complex systems and time pressures, turning data overload into usable knowledge about your DB2 systems. Wizards take advantage of the power of windows mode without requiring that you be an expert in all its usage techniques.

Each wizard is a set of views that leads you through all of the related information about a specific area of DB2 performance, providing critical DB2 tuning help and recommendations at just the point where they are needed. It presents the critical data in context with quick access to further details if needed.

Dynamic decision panels provide a consistent approach. Questions show the diagnostic paths, identifying ***what*** each path shows and ***why*** they could be important. Key indicators on the decision panels show whether a path is worth following, based on relevant current and long-term measurements.

Complete System Management

MAINVIEW for DB2 reports on key information from MVS, IMS, and CICS to assist in understanding the total DB2 environment. It is also part of a family of integrated products for performance monitoring and automated operations of DB2, IMS, CICS, MQSeries, and MVS.

DB2 Catalog and Table Access

MAINVIEW for DB2 is also integrated with RxD2/FlexTools, a comprehensive set of flexible DB2 tools that provides complete DB2 catalog management, security administration, extensive EXPLAIN and SQL test facilities, and DB2 object maintenance. These functions can be invoked directly from MAINVIEW for DB2. RxD2/LINK, the base architecture of the product, provides a standard interface to DB2 from IBM's SAA REXX language.

DB2 Application and Workload Analysis

MAINVIEW for DB2 provides both application and workload analysis.

Application Trace

The major concern in most DB2 installations is how to understand and control application and ad-hoc query SQL performance. MAINVIEW for DB2 addresses these concerns with a flexible application trace facility that can be used both by DBAs and application developers. The application trace facility provides all the data necessary to detect and solve SQL problems and review applications before production migration. Trace requests are managed automatically through DB2's Instrumentation Facility Interface (IFI).

Each trace request can be tailored to collect only the data required, from low-overhead summary traces (DB2 accounting records) through detail traces of SQL statements plus scans, I/Os, DDF events, and locks.

The traced data is viewed in integrated displays so that it is easy to see which scans, sorts, or I/Os are caused by which SQL statements without manual correlation. Summary displays provide high-level quick answers such as which SQL statement is consuming the most elapsed or CPU time. A chronological event trace shows a replay of the exact sequence of traced events. Details can be hidden to improve understanding of event flow or revealed when needed for detailed analysis.

Trace requests can be focused to narrow trace data collection by selecting specific workloads by such criteria as plan or authorization ID. Additional exception filters, such as *elapsed time greater than 10 seconds*, also can be defined so that only trace data that needs to be analyzed is retained.

Workload Analysis

Workload analysis can be automated with low-overhead workload monitors and traces. Proactive monitoring reduces the effort required to stay on top of how DB2 is performing and collects the historical data you need online. Workload monitors set up by workload group can detect service-level exceptions. Summary traces with different exception filters for CICS, IMS, TSO, and batch can save key data needed for later analysis of problem transactions or queries.

In windows mode, you can define workload groups and track service-level objectives based on thread elapsed or in-DB2 elapsed time. Default workloads are defined for transaction and query workloads based on DB2 attach type. You can further refine these workloads into application groups using DB2 identifiers such as plan name or connection.

Historical Analysis

Historical data can be tracked with trace logs, online views, and offline batch reports from DB2 tables.

Trace Logs

The trace logging facility allows logging of both summary and detail trace data to external VSAM data sets. All trace log data sets are tracked in an online trace directory. These data sets can be viewed online or printed in batch for offline review.

Online Views

A historical perspective on the data in online windows mode views is shown in two ways. First, when data is collected for a query to present a view, the data often covers both current interval and session data since DB2 started. Second, windows mode supports historical logging of data each interval. Interval records are written to the online historical data sets to capture the status of the monitored targets each time an interval completes. This data can be retrieved in the same views generally used for current-time data. This includes complete DB2 statistics data, I/O and lockout information, and the data collected by monitors.

DB2 Tables

Complete batch reporting on the DB2 statistics and accounting records is supported by creating DB2 tables. Each table can be tailored to contain only the columns you need. The detail accounting records can be summarized before loading into DB2. MAINVIEW for DB2 provides predefined batch and QMF reports, and the full power of SQL, QMF, and GDDM is available for user-defined reporting. The accounting data tables can be summarized into daily, weekly, or monthly tables to support long-term reporting without excessive DASD usage. Both summarization and purge routines are provided. Detail tables and reports are provided for audit data.

Operations Control/DB2 Console

MAINVIEW for DB2 provides several unique features that aid in operations control of DB2:

- DB2 console. A chronological journal log (LOG DISPLAY) of DB2 messages and MVDB2 exceptions allows you to go back in time to analyze earlier problems. From this log, DB2 commands can be issued and the responses viewed. The *MAINVIEW for DB2 Customization Guide* describes how to activate the logging of DB2 messages and the authorization required for a user to issue DB2 commands.
- Multiple systems support not only provides immediate user access to multiple DB2 systems on the same CPU but also to any number of DB2s on multiple MVS systems in local and remote locations.

  The windows mode technology also enables Single System Image (SSI) views that can pull together and even summarize data from multiple DB2 subsystems.

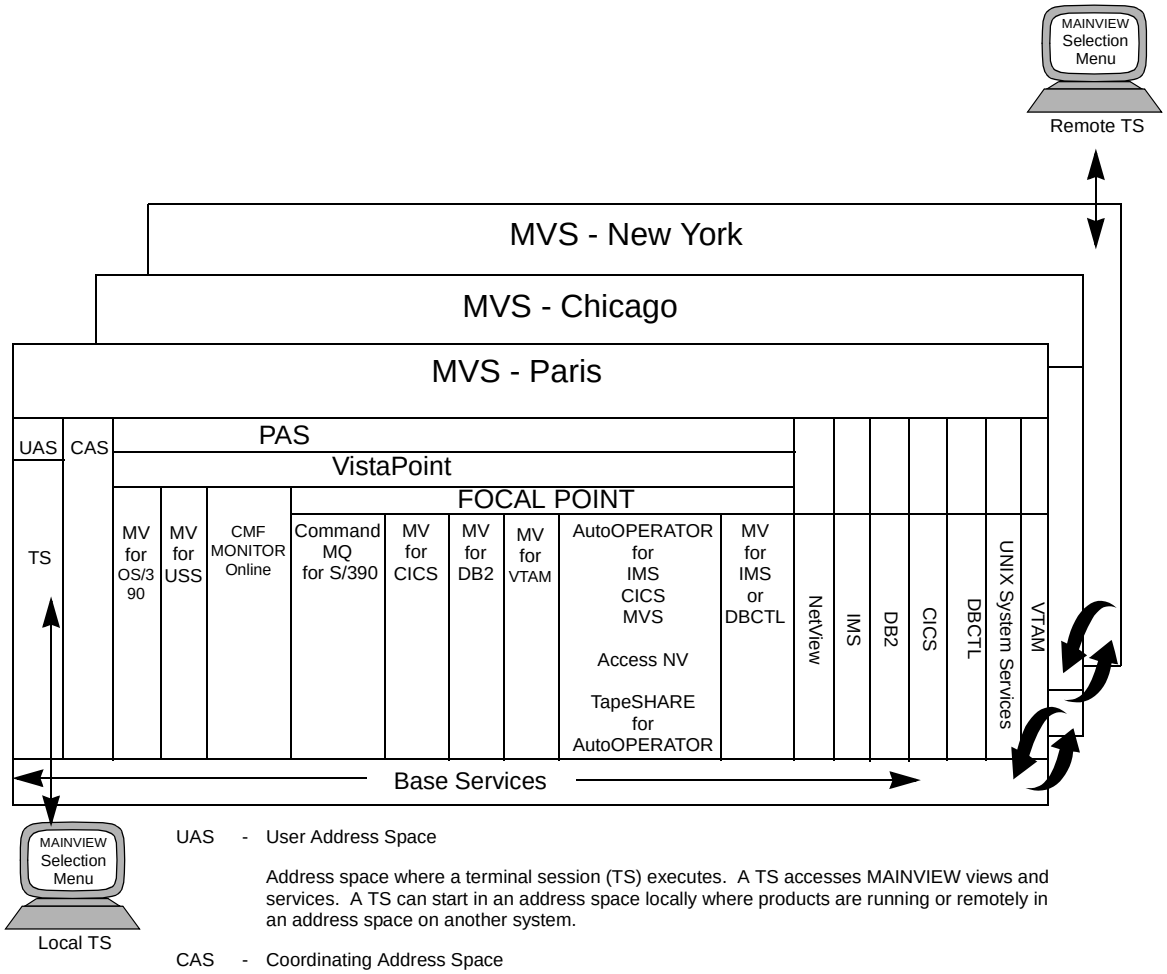
  This capability increases the span of control and saves time for all users managing more than one DB2. For example, a status overview display presents key indicators and exceptions for all DB2s, allowing for a quick check for potential problems. Any set of related DB2s, such as production or test, can be defined as a context for SSI monitoring.

  SSI views are even more important in a data sharing environment, since now a group of DB2 members that work together can finally be monitored as a whole. This not only simplifies sysplex management, but also increases understanding of this complex environment.
- Cycle screen refresh through full-screen status and exception displays from all these DB2 systems provides dynamic monitoring of multiple DB2s.
- Seamless integration with the BMC Software AutoOPERATOR products automates both DB2 operation and performance monitoring. Messages can initiate rules to take action, query the MVDB2 analyzer displays for additional information, or issue monitor commands. Exception messages can be sent to the MVS console to interface with other automated operator products.
- Total system status of all monitored values versus site thresholds can be seen at a glance in a graphic display with color support. Potential problems that have not yet resulted in exception conditions can thus be easily detected.
- User access through EXCP assures access even when TSO or VTAM does not respond.
- Security is provided per function and per DB2 system through user profiles and a user exit that controls access to thread activity displays.

MAINVIEW Product Integration

The MAINVIEW architecture integrates all the MAINVIEW performance products within a common communications framework that operates across multiple machines in multiple locations as shown in Figure 2 on page 9. This integrated architecture allows a single terminal session using one or more MAINVIEW products to monitor and manage multiple local or remote targets, whether MVS itself (sysplex and non-sysplex) or subsystems like CICS, IMS, MQSeries, and DB2.

MAINVIEW for DB2 runs in the same architecture as the other MAINVIEW products. You can access all installed products from the MAINVIEW Selection Menu in one terminal session and quickly transfer directly from one product to another. See *Using MAINVIEW* for further information.



UAS - User Address Space

Address space where a terminal session (TS) executes. A TS accesses MAINVIEW views and services. A TS can start in an address space locally where products are running or remotely in an address space on another system.

CAS - Coordinating Address Space

Manage communication with other local and remote CASs and enables direct communication between a TS and a PAS.

PAS - Product Address Space

Contains data collectors and runs MAINVIEW products as follows:

MVS PAS	CMF MONITOR MAINVIEW for OS/390 MAINVIEW for UNIX System Services VistaPoint for MVS workloads
BBI-SS PAS	AutoOPERATOR products Command MQ for S/390 MAINVIEW for: CICS DB2 DBCTL IMS VTAM VistaPoint for CICS, DB2, and IMS workloads
MVALARM PAS	MAINVIEW Alarm Manager

Base Services - BMC Software Base Technology

Figure 2. MAINVIEW Architecture

Chapter 2. MAINVIEW for DB2 Primary Option Menu

This chapter provides a brief overview of the MAINVIEW for DB2 Primary Option Menu shown in Figure 3.

```
BOOLE & BABBAGE ------------ PRIMARY OPTION MENU ------- MAINVIEW FOR DB2 6.1.0
OPTION  ===>                                                DATE   -- 00/05/22
                                                            TIME   -- 13:45:08
    Managing DB2 Performance:                               USERID -- CIR11
      1  STATUS         - DB2 Status (DB2ST)                MODE   -- ISPF 4.2
      2  ANALYZERS      - Current Status/Activity Displays
      3  MONITORS       - Early Warnings/Recent History (Active Timer Requests)
      4  TRACES         - Current Application Traces
      5  HISTORY TRACES - Historical Trace Data Sets
      6  GRAPH          - Recent Thread History
      7  I/O            - DB2 I/O Analysis
      8  BBI INFO       - BBI Subsystem Information
      V  VIEWS          - Windows Mode (New Facilities)

    DB2 administration:
      RX RxD2 FlexTools

    General Services:
      C  CYCLE SETUP  - Service Refresh Cycle Setup
      L  LOG DISPLAY  - Display Logs
      M  MESSAGES     - Display Messages and Codes
      K  KEYS         - Current PF Key Assignments
      T  TUTORIAL     - Tutorials/News/Getting Started       PF1/13: HELP
      X  EXIT         - Terminate                            PF3/15: EXIT
```

Figure 3. MAINVIEW for DB2 Primary Option Menu

Managing DB2 Performance

The menu options to manage DB2 performance are organized for ease of use. You can obtain immediate analyzer, monitor, or trace data about your DB2 system by selecting one of Options 1 through 8 or Option V.

Option/Application	Purpose
1 STATUS	Option 1 from the Primary Option Menu accesses the DB2ST display. DB2ST summarizes the activity and resource usage within your entire DB2 system so that you can determine quickly where there may be potential DB2 problems. You can quickly access other displays by selecting them from the EXPAND line or by tabbing to a particular section about which you want more information and pressing ENTER. You also can use this panel to make direct requests for other analyzer or monitor services when you already know the requests you want to make. “DB2ST—DB2 System Status” on page 129 describes this display in detail.

2 ANALYZERS	Option 2 from the Primary Option Menu accesses the Analyzer Display Services panel and provides access to detailed information about current DB2 status and activity. This application, described in Chapter 8, “List Analyzer Services (Option 2)” on page 119, is a scrollable list of all the analyzer display services.
3 MONITORS	Option 3 from the Primary Option Menu accesses a list of Active Timer Requests. This application displays current monitor measurements (timer-driven samplers of key DB2 performance indicators) and provides access to historical plots of data collected by each monitor. It also lets you control all timer-driven requests (monitors, Image log requests, or trace requests). This display, described in Chapter 18, “Active Timer Requests (Option 3)” on page 347, shows how many requests are already active and provides direct access with a select line command to a plot of data collected by an active monitor. Other line commands can be used to view current timer request options, access data entry panels to modify the current options or replicate them for another timer request, confirm a purge of a selected request, or stop a request. You can also use the SM command from this display to access the Data Collection Monitors panel, which lists all the data collection monitor services that you are authorized to view. You can then use the S line command to select the Start Monitor Request panel for any of the listed monitors.
4 TRACES	Option 4 from the Primary Option Menu displays only the current application trace requests. See “Controlling Current Traces (Option 4)” in Volume 2. This display shows how many current application traces are active or complete and provides direct access with a select line command to the collected trace data. Other line commands can be used to view current trace request options, access data entry panels to modify the current options or replicate them for another similar trace request, confirm a purge of a selected trace, or stop a trace. You can also use the ST command from this display to access the Start DB2 Trace Request panel to activate data collection for a summary or detail trace.
5 TRACE HISTORY	This application enables you to access and control the current and historical trace logs. See “Using the History Traces Application (Option 5)” in Volume 2 for a complete description.

6 GRAPH

Option 6 from the Primary Option Menu provides direct access to a graphical presentation of the Trace Summary by Time (TSUMT) display. It shows recent thread history summarized by hour, sorted in descending sequence.

- The values are plotted as percentages of the maximum value measured.
- The maximum is shown in the column header.
- Values over 90% of the maximum are red (or highlighted).
- Values over 70% of the maximum are yellow.
- Values less than 70% are green.
- Values less than 10% but non-zero show < in the first graph position.

All the other trace displays are available from here. For example, cursor selection of one line accesses the LTRAC display which shows all the single threads executed in that time period.

Note: The default trace identifier requested is THRDHIST, a continuous summary trace defined in the sample block BLKDMRW in the BBPARM data set. This block is predefined in AutoCustomization for auto-start. However, you can change the default definitions of this trace in BLKDMRW if desired.

See “TSUMx — Trace Summary Displays” and “TSUMT — Trace Summary by Time (INTERVAL START)” in Volume 2 for a complete description of the TSUMT service.

7 I/O

Option 7 from the Primary Option Menu accesses the I/O Analysis Options panel. This provides direct access to displays of available I/O information as well as options to start I/O traces. See “I/O Analysis Options” on page 15 for further information.

8 BBI INFO

This application shows the BBI-SS PAS status, timer facility activity statistics, and timer request default parameters in effect and summarizes the status of all the timer requests. See “Display Timer Facility Statistics (Option 8)” on page 106 for a complete description.

V VIEWS

This option presents another menu of options that display data from all your DB2 subsystems in views that use the MAINVIEW windows mode technology. These views display extensive DB2 data covering the analysis of DB2 subsystems, buffer pools and group buffer pools, page set status and I/O, lock contention lockout events, current thread activity, monitor data, and workload objectives. See Volume 3 for a complete description of these views.

General Services

The General Services options are described in detail in Chapter 6, “General Commands and Services” on page 73.

Option/Application	Purpose
C CYCLE SETUP	Displays refreshable applications in a continuous timed cycle.
L LOG DISPLAY	Displays DB2 messages (optional), responses to DB2 commands, other service messages and monitor warnings, and all TS commands.
M MESSAGES	Displays descriptions of messages generated by MAINVIEW for DB2.
K KEYS	Displays supported terminals and the functions assigned to the PF keys by MAINVIEW for DB2.
T TUTORIAL	Displays online help.
X EXIT	Terminates the BBI terminal session.

I/O Analysis Options

This application provides direct access to displays of available I/O information as well as control of I/O traces.

```
BOOLE AND BABBAGE----------  I/O ANALYSIS OPTIONS   ------------  RX AVAILABLE
COMMAND ==>                                                      TGT==> DB2D

Display Buffer Pool I/O Data:

  1  I/O BY DB/TS   - Display Realtime Data by Database / Tablespace
  2  I/O BY BPOOL   - Display Realtime Data by Buffer Pool
  3  I/O BY VOLUME  - Display Realtime Data by Volume
  4  I/O BY DATASET - Display Realtime Data by Data Set

Display I/O Data from a Trace:

  5  CURRENT TRACES - List Current I/O Traces: n Active, nn Complete
  6  HISTORY TRACES - List All History I/O Traces

Start a DMR I/O trace:

  7  START TRACE    - Review Primed Options / Activate (Start Trace Panels)

Print SMF/GTF I/O Traces

  8  DB2 TRACE      - Print Instructions
```

The following options are available:

Option	Purpose
1 I/O BY DB/TS	Option 1 displays I/O data kept in the buffer pools by DB2, summarized by database and table space. See “DBIOx—I/O (Realtime)” on page 291 for further information.
2 I/O BY BPOOL	Option 2 displays I/O data kept in the buffer pools by DB2, summarized by buffer pool. See “DBIOx—I/O (Realtime)” on page 291 for further information.
3 I/O BY VOLUME	Option 3 displays I/O data kept in the buffer pools by DB2, summarized by volume. See “DBIOx—I/O (Realtime)” on page 291 for further information.
4 I/O BY DATASET	Option 4 displays I/O data kept in the buffer pools by DB2, expanded to the data set level. See “DBIOx—I/O (Realtime)” on page 291 for further information.

5 CURRENT TRACES

Option 5 displays a list of current traces that include I/O events in the Current Traces application. The number of active and complete I/O traces available in Current Traces is shown here. Selecting one of these traces with the O line command accesses the DBIO display of I/O data by database / table space. From here, this data can be summarized and selected by several identifiers, such as plan name.

See “Controlling Current Traces (Option 4)” in Volume 2 for a description of the Current Traces application.

See “DBIOx — I/O Analysis (Trace)” in Volume 2 for further information on these displays and how to use them.

6 HISTORY TRACES

Option 6 displays a list of all history traces that include I/O events in the History Traces application. Selecting one of these traces with the O line command accesses the DBIO display of I/O data by database / table space. From here, this data can be summarized and selected by several identifiers, such as plan name.

See “Managing History Traces” in Volume 2 for a description of the History Traces application.

See “DBIOx — I/O Analysis (Trace)” in Volume 2 for further information on these displays and how to use them.

7 START TRACE

Option 7 primes the required keywords to start an I/O trace in MAINVIEW for DB2 and transfers to the Start Trace application. You can modify or add options before activating the trace. For example, you may want to narrow the selection criteria, make the title more descriptive, add SQL events, or set up logging. You must be authorized to start a detail trace with I/O events.

See “Starting a Trace” in Volume 2 for information on the other available options. The primed options are

- A default parameter of IOhhmmss as a traceid
- A default title of *I/O Trace*
- TYPE=D for a detail trace
- Selection of the detail trace I/O events
- Selection of all threads with DB2AUTH=+ (special authorization required)

Note: If you are tracing a large number of concurrent threads on an active system, increase the TRBUFF number to 2–3 times the default number.

8 DB2 TRACE

Option 8 provides instructions on running a DB2 system I/O trace (performance class 4) to be written to SMF or GTF and printing the output.

First ensure that the selected output medium can handle the potential volume of data to be traced. The DB2 command syntax to start such a trace is

```
-START TRACE(PERFM) CLASS(4) DEST(SMF) or DEST(GTF)
```

Stop the trace when enough data has been collected.

The batch trace print utility DZTBTRAC can be used to print this trace data, formatting the same DBIOx displays available for an MVDB2 trace. A sample print job is in member DZTBTRAC in BBSAMP.

See “Printing a Trace” in Volume 2 for information on the utility and “DBIOx — I/O Analysis (Trace)” in Volume 2 for a description of the available displays that can also be printed as reports.

Part 2. Working in Full-Screen Mode

This part gives an overview of how to use the MAINVIEW for DB2 services that run in full-screen mode: analyzers, monitors, and traces.

Specific information about how to use each of these types of services is described in their respective parts in Volume 1 and Volume 2 of the *MAINVIEW for DB2 User Guide.*

For information about working in full-screen mode that applies to multiple MAINVIEW products, see the *Using MAINVIEW* book.

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Chapter 3. Measuring DB2 Activities and Resources

The MVDB2 analyzer, monitor, and trace services measure the following DB2 activities and resources:

- General DB2 system
- User activity
- Locks
- EDM pool
- Buffer pools
- Logs
- MVS system interaction
- Distributed Data Facility (DDF)
- DB2 workload

These services are grouped in Table 1 by DB2 activity or resource area, with references to sections where each service is described in detail.

Table 1. DB2 Activities and Resources Measured

DB2 Activity/ Resource Area	**Analyzer and Trace Displays**	**Data Collection Services**
General DB2 System (AREA = DSYS)	“DB2ST—DB2 System Status” on page 129 “DB2EX—DB2 Exceptions” on page 141 “DBTS—Database and Table Space Status” on page 143 “ZPARM—DB2 System Parameters” on page 151	“DSOPN—Database Data Sets Open” on page 373 “DSOPR—Database Data Set Open Requests” on page 373 “DSUTL—Open Database Data Set Utilization” on page 374

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
User Activity (AREA = USER)	"USERS—User Summary" on page 153 "DUSER—User Detail Status" on page 160 "CICSC—CICS DB2 Connections" on page 212 "CICSR—CICS DB2 RCT Summary" on page 215 "CICSE—CICS DB2 RCT Entry Detail" on page 229 "CICST—CICS DB2 RCT Transactions" on page 244	"CONUT—Connection Percent Utilization" on page 375 "THDUT—Thread Percent Utilization" on page 375 "THDAC—Active Thread Status" on page 376 "THDQD—Queued Thread Status" on page 376 "DBTQD—Database Thread Queued" on page 377 "THDID—In Doubt Thread Status" on page 377 "THDCR—Create Thread Requests" on page 377 "THDWT—Create Thread Waited" on page 378 "THDAB—Rollback Requests" on page 378 "COMP2—Phase 2 Commits" on page 378 "COMSY—Sync Commits" on page 379 "COMRO—Read-Only Commits" on page 379 "EOMFL—End of Memory Failures" on page 379 "EOTFL—End of Task Failures" on page 380 "BINDS—Successful Automatic Binds" on page 380 "BINDF—Failed Automatic Binds" on page 380 "PLBND—Number of Plans Bound" on page 381

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
User Activity (continued)		"PKBND—Number of Packages Bound" on page 381 "BNPKS—Successful Automatic Binds for Packages" on page 381 "BNPKF—Failed Automatic Binds for Packages" on page 382 "SQLAC—SQL Activity" on page 382 "RSQLS—Remote SQL Statements Sent" on page 383 "RSQLR—Remote SQL Statements Received" on page 383 "PRLG—I/O Parallel Groups Executed" on page 384 "PRLF—I/O Parallel Groups with Fallback to Sequential" on page 384 "PRLSF—Sysplex Parallel Query Failures" on page 385 "SPROC—Stored Procedures" on page 385 "LOBMX—Maximum LOB Storage" on page 386 "DROWA—Direct Row Access" on page 386 "TRIGR—Trigger Usage" on page 387 "NESTM—Maximum Nested SQL Level" on page 387 "UDF—UDF Usage" on page 388 (See *SQL Activity by Workload* on page 33)

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Locks (AREA = LOCK)	"LOCKD—Lock Contention by DB/TS" on page 249 "LOCKU—Lock Contention by User (Summary)" on page 258 "LOCKE—Lock Contention by User (Detail)" on page 261 "CLAIM—Claims and Drains for Table Space Partitions" on page 268 "LKOUT—Lockout History" on page 275	"USLOK—Users Suspended for Locks" on page 389 "TSLOK—Table Space Locks" on page 390 "IXLOK—Index Space Locks" on page 390 "PGLOK—Page Locks" on page 391 "MXLOK—Maximum Page Lock Held by User" on page 391 "LDEAD—Lock Deadlock Failures" on page 391 "LTIME—Lock Timeout Failures" on page 392 "LESCL—Lock Escalations" on page 392 "LSUSP—Suspensions" on page 393 "LREQ—Lock Requests" on page 393 "ILREQ—IRLM Request Counts" on page 394 "CLM—Claim Requests" on page 394 "CLMF—Claim Failures" on page 394 "DRN—Drain Requests" on page 395 "DRNF—Drain Failures" on page 395 "GPLK—Global P-Lock Requests" on page 395 "GXES—Global Lock XES Requests" on page 396

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Locks (continued)		"GSUSP—Global Lock Suspensions" on page 397 "GNEG—Negotiate P-Lock" on page 397 "GNOEN—No Engines—P-Lock" on page 398 "GNTFM—Notify Messages" on page 398 (See *Lock Usage by Workload* on page 35)
EDM Pool (AREA = EDM)	"EDMPL—DB2 Environmental Descriptor Manager (EDM) Pool Status" on page 277	"EDMUT—EDM Pool % Utilization" on page 399 "EDMLD—Average EDM Requests per Load I/O" on page 399 "EDMDS—EDM Data Space Percent Utilization" on page 400

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Buffer Pools (AREA = BUFR)	"BFRPL—DB2 Buffer Pool Status" on page 290 "DBIOx—I/O (Realtime)" on page 291 "RIDPL—RID Pool Status" on page 292	"BPUTL—Buffer Pool Percent Utilization" on page 401 "BPUSE—Buffer Pool Percent in Use" on page 402 "RWP—Reads with Paging" on page 402 "WWP—Writes with Paging" on page 403 "GETPG—GETPAGE Requests" on page 403 "RIO—Read I/O Activity" on page 404 "SWS—System Page Updates" on page 404 "WIO—Write I/O Activity" on page 405 "PWS—System Pages Written" on page 405 "GETRI—GETPAGE (GET) Requests per Read I/O (RIO)" on page 406 "SWSPW—System Page Updates (SWS) per System Pages Written (PWS)" on page 406 "PWSWI—System Pages Written (PWS) per Write I/O (WIO)" on page 407 "MIGDS—Migrated Data Sets" on page 407 "RTO—Recall Time-Outs" on page 408 "PIO—Prefetch Read I/O" on page 408 "RIDUT—RID Pool Percent Utilization" on page 409 "MIAPF—Multi-Index Failures" on page 409

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Buffer Pools (continued)		"LSTPF—Number of List Prefetch Requests" on page 409 "DESRD—Number of Pages for Which Destructive Read Requested" on page 410 "DWTX—Vertical Deferred Write Threshold Reached" on page 410 "PFTRQ—Total Prefetch Requests" on page 411 "PFTIO—Total Prefetch Read I/O" on page 411 "PFTPG—Total Prefetch Pages Read" on page 412 "PFSRQ—Sequential Prefetch Requests" on page 412 "PFSIO—Sequential Prefetch Read I/O" on page 413 "PFSPG—Sequential Prefetch Pages Read" on page 413 "PFLRQ—List Prefetch Requests" on page 414 "PFLIO—List Prefetch Read I/O" on page 414 "PFLPG—List Prefetch Pages Read" on page 415 "PFDRQ—Dynamic Prefetch Requests" on page 415 "PFDIO—Dynamic Prefetch Read I/O" on page 416 "PFDPG—Dynamic Prefetch Pages Read" on page 416 "PFIOF—Prefetch I/O Failures" on page 417 "PRLQ—Parallel Query Requests" on page 417

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Buffer Pools (continued)		"PRLQF—Parallel Query Request Failures" on page 418 "PRLGF—Conditional GETPAGE Failures" on page 418 "PRL12—Prefetch Reduced to 1/2" on page 419 "PRL14—Prefetch Reduced to 1/4" on page 419 "HPVPS—Successful Synchronous Reads for HP-to-VP" on page 420 "HPVPA—Successful Asynchronous Reads for HP-to-VP" on page 420 "MAXPF—Maximum Concurrent Parallel I/O Prefetch Streams" on page 421 "HPWRF—Write Page Failures" on page 421 "HPRDF—Read Pages Failures" on page 422 "SEQPG—Sequential GETPAGE Requests" on page 422 "SEQIO—Sequential Read I/O Requests" on page 423 "WKPFZ—Workfile Prefetch Quantity Is Zero" on page 423 "WKNBF—Workfile Not Created—No Buffers" on page 424 "WKMAX—Max Workfiles Used Concurrently" on page 424 "GRDRQ—GBP Read Requests with Data" on page 425 "GPGWR—GBP Pages Written" on page 425

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Buffer Pools (continued)		"GCAST—GBP Castout Requests" on page 426 "GCTPG—GBP Castout Pages" on page 426 "GRDIN—GBP Read Requests—Interest" on page 427 "GRDNO—GBP Read Requests—No Interest" on page 427 "GFAIL—GBP Failures" on page 428 "GOTHR—GBP Other Requests" on page 428 "G2WRF—GBP Coupling Facility Write Fail Secondary" on page 429 (See *Buffer Usage by Workload* on page 34)

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Logs (AREA = LOG)	"DLOGS—DB2 Log Status" on page 295	"ARCWA—Archive Log Write Allocations" on page 431 "ARCRA—Archive Log Read Allocations" on page 431 "ARCWR—Archive Log CIs Written" on page 432 "LOGWT—Log Buffer Waits" on page 432 "LOGWR—Log Write Requests" on page 432 "LOGUT—Active Log Percent Utilization" on page 433 "LOGRD—Log Reads for Backout/Recovery" on page 433 "BSDSA—BSDS Access Requests" on page 434 "CHKPT—Number of Checkpoints" on page 434 "CKPFR—Checkpoint Frequency" on page 434 "ARCDL—Read Accesses Delayed" on page 435 "ARCTM—Look-Ahead Tape Mounts" on page 435
MVS Interaction (AREA = DMVS)		"DB2DP—Demand Paging" on page 437 "CSAPG—CSA Paging" on page 438 "CSAP—CSA Percentage of Utilization" on page 438 "ECSAP—Extended CSA Percentage of Utilization" on page 438 (See *CPU Usage by Workload* on page 34)

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Distributed Data Facility (AREA = DDF)	"DDFSM—DDF Statistics Summary" on page 306 "DDFDT—DDF Statistics Detail" on page 310 "DDFVT—DDF VTAM Status" on page 314 "DDFCV—DDF Conversations" on page 317	"DDFBS—DDF Bytes Sent" on page 439 "DDFBR—DDF Bytes Received" on page 439 "DDFCQ—DDF Conversations Queued" on page 440 "CNVLM—Conversations Deallocated—ZPARM Limit" on page 440 "NACTC—Current Inactive DB Threads" on page 441 "P2CON—2-Phase Connections" on page 441 "P2RSY—2-Phase Resync Connections" on page 442 "P2RMT—Remote Location Coordinator Total Operations" on page 442 "P2RMI—Remote Location Coordinator INDOUBTS" on page 443 "P2RMC—Remote Location Coordinator COMMITS" on page 443 "P2RMR—Remote Location Coordinator ROLLBACKs" on page 444 "DDFT1—Connections Terminated—Maximum Type 1" on page 444 "DBATQ—DBATs Queued—MAXDBAT Reached" on page 445

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
DB2 Application Trace (AREA = WKLD)	"LTRAC — DB2 Trace Entries" in Volume 2 "TSTAT — Trace Statistics" in Volume 2 "TSUMA — Trace Summary by Authorization ID (AUTHID)" in Volume 2 "TSUMC — Trace Summary by Connection Name (CONNECT)" in Volume 2 "TSUML — Trace Summary by Location Name (LOCATION)" in Volume 2 "TSUMP — Trace Summary by Plan Name (PLAN)" in Volume 2 "TSUMR — Trace Summary by Correlation ID (CORR-ID)" in Volume 2 "TSUMT — Trace Summary by Time (INTERVAL START)" in Volume 2 "DBIO — I/O Analysis by Database / Table Space (DB/TS)" in Volume 2 "DBIOA — I/O Analysis by Authorization ID (AUTHID)" in Volume 2 "DBIOF — I/O Analysis by Buffer Pool (BPOOL)" in Volume 2 "DBIOC — I/O Analysis by Connection Name (CONNECT)" in Volume 2 "DBIOL — I/O Analysis by Location (LOCATION)" in Volume 2 "DBIOP — I/O Analysis by Plan (PLAN)" in Volume 2 "DBIOK — I/O Analysis by Package / Program (PKG/PGM)" in Volume 2 "DBIOS — I/O Analysis by SQL Statement (SQL STMT)" in Volume 2 "DBIOT — I/O Analysis by Time (INTERVAL START)" in Volume 2	"ATRAC — DB2 Application Trace" in Volume 2

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
DB2 Application Trace (continued)	"STRAC — Summary Trace Entry" in Volume 2 "DTRAC — Detail Trace Entry" in Volume 2 "UTRAC — User Detail Trace" in Volume 2	
SQL Activity by Workload (AREA = WKLD)		"#SQLD—DDL Statements" on page 447 "#SQLM—Data Manipulative SQL Statements" on page 447 "#SQLA—Administrative SQL Statements" on page 448 "#SQLC—SQL Statements per Commit" on page 448 "#DYN—Dynamic SQL Statements" on page 449 "#CALL—SQL Call Statements" on page 449 "#SPRC—Stored Procedures Executed" on page 449 "#REOP—Reoptimizations" on page 450

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Buffer Usage by Workload (AREA = WKLD)		"#GETP—GETPAGE Requests" on page 451 "#UPDP—Update Page Requests" on page 451 "#RDIO—Read I/Os" on page 452 "#PFRD—Prefetch Reads" on page 452 "#WRIT—Write Immediates" on page 452 "#PFRQ—Prefetch Requests" on page 453 "#PFIO—Prefetch I/Os" on page 453 "#PFPG—Prefetch Pages Read" on page 453 "#GETF—Conditional GETPAGE Failures" on page 454 "#HPVS—Synchronous Hiperpool Reads" on page 454 "#HPPG—Asynchronous Hiperpool Pages Read" on page 454 "#GSRD—GBP Synchronous Reads" on page 455 "#GSWR—GBP Changed Pages Written" on page 455 "#GSWC—GBP Clean Pages Written" on page 455
CPU Usage by Workload (AREA = WKLD)		"@CPU—Average CPU Used" on page 457 "@CPUD—Average CPU in DB2" on page 457

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Lock Usage by Workload (AREA = WKLD)		"#DDLK—Deadlocks" on page 459 "#TMO—Timeouts" on page 459 "#SUSP—Suspensions" on page 460 "#ESCL—Escalations" on page 460 "#MAXL—Maximum Locks Held" on page 460 "#CLMF—Claim Failures" on page 461 "#DRNF—Drain Failures" on page 461 "#GSUS—Global Contention Suspensions" on page 461 "#GFAL—False Contention Suspensions" on page 462 "#GRTA—Incompatible Retained Lock Suspensions" on page 462 "#GLRQ—Global P-Lock Lock Requests" on page 462 "#GLKX—Global Lock XES Requests" on page 463 "#GNTS—Notify Messages Sent" on page 463

Table 1. DB2 Activities and Resources Measured (Continued)

DB2 Activity/ Resource Area	Analyzer and Trace Displays	Data Collection Services
Elapsed Time by Workload (AREA = WKLD)		"@ELAP—Average Elapsed Time" on page 465 "@ELPD—Average Elapsed in DB2" on page 465 "@ELP3—Average Elapsed Wait—All Class 3" on page 466 "@ELIO—Average Elapsed for I/O" on page 466 "@ELLK—Average Elapsed for Locks" on page 466 "@ELPR—Average Elapsed Time for Prefetch Reads" on page 467 "@ELDR—Average Elapsed for Drain Waits" on page 467 "@ELCL—Average Elapsed for Claim Waits" on page 468 "@ELPL—Average Elapsed for Page Latch" on page 468 "@ELSP—Average Elapsed Wait—SPROC TCB" on page 468 "@ELGM—Average Elapsed Wait—Notify Message" on page 469 "@ELGL—Average Elapsed Wait—Global Lock" on page 469
Transaction Workload (AREA = WKLD)		"#PROC—Transactions Processed" on page 471
Parallelism by Workload (AREA = WKLD)		"#PRLG—Parallel I/O Groups Executed" on page 473 "#PRLR—Parallel I/O Groups Executed Reduced Degree" on page 473 "#PRLF—Parallel I/O Groups Fallback to Sequential" on page 474 "#PRLS—Sysplex Parallel Query Failures" on page 474

Chapter 4. Alphabetical Reference of Services

This chapter provides an alphabetical reference for all the MAINVIEW for DB2 services that run in full-screen mode. The services are divided into five categories:

- Analyzer services
- Application Trace display services
- Application Trace monitors
- Resource monitors
- Workload monitors

Analyzer Services

Table 2 is an alphabetical list of all the DB2 analyzer services and their parameters with page references to a more detailed description about their use. Also see “Analyzers” on page 60. The display services are activated as described in Chapter 8, “List Analyzer Services (Option 2)” on page 119.

Table 2. DB2 Analyzer Services

Service Select Code	Parameter	Use
BFRPL	[DELTA|RATE] [buffer pool id] [SORT|SO=cc]	“BFRPL—DB2 Buffer Pool Status” on page 290
CICSC		“CICSC—CICS DB2 Connections” on page 212
CICSE	[CICS connection id,txid]	“CICSE—CICS DB2 RCT Entry Detail” on page 229
CICSR	[CICS connection id,SORT=]	“CICSR—CICS DB2 RCT Summary” on page 215
CICST	{CICS connection id,db2entry name}	“CICST—CICS DB2 RCT Transactions” on page 244
CLAIM	{DBTS=(dbname,tsname)}	“CLAIM—Claims and Drains for Table Space Partitions” on page 268
DBIOB	{TOTAL|SYNC|ASYNC} [,SORT|SO=cc] [,BP=BPnn] [,VOL=volser]	“DBIOx—I/O (Realtime)” on page 291 (by BPOOL)

Table 2. DB2 Analyzer Services (Continued)

Service Select Code	Parameter	Use
DBIOD	{TOTAL|SYNC|ASYNC} [,SORT|SO=cc] [,BP=BPnn] [,VOL=volser] [,DBTS=(dbname,tsname)]	“DBIOx—I/O (Realtime)” on page 291 (by DATASET)
DBIOR	{TOTAL|SYNC|ASYNC} [,SORT|SO=cc] [,BP=BPnn] [,VOL=volser]	“DBIOx—I/O (Realtime)” on page 291 (by DB/TS)
DBIOV	{TOTAL|SYNC|ASYNC} [,SORT|SO=cc] [,BP=BPnn] [,VOL=volser]	“DBIOx—I/O (Realtime)” on page 291 (by VOLUME)
DBTS	[S database| S database,table space| F database| F database,table space| ,QUAL|Q=cond|,VOL|V=+| ,SORT|SO=cc]	“DBTS—Database and Table Space Status” on page 143
DB2EX	[I|W|S|M]	“DB2EX—DB2 Exceptions” on page 141
DB2ST	[DELTA|RATE]	“DB2ST—DB2 System Status” on page 129
DDFCV	[luname]	“DDFCV—DDF Conversations” on page 317
DDFDT	{location name} [,DELTA|,RATE]	“DDFDT—DDF Statistics Detail” on page 310
DDFSM	[DELTA|RATE]	“DDFSM—DDF Statistics Summary” on page 306
DDFVT	[DELTA|RATE]	“DDFVT—DDF VTAM Status” on page 314
DLOGS	[DELTA|RATE]	“DLOGS—DB2 Log Status” on page 295
DUSER	{user id| authorization id| correlation id} [connection name] [,CANCEL]	“DUSER—User Detail Status” on page 160

Table 2. DB2 Analyzer Services (Continued)

Service Select Code	Parameter	Use
EDMPL	[DELTA|RATE] [FREE] [DBD]	“EDMPL—DB2 Environmental Descriptor Manager (EDM) Pool Status” on page 277
LKOUT	[SORT|SO=cc]	“LKOUT—Lockout History” on page 275
LOCKD	[S database| S database,table space| F database| F database,table space| ,H|,W|,PLAN|,CORRID]	“LOCKD—Lock Contention by DB/TS” on page 249
LOCKE	{user id| authorization id| correlation id}	“LOCKE—Lock Contention by User (Detail)” on page 261
LOCKU		“LOCKU—Lock Contention by User (Summary)” on page 258
RIDPL	[DELTA|RATE]	“RIDPL—RID Pool Status” on page 292
USERS	[TSO|BATCH|CAF|UTIL| IMS|CICS|DBAT|DDF] [,DBTS=(dbname,tsname)] [,SORT]	“USERS—User Summary” on page 153
ZPARM		“ZPARM—DB2 System Parameters” on page 151

Application Trace Display Services

Table 3 is an alphabetical list of all the application trace display services and their parameters with page references to a more detailed description about their use. Also see “Analyzers” on page 60. The display services are activated as described in Chapter 8, “List Analyzer Services (Option 2)” on page 119.

Table 3. DB2 Application Trace Display Service Select Codes

Service Select Code	Parameter	Use
DBIO	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIO — I/O Analysis by Database / Table Space (DB/TS)” in Volume 2
DBIOA	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOA — I/O Analysis by Authorization ID (AUTHID)” in Volume 2
DBIOC	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOC — I/O Analysis by Connection Name (CONNECT)” in Volume 2
DBIOF	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOF — I/O Analysis by Buffer Pool (BPOOL)” in Volume 2
DBIOK	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOK — I/O Analysis by Package / Program (PKG/PGM)” in Volume 2

Table 3. DB2 Application Trace Display Service Select Codes (Continued)

Service Select Code	Parameter	Use
DBIOL	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOL — I/O Analysis by Location (LOCATION)” in Volume 2
DBIOP	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOP — I/O Analysis by Plan (PLAN)” in Volume 2
DBIOS	{trace id} {,TOTAL|SYNC|ASYNC} [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOS — I/O Analysis by SQL Statement (SQL STMT)” in Volume 2
DBIOT	{trace id} {,TOTAL|SYNC|ASYNC} [,INTVL=nnM|nnH] [,SORT=xx] [,DBTS=(dbname,tsname)] [,A|AUTHID=xxxxxxxx] [,BP=BPnn] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“DBIOT — I/O Analysis by Time (INTERVAL START)” in Volume 2
DTRAC	[trace id] [,SEQ=sequence number] [,LEVEL=1|2|3] [,PGM=xxxxxxxx]	“DTRAC — Detail Trace Entry” in Volume 2
LTRAC	[trace id] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]] [,L|LOC=xxxxxxxx]	“LTRAC — DB2 Trace Entries” in Volume 2
STRAC	[trace id] [,SEQ=sequence number] [,SQL|SCAN|IOLOCK|SORTS|ELAPSED| BPOOL|ENV|SQLCOUNTS|LOCKS|PRLL| PKG|SPAS|DDF] [,SORT=cc]	“STRAC — Summary Trace Entry” in Volume 2

Table 3. DB2 Application Trace Display Service Select Codes (Continued)

Service Select Code	Parameter	Use
TSTAT	[trace id] [,DTL] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSTAT — Trace Statistics” in Volume 2
TSUMA	[trace id] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUMA — Trace Summary by Authorization ID (AUTHID)” in Volume 2
TSUMC	[trace id] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUMC — Trace Summary by Connection Name (CONNECT)” in Volume 2
TSUML	[trace id] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUML — Trace Summary by Location Name (LOCATION)” in Volume 2
TSUMP	[trace id] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUMP — Trace Summary by Plan Name (PLAN)” in Volume 2
TSUMR	[trace id] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUMR — Trace Summary by Correlation ID (CORR-ID)” in Volume 2

Table 3. DB2 Application Trace Display Service Select Codes (Continued)

Service Select Code	Parameter	Use
TSUMT	[trace id] [,INTVL=nnt] [,GRAPH=NO|AVG|TOT] [,SORT=xx] [,A|AUTHID=xxxxxxxx] [,C|CONNECT=xxxxxxxx] [,L|LOC=xxxxxxxx] [,P|PLAN=xxxxxxxx] [,R|CORRID=xxxxxxxxxxxx] [,T|TIME=hhmm[-hhmm]] [,D|DAY=nn[-nn]]	“TSUMT — Trace Summary by Time (INTERVAL START)” in Volume 2
UTRAC	{user id| authorization id| correlation id} [,SEQ=sequence number] [,LEVEL=1|2|3]	“UTRAC — User Detail Trace” in Volume 2

Monitor Services

This section alphabetically lists in Table 4 and in Table 5 all the DB2 monitor services and the application trace monitor services and the parameters unique to each service with page references to a more detailed description about their use. These are data collection services. "Resource or Workload Monitors" on page 60 describes how monitor data is collected and "Collecting Trace Data" in Volume 2 describes data collection for traces. The process of activating a data collection service request is described in Chapter 19, "Data Collection Monitors (SM Command)" on page 359, in "ATRAC — DB2 Application Trace" in Volume 2, and in "The SET Timer Request" on page 75.

Application Trace Monitors

Table 4. DB2 Application Trace Monitors

Service Select Code	Parameter	Use
ATRAC	[trace id]	"ATRAC — DB2 Application Trace" in Volume 2

Resource Monitors

Table 5. DB2 Resource Monitors

Service Select Code	Parameter	Use
ARCDL		"ARCDL—Read Accesses Delayed" on page 435
ARCRA		"ARCRA—Archive Log Read Allocations" on page 431
ARCTC		"CKPFR—Checkpoint Frequency" on page 434
ARCTM	[FAIL|SUCCESS]	"ARCTM—Look-Ahead Tape Mounts" on page 435
ARCWA		"ARCWA—Archive Log Write Allocations" on page 431
ARCWR		"ARCWR—Archive Log CIs Written" on page 432
BINDF		"BINDF—Failed Automatic Binds" on page 380

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
BINDS		"BINDS—Successful Automatic Binds" on page 380
BNPKF		"BNPKF—Failed Automatic Binds for Packages" on page 382
BNPKS		"BNPKS—Successful Automatic Binds for Packages" on page 381
BPUSE	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"BPUSE—Buffer Pool Percent in Use" on page 402
BPUTL	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"BPUTL—Buffer Pool Percent Utilization" on page 401
BSDSA		"BSDSA—BSDS Access Requests" on page 434
CHKPT		"CHKPT—Number of Checkpoints" on page 434
CKPFR		"CKPFR—Checkpoint Frequency" on page 434
CLM		"CLM—Claim Requests" on page 394
CLMF		"CLMF—Claim Failures" on page 394
CNVLM		"CNVLM—Conversations Deallocated—ZPARM Limit" on page 440
COMP2		"COMP2—Phase 2 Commits" on page 378
COMRO		"COMRO—Read-Only Commits" on page 379
COMSY		"COMSY—Sync Commits" on page 379
CONUT	[TSO|BATCH|DBAT]	"CONUT—Connection Percent Utilization" on page 375
CSAP		"CSAP—CSA Percentage of Utilization" on page 438

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
CSAPG		"CSAPG—CSA Paging" on page 438
DB2DP	[IRLM|SSAS|DBAS|SPAS|DB2|DDF]	"DB2DP—Demand Paging" on page 437
DBATQ	[NEW]	"DBATQ—DBATs Queued—MAXDBAT Reached" on page 445
DBTQD		"DBTQD—Database Thread Queued" on page 377
DDFBR	[location name]	"DDFBR—DDF Bytes Received" on page 439
DDFBS	[location name]	"DDFBS—DDF Bytes Sent" on page 439
DDFCQ	[lu name]	"DDFCQ—DDF Conversations Queued" on page 440
DDFT1		"DDFT1—Connections Terminated—Maximum Type 1" on page 444
DESRD	[buffer pool id]	"DESRD—Number of Pages for Which Destructive Read Requested" on page 410
DRN		"DRN—Drain Requests" on page 395
DRNF		"DRNF—Drain Failures" on page 395
DROWA	[USED|FAILIX|FAILTS|FAILURES]	"DROWA—Direct Row Access" on page 386
DSOPN		"DSOPN—Database Data Sets Open" on page 373
DSOPR	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"DSOPR—Database Data Set Open Requests" on page 373
DSUTL		"DSUTL—Open Database Data Set Utilization" on page 374

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
DWTX	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"DWTX—Vertical Deferred Write Threshold Reached" on page 410
ECSAP		"ECSAP—Extended CSA Percentage of Utilization" on page 438
EDMDS		"EDMDS—EDM Data Space Percent Utilization" on page 400
EDMLD	[CT|PT|DBD]	"EDMLD—Average EDM Requests per Load I/O" on page 399
EDMUT	[NOSK]	"EDMUT—EDM Pool % Utilization" on page 399
EOMFL		"EOMFL—End of Memory Failures" on page 379
EOTFL		"EOTFL—End of Task Failures" on page 380
G2WRF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"G2WRF—GBP Coupling Facility Write Fail Secondary" on page 429
GCAST	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"GCAST—GBP Castout Requests" on page 426
GCTPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"GCTPG—GBP Castout Pages" on page 426
GETPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"GETPG—GETPAGE Requests" on page 403
GETRI	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"GETRI—GETPAGE (GET) Requests per Read I/O (RIO)" on page 406
GFAIL	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"GFAIL—GBP Failures" on page 428
GNEG	[PGSET|PAGE|CHNG|OTHER]	"GNEG—Negotiate P-Lock" on page 397
GNOEN		"GNOEN—No Engines—P-Lock" on page 398
GNTFM	[SENT|RECV]	"GNTFM—Notify Messages" on page 398

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
GOTHR	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"GOTHR—GBP Other Requests" on page 428
GPGWR	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"GPGWR—GBP Pages Written" on page 425
GPLK	[LOCK|CHANGE|UNLOCK]	"GPLK—Global P-Lock Requests" on page 395
GRDIN	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"GRDIN—GBP Read Requests—Interest" on page 427
GRDNO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"GRDNO—GBP Read Requests—No Interest" on page 427
GRDRQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"GRDRQ—GBP Read Requests with Data" on page 425
GSUSP	[IRLM|XES|FALSE|INCOMPAT]	"GSUSP—Global Lock Suspensions" on page 397
GXES	[LOCK|CHANGE|UNLOCK|ASYNC]	"GXES—Global Lock XES Requests" on page 396
HPRDF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"HPRDF—Read Pages Failures" on page 422
HPVPA	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"HPVPA—Successful Asynchronous Reads for HP-to-VP" on page 420
HPVPS	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"HPVPS—Successful Synchronous Reads for HP-to-VP" on page 420
HPWRF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"HPWRF—Write Page Failures" on page 421
ILREQ	[QUERY|CHANGE|OTHER]	"ILREQ—IRLM Request Counts" on page 394
IXLOK	[SHR|EXCL]	"IXLOK—Index Space Locks" on page 390
LDEAD		"LDEAD—Lock Deadlock Failures" on page 391
LESCL	[SHR|EXCL]	"LESCL—Lock Escalations" on page 392

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
LOBMX		"LOBMX—Maximum LOB Storage" on page 386
LOGRD	[BUFFER|ACTIVE|ARCHIVE]	"LOGRD—Log Reads for Backout/Recovery" on page 433
LOGUT		"LOGUT—Active Log Percent Utilization" on page 433
LOGWR	[FORCE|NOWAIT]	"LOGWR—Log Write Requests" on page 432
LOGWT		"LOGWT—Log Buffer Waits" on page 432
LREQ	[LOCK|UNLOCK]	"LREQ—Lock Requests" on page 393
LSTPF	[buffer pool id]	"LSTPF—Number of List Prefetch Requests" on page 409
LSUSP	[LOCK|LATCH|OTHER]	"LSUSP—Suspensions" on page 393
LTIME		"LTIME—Lock Timeout Failures" on page 392
MAXPF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"MAXPF—Maximum Concurrent Parallel I/O Prefetch Streams" on page 421
MIAPF	[STOR|#RIDS]	"MIAPF—Multi-Index Failures" on page 409
MIGDS	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"MIGDS—Migrated Data Sets" on page 407
MXLOK		"MXLOK—Maximum Page Lock Held by User" on page 391
NACTC		"NACTC—Current Inactive DB Threads" on page 441
NESTM		"NESTM—Maximum Nested SQL Level" on page 387

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
PFDIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFDIO—Dynamic Prefetch Read I/O” on page 416
PFDPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFDPG—Dynamic Prefetch Pages Read” on page 416
PFDRQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFDRQ—Dynamic Prefetch Requests” on page 415
PFIOF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFIOF—Prefetch I/O Failures” on page 417
PFLIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFLIO—List Prefetch Read I/O” on page 414
PFLPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFLPG—List Prefetch Pages Read” on page 415
PFLRQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFLRQ—List Prefetch Requests” on page 414
PFSIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFSIO—Sequential Prefetch Read I/O” on page 413
PFSPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFSPG—Sequential Prefetch Pages Read” on page 413
PFSRQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFSRQ—Sequential Prefetch Requests” on page 412
PFTIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFTIO—Total Prefetch Read I/O” on page 411
PFTPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFTPG—Total Prefetch Pages Read” on page 412
PFTRQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PFTRQ—Total Prefetch Requests” on page 411
PGLOK	[SHR|EXCL]	“PGLOK—Page Locks” on page 391
PIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	“PIO—Prefetch Read I/O” on page 408
PKBND	[BIND|REBIND]	“PKBND—Number of Packages Bound” on page 381

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
PLBND	[BIND|REBIND]	"PLBND—Number of Plans Bound" on page 381
PRLF	[CURSOR|NOSORT|NOBFR|NOENCLAV]	"PRLF—I/O Parallel Groups with Fallback to Sequential" on page 384
PRLG	[PLANNED|REDUCED]	"PRLG—I/O Parallel Groups Executed" on page 384
PRLGF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PRLGF—Conditional GETPAGE Failures" on page 418
PRLQ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PRLQ—Parallel Query Requests" on page 417
PRLQF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PRLQF—Parallel Query Request Failures" on page 418
PRLSF	[COORNO|ISORR|CSKIP]	"PRLSF—Sysplex Parallel Query Failures" on page 385
PRL12	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PRL12—Prefetch Reduced to 1/2" on page 419
PRL14	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PRL14—Prefetch Reduced to 1/4" on page 419
PWS	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PWS—System Pages Written" on page 405
PWSWI	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9|BP32K–BP32K9]	"PWSWI—System Pages Written (PWS) per Write I/O (WIO)" on page 407
P2CON	[COLD|WARM]	"P2CON—2-Phase Connections" on page 441
P2RMC	[location name]	"P2RMC—Remote Location Coordinator COMMITS" on page 443
P2RMI	[location name]	"P2RMI—Remote Location Coordinator INDOUBTS" on page 443
P2RMR	[location name]	"P2RMR—Remote Location Coordinator ROLLBACKs" on page 444

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
P2RMT	[location name]	"P2RMT—Remote Location Coordinator Total Operations" on page 442
P2RSY	[FAIL|SUCCESS]	"P2RSY—2-Phase Resync Connections" on page 442
RIDUT		"RIDUT—RID Pool Percent Utilization" on page 409
RIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"RIO—Read I/O Activity" on page 404
RSQLR	[location name]	"RSQLR—Remote SQL Statements Received" on page 383
RSQLS	[location name]	"RSQLS—Remote SQL Statements Sent" on page 383
RTO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"RTO—Recall Time-Outs" on page 408 (HSM recall)
RWP	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"RWP—Reads with Paging" on page 402
SEQIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"SEQIO—Sequential Read I/O Requests" on page 423
SEQPG	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"SEQPG—Sequential GETPAGE Requests" on page 422
SPROC	[CALLS|ABENDS|TIMEOUTS| REJECTS]	"SPROC—Stored Procedures" on page 385
SQLAC	[DDL|AUTH|SEL|LOCK|UID| DYN|CTL|OPEN|CLOSE|CALL]	"SQLAC—SQL Activity" on page 382
SWS	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"SWS—System Page Updates" on page 404
SWSPW	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"SWSPW—System Page Updates (SWS) per System Pages Written (PWS)" on page 406
THDAB		"THDAB—Rollback Requests" on page 378
THDAC	[TSO|BATCH|CAF|UTIL|SPAS| IMS|CICS|DBAT|DIST|DDF|RRSAF]	"THDAC—Active Thread Status" on page 376

Table 5. DB2 Resource Monitors (Continued)

Service Select Code	Parameter	Use
THDCR		"THDCR—Create Thread Requests" on page 377
THDID		"THDID—In Doubt Thread Status" on page 377
THDQD	[TSO|BATCH|CAF|UTIL| IMS|CICS]	"THDQD—Queued Thread Status" on page 376
THDUT		"THDUT—Thread Percent Utilization" on page 375
THDWT		"THDWT—Create Thread Waited" on page 378
TRIGR	[STMT|ROW|ERROR]	"TRIGR—Trigger Usage" on page 387
TSLOK	[SHR|EXCL]	"TSLOK—Table Space Locks" on page 390
UDF	[EXECS|ABENDS|TIMEOUTS|REJECTS| FAILURES]	"UDF—UDF Usage" on page 388
USLOK	[TSO|BATCH|CAF|UTIL|DBAT| DIST|DDF|IMS|CICS|SPAS|RRSAF]	"USLOK—Users Suspended for Locks" on page 389
WIO	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"WIO—Write I/O Activity" on page 405
WWP	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"WWP—Writes with Paging" on page 403
WKMAX	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"WKMAX—Max Workfiles Used Concurrently" on page 424
WKNBF	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"WKNBF—Workfile Not Created—No Buffers" on page 424
WKPFZ	[BP0–BP49|BP8K–BP8K9|BP16K–BP16K9| BP32K–BP32K9]	"WKPFZ—Workfile Prefetch Quantity Is Zero" on page 423

Workload Monitors

Table 6. DB2 Workload Monitors

Service Select Code	Parameter	Use
#CALL	[id]	“#CALL—SQL Call Statements” on page 449
#CLMF	[id]	“#CLMF—Claim Failures” on page 461
#DDLK	[id]	“#DDLK—Deadlocks” on page 459
#DRNF	[id]	“#DRNF—Drain Failures” on page 461
#DYN	[id]	“#DYN—Dynamic SQL Statements” on page 449
#ESCL	[id]	“#ESCL—Escalations” on page 460
#GETF	[id]	“#GETF—Conditional GETPAGE Failures” on page 454
#GETP	[id]	“#GETP—GETPAGE Requests” on page 451
#GFAL	[id]	“#GFAL—False Contention Suspensions” on page 462
#GLKX	[id]	“#GLKX—Global Lock XES Requests” on page 463
#GLRQ	[id]	“#GLRQ—Global P-Lock Lock Requests” on page 462
#GNTS	[id]	“#GNTS—Notify Messages Sent” on page 463
#GRTA	[id]	“#GRTA—Incompatible Retained Lock Suspensions” on page 462
#GSRD	[id]	“#GSRD—GBP Synchronous Reads” on page 455
#GSUS	[id]	“#GSUS—Global Contention Suspensions” on page 461
#GSWC	[id]	“#GSWC—GBP Clean Pages Written” on page 455

Table 6. DB2 Workload Monitors (Continued)

Service Select Code	Parameter	Use
#GSWR	[id]	“#GSWR—GBP Changed Pages Written” on page 455
#HPPG	[id]	“#HPPG—Asynchronous Hiperpool Pages Read” on page 454
#HPVS	[id]	“#HPVS—Synchronous Hiperpool Reads” on page 454
#MAXL	[id]	“#MAXL—Maximum Locks Held” on page 460
#PFIO	[id]	“#PFIO—Prefetch I/Os” on page 453
#PFPG	[id]	“#PFPG—Prefetch Pages Read” on page 453
#PFRD	[id]	“#PFRD—Prefetch Reads” on page 452
#PFRQ	[id]	“#PFRQ—Prefetch Requests” on page 453
#PRLF	[id]	“#PRLF—Parallel I/O Groups Fallback to Sequential” on page 474
#PRLG	[id]	“#PRLG—Parallel I/O Groups Executed” on page 473
#PRLR	[id]	“#PRLR—Parallel I/O Groups Executed Reduced Degree” on page 473
#PRLS	[id]	“#PRLS—Sysplex Parallel Query Failures” on page 474
#PROC	[id]	“#PROC—Transactions Processed” on page 471
#RDIO	[id]	“#RDIO—Read I/Os” on page 452
#REOP	[id]	“#REOP—Reoptimizations” on page 450
#SPRC	[id]	“#SPRC—Stored Procedures Executed” on page 449
#SQLA	[id]	“#SQLA—Administrative SQL Statements” on page 448

Table 6. DB2 Workload Monitors (Continued)

Service Select Code	Parameter	Use
#SQLC	[id]	“#SQLC—SQL Statements per Commit” on page 448
#SQLD	[id]	“#SQLD—DDL Statements” on page 447
#SQLM	[id]	“#SQLM—Data Manipulative SQL Statements” on page 447
#SUSP	[id]	“#SUSP—Suspensions” on page 460
#TMO	[id]	“#TMO—Timeouts” on page 459
#UPDP	[id]	“#UPDP—Update Page Requests” on page 451
#WRIT	[id]	“#WRIT—Write Immediates” on page 452
@CPU	[id]	“@CPU—Average CPU Used” on page 457
@CPUD	[id]	“@CPUD—Average CPU in DB2” on page 457
@ELAP	[id]	“@ELAP—Average Elapsed Time” on page 465
@ELCL	[id]	“@ELCL—Average Elapsed for Claim Waits” on page 468
@ELDR	[id]	“@ELDR—Average Elapsed for Drain Waits” on page 467
@ELGL	[id]	“@ELGL—Average Elapsed Wait—Global Lock” on page 469
@ELGM	[id]	“@ELGM—Average Elapsed Wait—Notify Message” on page 469
@ELIO	[id]	“@ELIO—Average Elapsed for I/O” on page 466
@ELLK	[id]	“@ELLK—Average Elapsed for Locks” on page 466
@ELP3	[id]	“@ELP3—Average Elapsed Wait—All Class 3” on page 466
@ELPD	[id]	“@ELPD—Average Elapsed in DB2” on page 465

Table 6. DB2 Workload Monitors (Continued)

Service Select Code	Parameter	Use
`@ELPL`	`[id]`	"@ELPL—Average Elapsed for Page Latch" on page 468
`@ELPR`	`[id]`	"@ELPR—Average Elapsed Time for Prefetch Reads" on page 467
`@ELSP`	`[id]`	"@ELSP—Average Elapsed Wait—SPROC TCB" on page 468

Chapter 5. Overview of Services

The MAINVIEW for DB2 services that run in full-screen mode include

Analyzers Show formatted full-screen displays of DB2 status and activity

Monitors Measure and collect data about DB2 resource or workload performance over time and detect exception conditions

Traces Track transaction processing through DB2

Traces require both monitor data collection and analyzer displays. ATRAC is a monitor service that activates trace data collection. LTRAC, STRAC, and DTRAC are analyzer displays of data collected by ATRAC.

Requests

Services are activated as user requests as follows:

- Analyzers can be selected from an analyzer service list, from an EXPAND selection bar, or requested from a Service Display panel by overtyping the service name.
- Timer-driven monitors that measure DB2 resources and workloads or track transaction processing are SET service requests.

  They can be selected from a monitor service list and started from a data entry panel. The collected data can be viewed with special display services similar to analyzers.
- Timer-controlled requests that activate transaction tracing can be started from a data entry panel accessed from a list of current traces.
- Timer-controlled requests for automatic analyzer display logging can be started from a data entry panel accessed from an analyzer service list.

SET requests for timer-driven services are generated automatically from data entry panels and specified options are defined as keyword parameters. Optional service parameters narrow the scope of a single request and let several requests for the same service be active concurrently.

A standard set of timer-controlled monitor, trace, or logging requests can be started automatically with the BBI-SS PAS. Additional requests can be made at any time or requests can be modified or purged. Active monitors detect DB2 shutdown and startup. When the request is made, quiesce and restart options can be defined that specify the monitor action when DB2 stops or restarts. Monitors can be restarted automatically with previously collected data saved or deleted, or they can be purged or remain in a quiesced state when DB2 starts.

Analyzers

The DB2 analyzers are services that provide a formatted, full-screen display of current DB2 status and activity at a terminal in response to a request. The displays can also be automatically logged to the BBI-SS PAS Image log at time-driven intervals with SET service requests.

These displays show DB2 status, current user summary and detail status (from CICS, IMS, TSO, DBAT, and BATCH threads), locking, EDM and buffer pools, table spaces, logging, and DSNZPARM data for analyzing system performance and bottlenecks. An EXPAND function lets you move quickly from summary to detail information or from one display to other related displays. Screen prints can be written automatically by request.

Analyzer services that show lists of resources or workloads are scrollable.

Resource or Workload Monitors

These monitors are timer-driven services that collect data measurements about DB2 performance and detect exception conditions in response to a resource or workload monitor request.

A DB2 resource or workload monitor request specifies what is to be measured, the sampling frequency, the time of day to begin the sampling, the sampling duration, the disposition of data when the DB2 subsystem is not available, and the threshold that defines a warning condition for this monitor request.

Each timer-driven resource or workload monitor measures either resource or workload status, count of activity, or usage percentage or calculates a ratio of resource or workload usage over time. The measurement obtained at each sampling interval is compared to a user-defined threshold for that request. The threshold comparison detects conditions for which user-defined warning messages can be issued. These messages can be captured by AutoOPERATOR to take automatic actions. The collected measurements are stored online so that a plot of the recent history of a monitor request can be viewed at any time.

Data Collection

A request for a resource or workload monitor service specifies

- The monitor to be used (service select code and parameter)

  Note: This defines the DB2 resource or activity to be measured.

- When monitoring should begin
- How long monitoring should continue
- How often the activity is to be measured (sampling interval)
- A warning threshold
- Workload selection criteria (workload monitors only)
- Which service functions should be performed

The active service request automatically measures the corresponding system variable (see "Data Measurements" on page 62) at the time interval specified on the SET request. This data can be accessed online, automatically logged, or refreshed as described in the *Using MAINVIEW* manual.

The workload monitors and resource monitors use the same timer and SET facility to activate and control requests. For data collection, they use different facilities:

- Application trace and workload monitors use IBM's Instrumentation Facility Interface (IFI).
- Resource monitors collect data through their own timer-driven services.

Historical Data Storage

To make concise short- and long-term histories available for the graphic plot display, historical data is always stored as

- Ten detail measurements. These are the latest 10 values, each collected at the expiration of the user-defined interval. For example, if the standard sampling interval of 1 minute is in effect, the measurements of each of the last 10 minutes are available. When a new measurement is made, the oldest value is overwritten (in other words, the values wrap around every 10 intervals).
- Two summary periods, current and previous. Both values are updated at the expiration of 10 intervals (wrap point) when 10 new detail measurements have been collected. The current period value is moved to the previous period and the sum of the 10 detail measurements is moved to the current period. The current period value includes from 1 to 10 of the detail measurements available at any one time. The wrap point is indicated by an arrow in the display provided by the PLOT service.
- Total. This is the total accumulated in the time the request has been active. It is updated at each interval when a new measurement is made.

  Note: Both the summary periods and the total are shown as averages-per-interval in the graphic display so the plotted detail values can be compared.
- A frequency distribution. This distribution is updated at each interval if range limits are defined with the request. From two to five ranges are allowed. The new measurement value is compared to the defined limits to find the range in which it belongs and the number of occurrences for that range is incremented by one.
- The high-water mark. This is the maximum value ever measured at any interval and the time it occurred.

Following is an example of the storage of historical data:

If a request is started at 10:00 a.m. with an interval of one minute, the detail counters wrap around at 10:10, 10:20, and so on. The history available at 10:35 is:

- The detail measurements covering the last 10 minutes, from 10:25 to 10:35
- The current period from 10:20 to 10:30
- The previous period from 10:10 to 10:20
- The total from 10:00 to 10:35

Data Measurements

Four types of automatic service measurements can be taken periodically and shown by the PLOT display request. These are

COUNT An activity count over time; for example, the number of create thread requests within a specified time interval

Note: When COUNT data is plotted, in addition to the counts, rates-per-second are automatically calculated and shown for the displayed time intervals (AVG/SEC).

AVERAGE The quantity over time; for example, the average number of EDM page requests per load I/O in the specified interval

Note: When AVERAGE data is plotted, in addition to the averages, the event counts used to calculate the averages are also shown for the displayed time intervals (EVENTS). For example, for the plotted average EDM page requests per load I/O, both the number of EDM page requests and load I/O are shown.

STATUS The status level at the moment of measurement; for example, the number of active threads or table space locks

PERCENT Resource usage at the moment of measurement, expressed as a percentage of the maximum; for example, percent buffer pool utilization

See "Monitor History Display (PLOT)" on page 95 for a sample PLOT display and a complete description of the display contents.

Warning Conditions

SET request parameters for a monitor service can be used to define a value that is compared to the measurement taken during the requested sampling interval. The comparison establishes a warning condition when the measurement either exceeds a maximum-defined threshold or is less than a minimum-defined threshold. When the service detects this exception, it automatically sends a message to the BBI-SS PAS Journal and also to the system console upon user request. The message text is

- A unique message ID
- The time the exception was detected
- The title of the service, which can be changed by the user with a TITLE parameter in the service request
- The measured value
- The sampling interval (if applicable)
- The defined threshold

The service sends an exception-cleared message with the service title to the BBI-SS PAS Journal when the service no longer detects a condition greater than the defined threshold value. The monitor exception messages are also posted and cleared from the DB2EX analyzer exception display.

The monitor request can be used to

- Specify a user-defined threshold value (WMAX or WVAL keyword).

  Each new measurement of the system variable made at the expiration of an interval is compared to the threshold value. When this value exceeds a maximum threshold or is less than a minimum threshold, a warning condition exists and warning messages are sent automatically to the BBI-SS PAS Journal log.

  Note: The LOG DISPLAY option on the MAINVIEW for DB2 Primary Option Menu can be used to view the BBI-SS PAS Journal log.

- Send warning messages also to the MVS console through the write-to-operator (WTO) facility (WMSG keyword).
- Specify the number of warnings to be sent for one exception condition (WLIM keyword), the number of times the exception is detected before the first message (WIF keyword), and the number of times the exception is detected between messages (WIN keyword).

These options can be used to avoid situations where a condition often varies just above and below the threshold, triggering many messages. For example, a condition could be checked every 30 seconds with a warning only if that condition persists for 3 minutes, repeated warnings only after another 5 minutes, and a limit of 10 warnings (the problem is known and investigated by then).

Monitor Request Title

A monitor request is identified with a title. If a parameter is specified for a requested service, the parameter is shown with the title. The title and applicable parameter for each request are shown in the

- PLOT graphic display of the data collected by the requested
- Active Timer Requests panel (see “Request Status” on page 69)
- DMON or DWARN active monitor summary display
- Warning message issued when the measurement of the resource exceeds a threshold defined for the monitor

If a parameter is not used for the monitor request, the PLOT display and the warning message show the default (TOTAL) for that field.

Each service has a default title that can be customized. This process is described in “Service Table Definition” in the *MAINVIEW for DB2 Customization Guide*. The default titles of all the monitor services are listed in Part 4, “Monitors (Early Warnings/Recent History)” on page 321.

When requesting a monitor service, you can use the TITLE keyword to make the title more meaningful to the installation for that specific request. A user-defined title can be 1 to 24 characters in length. The title can be defined in a data entry panel (see “Start Workload or Resource Monitor (S Line Command)” on page 362) or with a SET request in the Service Display panel (see “The SET Timer Request” on page 75). If a title is defined with a SET request, the title must be enclosed in single quotes.

Warning Message Format

Each resource or workload monitor service has a unique warning message associated with it. A warning message is issued when the condition established by you is detected by the monitor service, as described in the preceding section. The format of a warning message is

```
ccnnn0W (nn) hh:mm:ss title(parm) = v [IN x intrvl] [srvdata] (>thrshld) *****
```

where

ccnnn0W — Is the warning message ID issued by the requested monitor service.

- cc — Is a two-character code for either a resource monitor or workload monitor. DS indicates resource monitor. DW indicates workload monitor.
- nnn — Is the numerical message identifier associated with the requested service.
- W — Represents a warning message.

(nn) — Is the number of times the warning message was issued.

hh:mm:ss — Is a timestamp in hours, minutes, and seconds.

title — Is a default or user-defined title for the service (see “Monitor Request Title” on page 63).

(parm) — Is an optional parameter that is part of the reqid (service select code plus parameter) for the SET request, as described previously. (TOTAL) is the default if a parameter is not specified for the service request.

v — Is the current measured value.

IN x intrvl — Is the time specified for the resource sampling with the INTERVAL keyword of the SET request where

- x — Can be nn, nnnn, hh:mm:ss, or mm:ss (n is a numeric value; hh is the number of hours; mm is the number of minutes; and ss is the number of seconds).
- intrvl — Is units of time measurement which can be SEC or MIN.

  Note: Time measurement units are not used for hh:mm:ss.

This text is included in the warning message only when a COUNT data type is measured (see “Data Measurements” on page 62).

srvdata — Is an additional field (12-character maximum) used for identification data issued specifically by the MXLOK monitor service. See the service description on page 391 for a definition of the data displayed.

(>thrshld) — Is the threshold value specified by the WMAX or WVAL keyword of the SET request for the monitor service. (A less-than sign (<) is used for a minimum threshold.)

***** — Emphasizes the message in the BBI-SS PAS Journal log.

When a threshold is exceeded, a warning message is sent and a warning condition exists. The DWARN service, described on “Monitor Display Services” on page 66, can be used to show all current warning conditions. When the condition that caused the warning no longer exists, the following condition clear message is issued:

```
ccnnn1I hh:mm:ss title(parm) NO LONGER > value
```

where

ccnnn1I	Is the same as the warning message ID number except a 1 replaces the 0 in the last digit and I replaces W. The 1 indicates the detected threshold no longer exists; the I indicates this message is informational.
title	Is the same as the warning message title.
(parm)	Is the same as the warning message parameter.
value	Is the threshold value specified by the WMAX keyword of the SET request for the monitor service.

For example, the warning message ID for the THDQD service is DS0090W. If the user request is

```
SET
REG=THDQD,WMSG=WTO,WMAX=5,T='QUEUED THREADS'
```

and the sampled measurement is greater than 5 threads at 1:00 PM, the following DS0090W message is issued:

```
DS0090W(01) 13:06:01 QUEUED THREADS(TOTAL) = 7 (>5)
```

When the condition no longer exists, the following DS0091I message is issued:

```
DS0091I(01) 13:30:00 QUEUED THREADS(TOTAL) NO LONGER > 5
```

Note: Since multiple DB2 subsystems can be monitored from one BBI-SS PAS, the target system is identified in these messages. In the Journal log, the target name is in the origin identifier field (scroll left to view). WTO messages have both the BBI-SS PAS ID and the target (TGT=xxxx) appended at the end of the message text.

Monitor Display Services

The DB2 data collected by monitor service requests can be displayed online, or the displays can be logged for later analysis. They can be requested from an active timer request list (see Chapter 18, “Active Timer Requests (Option 3)” on page 347).

The monitor-collected data can be displayed by the display services:

- PLOT

  The PLOT service provides a graphic display of the history data collected for one monitor request. A range distribution of the measured values, the maximum value ever measured, and rates-per-second present effective DB2 problem analysis.

- DMON

  The DMON service provides a scrollable display of the most current, active monitor measurements. Each line has a simple graphic representation of how close the measurement is to the defined warning threshold.

  DMON identifies potential problems quickly by showing several measurements together, such as the number of active threads, the number of database data sets open, the percent of buffer pool utilization, and SQL activity. You can also use this service to see how many monitors are close to their warning thresholds.

- DWARN

  The DWARN service provides a scrollable display of current, measured values like DMON, but only for monitors that have a warning condition resulting from measured values exceeding user-defined thresholds. An empty DWARN display indicates a healthy DB2.

These displays are described in detail in Chapter 6, “General Commands and Services” on page 73.

Traces

Trace services collect and display data about transaction processing in DB2.

Data Collection

Data is collected for application traces and workload monitors using IBM's Instrumentation Facility Interface (IFI) (see "Collecting Trace Data" in Volume 2).

Application Tracking and Display

As described in "Using a Trace" in Volume 2, a trace is activated by a request for the ATRAC monitor. The request can be tailored so that only the trace data needed to detect and solve problems is collected. The request specifies data collection categories, different selection criteria such as *elapsed time greater than 10 seconds*, and specific workloads such as by plan or authorization ID.

The traced data is viewed in integrated displays so that it is easy to see which scans, sorts, or I/Os are caused by which SQL statements without manual correlation. Summary displays provide high-level quick answers such as which SQL statement is consuming the most elapsed or CPU time. A chronological event trace shows a replay of the exact sequence of traced events. Details can be hidden to improve understanding of event flow or revealed when needed for detailed analysis.

Logging Traces

Both summary and detail trace data can be logged to external VSAM data sets. Each trace request is assigned its own data sets at the time of the ATRAC request.

- "Specifying Trace Logging Options" in Volume 2 describes each of the trace logging options.
- "Managing History Traces" in Volume 2 describes how to display the historical trace data and how to use the History Traces application.
- "Printing a Trace" in Volume 2 describes how to submit batch jobs to print the trace data.

Logging Analyzer and Monitor Displays

An MVDB2 display can be logged in different ways:

- At display time to the TS Image log by entering a Y for the yes option in the LOG field of the display (prints only what is displayed)
- After display to a BBISPRNT data set by pressing the SCREEN PRINT key (PF4)
- Without user interaction to the BBI-SS PAS Image log automatically by requesting automatic logging of an analyzer or monitor display service

  Specifying an Image log request for a monitor service logs a PLOT display of the monitor-collected data to the BBI-SS PAS Image log.

An Image log request can be made by selecting a data entry panel from an analyzer service list (see "Start Image Log Request (I Line Command)" on page 124). The logging of a monitor PLOT display is coordinated automatically by specifying a LOG parameter with the monitor request. A convenient logging frequency for a complete monitor history is at the end of each period (ATPD). A period is the completion of 10 time intervals. A display can also be logged at each interval (`LOG=ATINTVL`), only once at the completion of the request (`LOG=ATSTOP`), or only when a warning condition is detected (`LOG=ATWARN`). Logging of an analyzer display is automatically set to ATINTVL.

DMON and DWARN display logging can also be requested for active monitors, as described in "Automatic BBI-SS PAS Image Logging of Monitor Summary Displays" on page 69.

The Image log records can be printed offline using the IMRPRINT utility (BBSAMP member ILOGJCL), as described in the *MAINVIEW Administration Guide.*

The screen print images on BBISPRNT can be printed using the SLOGJCL member of BBSAMP.

Automatic BBI-SS PAS Image Logging of Analyzer Displays

The timer facility (SET service requests) can be used to automatically invoke a DB2 analyzer service and log the display at a user-specified interval to the BBI-SS PAS Image log. LOG= ATINTVL is the default.

For example:

```
SET
REQ=DB2ST,I=00:05:00
```

requests Image logging of the DB2 System Status display every five minutes.

Automatic BBI-SS PAS Image Logging of PLOT Display

Defining logging for a monitor request automatically logs a graphic plot display to the Image log, as shown by the following request from the Service Display panel:

```
SET
REQ=SQLAC,DDL,I=00:01:00,LOG=ATPD
```

This request invokes the SQLAC data collection monitor to collect the number of SQL DDL statements at one minute intervals. At the end of each complete period (LOG=ATPD), which is 10 intervals, a plot display of the data is logged to the BBI-SS PAS Image log. For this request, a plot is logged every 10 minutes.

Automatic BBI-SS PAS Image Logging of Monitor Summary Displays

A summary of active monitor status can be logged to the Image log with DMON or DWARN, as shown by the following requests from the service display panel:

```
SET
REQ=DMON,I=00:10:00
```

logs the DMON service display, which shows the current status of all active monitors every 10 minutes.

```
SET
REQ=DWARN,I=00:01:00,LOG=ATINTVL
```

logs the DWARN service display, which shows the current status of all active monitors with a warning condition, every minute.

Request Status

The Active Timer Requests panel (Option 3) lists standard monitor service requests and any additional timer-driven data collection services and timer-driven Image logging requests. It shows how many requests are already active and provides direct access to the data collected by that request. You can access input panels that allow current options to be viewed or modified, purge an active request, or replicate a request as a model to start a new request as described in “Line Commands” on page 353.

The Current Traces panel (Option 4) is similar to the Active Timer Requests panel, except the list of services shows only current trace requests.

The Display Statistics and Defaults panel (Option 6) provides general information about the Timer Facility, showing status information, some statistics, default parameters in effect, and a summary of the active timer requests. The information is shown for the BBI-SS PAS associated with the specified target (`TGT===>`). (See “Display Timer Facility Statistics (Option 8)” on page 106.)

Grouping Requests

Multiple timer-driven services can be started by defining a series of requests in a member of the BBI-SS PAS BBPARM data set. The member can be started from a TS or automatically when the BBI-SS PAS starts, as described in “Request Initiation” on page 76.

Issuing DB2 Commands

An authorized user can issue valid DB2 commands in the COMMAND line of any MAINVIEW application running in full-screen mode. The command results are shown in the Log Display. (See *Using MAINVIEW* for a description of the Log Display.)

The command syntax is

Syntax	**Example**
-db2cmd	-DIS THD(*)

where db2cmd is the DB2 command. Each command must have a - character as a prefix.

The command is issued against the DB2 specified in the TGT field.

Accessing RxD2

RxD2/FlexTools is integrated with all the MAINVIEW products. The RxD2/FlexTools facility integrates with the MAINVIEW products to provide quick access to information from the DB2 catalog or other DB2 tables.

Note: Access is possible to remote DB2 subsystems only if connected with DDF to a local DB2 (in the same MVS system as the TS).

Access with Hyperlinks

Expand buttons in many MAINVIEW for DB2 Analyzer and Trace displays provide quick hyperlinks to corresponding RxD2 displays and functions; for example:

- EXPLAIN information for a currently executing SQL statement, either static or dynamic
- SQL text and EXPLAIN/execute options for static SQL captured in a trace
- Catalog information for selected database objects

Access from a Menu Option

When installed, RxD2/FlexTools appears as an option on the MAINVIEW for DB2 Primary Option Menu. Choosing the RX option leads directly to the RxD2/FlexTools menu.

Access from the Command Line

When RxD2/FlexTools is installed, RX appears in the upper right corner of all service displays. You can type RX on the COMMAND line, optionally followed by a subcommand and parameter(s) to invoke the RxD2/FlexTools services directly from any of the application panels of MAINVIEW for DB2 or any other BBI products. The RX commands can be entered on a COMMAND line or in a SERV field.

RX entered alone accesses the RxD2/FlexTools Primary Option Menu. The options provide direct access to plan information (PL), EXPLAIN data from a PLAN_TABLE (PT), a table (TB), or an index (IX).

Hyperlinks to MAINVIEW for CICS or MAINVIEW for IMS

You can expand directly to a related MAINVIEW for CICS or MAINVIEW for IMS display and return to MAINVIEW for DB2, as follows:

- For an active CICS thread
  - LOCKE expands to the MAINVIEW for CICS DB2TASK display
  - DUSER expands to the MAINVIEW for CICS TASKXPND display for that user
- For a CICS region attached to DB2
  - CICSR expands to the MAINVIEW for CICS DB2TASK list of DB2 threads
- For an active IMS thread
  - LOCKE expands to the MAINVIEW for IMS Region Summary display
  - DUSER expands to the MAINVIEW for IMS Region Summary display for that PST

Color Support

The DB2ST resource analyzer display, PLOT, DMON, DWARN, and Active Timer Request list application use color for graph output as described below (any color monitor can be used). The graph colors cannot be modified.

- DB2ST - DB2 System Status

  This resource analyzer display (see “DB2ST—DB2 System Status” on page 129) uses color in the pool and CPU usage graphs as follows:

Pool Utilization	Usage graph is shown in	
	Turquoise	Value is below the deferred-write threshold.
	Yellow	Value exceeds the deferred-write threshold, but it is less than the critical threshold.
	Red	The critical threshold.
CPU Utilization	Usage graph is shown in turquoise.	

- Plot Display

  The plot displays shown by the Active Timer Requests list application and the PLOT, DMON, and DWARN services use the same colors. These are

Red	Warning status.
Turquoise	Normal values for the current interval.
Yellow	Values for the current period are greater than the values for the previous period.

Chapter 6. General Commands and Services

Note

This section is generally used only for reference.

See *Using MAINVIEW* for information on the General Services options accessed from the Primary Option Menu.

The general commands can be used for either the analyzer or monitor services. These commands

- Provide automatic time-interval processing to start, modify, or purge monitors and to request automatic image logging of displays.
- Plot monitor data.
- Display monitor status, criteria, and warnings.
- Help the system programmer control and maintain MVDB2 service availability.

The general services are common to more than one online BMC Software product. These common online services are accessed from the Primary Option Menu. They can be used to

- Define an automatic refresh cycle of the service displays.
- View the messages and commands written to the Journal log.
- View a detailed explanation of a service message.
- Select a tutorial about the BBI-SS PAS environment and the installed BMC Software products.
- See what is new in the current release of MAINVIEW for DB2.

Table 7 shows the use of the general commands and services.

Table 7. General Commands and Services

General Command	Execution	Page
SET	Initiates and controls data collection for the timer-driven monitor services from a setup panel.	75, 366
	Initials and controls data collection for the trace services from a setup panel.	75
	Initiates and controls timer-driven image logging of service output displays.	75, 124
PLOT	Displays graphic plot of data collected by a monitor service. Select in Active Timer Request panel or EXPAND from DMON or DWARN.	95, 101, 103, 347
DMON	Displays activity summary and status of all monitor requests. Use DM application transfer command.	101
DWARN	Displays activity summary and status of only the monitor requests in a warning condition. Use DW application transfer command.	103
LOCK, ULOCK, TEST	Controls and maintains services.	105
General Service	**Execution**	**Reference**
Note: Select from the Primary Option Menu.		
C REFRESH	Refreshes a series of displays in a timed cycle as specified by the user.	*Using MAINVIEW*
L LOG DISPLAY	Displays the BBI-SS PAS or TS Journal log.	*Using MAINVIEW*
M MESSAGES	Displays a list of all messages and codes that can be generated.	*Using MAINVIEW*
K KEYS	Displays the TS PF key assignments.	*Using MAINVIEW*
T TUTORIAL	Displays a tutorial main menu from which topics about the services or the BBI-SS PAS environment can be selected.	*Using MAINVIEW*
X EXIT	Terminates the TS.	*Using MAINVIEW*

The SET Timer Request

The SET request is used to initiate, modify, or purge timer-driven services for

- Data collection monitors or trace services
- Service output display image logging

It can be activated from any Service Display Panel, for example, DB2ST, which is selected from the MAINVIEW for DB2 Primary Option Menu (Option 1). Figure 4 shows the results of specifying a SET request in the SERV and PARM fields and pressing ENTER. Such requests are more easily made in the data entry panels described in the appropriate sections, such as "Using a Trace."

```
BOOLE AND BABBAGE---------- TIMER-DRIVEN REQUESTS   -----------PERFORMANCE MGMT
SERV ==> SET             INPUT    12:41:33  INTVL=> 3  LOG=> Y  TGT==> DB2A
PARM ==> REQ=THDQD,WMSG=WTO,WMAX=4,WLIM=5,LOG=ATWARN             SCROLL=> CSR
         ....+...10....+...20....+...30....+...40....+...50....+...60....+...70
REC POS  TYPE  REQ-ID/MEMBER    RESULT    ERROR MESSAGES
      1  REQ   THDQD            ACCEPTED

REQUESTS:  TOTAL ACCEPTED    1, REJECTED    0     NOT SHOWN: ACC    0, REJ    0
```

Figure 4. SET Timer Request Service Display Panel

Select Code: SET

Parameter: "Keywords" on page 80 describes the keyword options that can be entered in the 55-byte parameter line of the Service Display Panel (PARM field) or in the option fields of the Timer Request panels.

Messages: Lines 5 through 24 of the Service Display Panel display messages in response to a request. The request that was entered remains on the screen for reference when reading the completion or error message.

Description: This service is used to request, modify, or purge timer-driven services. Only authorized users or the user that created the request can purge or modify an existing request.

Service Requests

SET can be used to request timer-driven

- Data collection by DB2 monitor trace services
- Image logging of DB2 analyzer or monitor status displays

Request Initiation

A service request begins with one of the following keywords:

REQ=reqid	Defines a new request or continues a held request.
MOD=reqid	Modifies an existing request.
BLK=membername	Identifies a BBPARM data set member that contains a group of service requests.

Service Request ID (reqid)

A service is uniquely defined in a request by its reqid. The reqid is the service select code (ssc) and, if necessary, a parameter, as follows:

```
REQ=ssc,parameter
```

Duplicate requests are not allowed; however, multiple requests for the same service can be active concurrently if the reqid for each request has a unique parameter. For example, all queued threads (REQ=THDQD) or the number of queued threads to TSO (REQ=THDQD,TSO) or to batch jobs (REQ=THDQD,BATCH) can be measured.

The original reqid must be specified to modify or purge an active service request. To purge the THDQD service monitoring queued batch threads, the SET command must be

```
SET PRG=THDQD,BATCH [keywords]
```

If the BATCH parameter is not specified, the service monitoring the total queued threads is purged.

Single Requests

Single request keyword options can be entered in the parameter field of the timer request panels or in the DB2ST display panel (Option 1). The DB2ST parameter field is 55 bytes long. As many keyword options as can fit in this space can be entered. If all the options do not fit in the parameter line, the option HOLD=YES can be used to hold the request until it can be completed with a second SET request with the same reqid.

Multiple Requests

A series of valid request keyword options for SET can be predefined in a member of the BBPARM data set. There are several sample block request members in the BBPARM data set named BLKxxxxx. BLKDMR1P is a sample member to purge the requests set by BLKDMR1. BLKDMRW is a suggested starter set of monitors.

Each request can start anywhere in a line from columns 1 to 79 and can continue onto the next line.

There can be one group for each DB2 subsystem. Requests for display logging and starting monitors can be specified; for example, member BLKDB2A in BBPARM could contain

```
REQ=DB2ST   I=00:06:00 LOG=ATINTVL
REQ=DB2EX   I=00:01:00 LOG=ATINTVL
REQ=LOCKD   I=00:01:00
REQ=DWARN   I=00:01:00
REQ=DSUTL,WMAX=70,WLIM=3,LOG=ATINTVL
REQ=CONUT,WMAX=90,WLIM=3,LOG=ATINTVL
REQ=THDUT,WMAX=80,WLIM=3,LOG=ATINTVL
REQ=EDMUT,WMAX=90,WLIM=3,LOG=ATINTVL
REQ=BPUTL,WMAX=60,WLIM=3,LOG=ATINTVL
REQ=CSAP,WMAX=90,WMSG=WTO,WIF=2,WIN=5,WLIM=6,LOG=ATINTVL
```

The member can be started by specifying the BLK keyword and BBPARM member name in the parameter field for the SET timer request as

```
SET
BLK=BLKDB2A
```

Note: The BLK keyword cannot be used in a request within a BBPARM member.

The member names must identify previously created members of a PDS, like BBPARM, allocated to the BBI-SS PAS with the ddname IMFPARM (see the SSJCL sample member in BBSAMP). The record length must be 80 characters; blocksize can be any multiple of 80.

A SET BLK request is logged to the BBI-SS PAS Journal log. Any errors in the requests issued with SET BLK are also logged to the BBI-SS PAS Journal log.

Automatic Startup of Multiple Requests

Multiple requests can be started when the BBI-SS PAS starts. The name of the BBPARM member containing the block of requests is specified in the BBIISP00 member of BBPARM. The parameters are TARGET, BLK, and USRID and AUTOID. TARGET defines the DB2 subsystem to be analyzed or monitored. BLK specifies the BBPARM member name to be started. USRID or AUTOID specifies the identifier of the user. TARGET, BLK, and USRID must be written on the same line and can be repeated for different targets. TARGET and BLK are required; USRID is optional. AUTOID is required and is written on a separate line from TARGET and BLK; for example:

```
AUTOID=ADMIN
TARGET=DB2A,BLK=BLKDB2A
TARGET=DB2B,BLK=BLKDB2B
TARGET=DB2C,BLK=BLKDB2C
```

or

```
TARGET=DB2A,BLK=BLKDB2A,USRID=$TDB2AR
TARGET=DB2B,BLK=BLKDB2B,USRID=$TDB2BX
TARGET=DB2C,BLK=BLKDB2C,USRID=$TDB2C
```

If the USRID parameter is not specified, the default is AUTOID.

This example assumes there are three active DB2 subsystems. The analyzers and monitors defined in BLKDB2A extract data from the DB2A subsystem and are associated with the userid $TDB2AR. The analyzers and monitors defined in BLKDB2B extract data from the DB2B subsystem and are associated with the userid $TDB2BX.

Note: If the target DB2 is not active, the QIS option defines the action to be taken for each request. The default is to quiesce until the target DB2 starts.

Multiple Request Comments

Comments can be entered in a block request member of BBPARM. A comment is delimited by the * sign. The commented text begins and ends with an * sign. A warning indicator is issued when invalid characters, which are treated as blanks, are encountered.

Note: If line numbers are used in a block request member, each number should be preceded by an * sign.

Request Termination

A service request can be terminated with the following SET request:

```
SET
PRG=reqid
```

Purges an existing request.

SET Keyword Parameter Options

The tables that follow describe the keyword parameters that can be specified with a SET request.

Nonmodifiable Keyword Options

Certain options, described in “Keywords” on page 80, cannot be modified (MOD=reqid) because previously collected history would be distorted. These options are

INTERVAL
RANGES
START
TITLE
HOLD

HOLD cannot be used for a request being modified. If a change needs to be made to one of these options for an active request, the request must be purged and a new request entered.

Selection Criteria

Trace and workload monitor requests can be qualified with selection criteria keywords as described in the tables in “Keywords” on page 80. Once a trace request is activated, only certain keywords can be changed. To change the others, the trace request must be stopped and reactivated. See “Modifying a Trace” in Volume 2.

A + character can be used as a generic name qualifier for a workload monitor or summary trace request. It is not valid for a detail trace request.

Keywords

The syntax for entering keyword options is free format and keyword-oriented. Any number of blanks, commas, slashes, or parentheses can be interspersed in the text between keywords to improve readability; they are ignored during request processing. The equal sign between keyword and operand is optional, but is recommended to improve readability.

The SET keywords define a timer request function. Table 8 describes each function and the keywords that are used. It is an index to the tables that follow. Each table groups the keywords by function, lists the keywords alphabetically, defines applicable operands, and describes what the keyword does.

Table 8. SET Keywords

Table Title	Keywords
SET Keywords to Define Requests	BLK MOD PRG REQ
SET Keywords to Define Request Activation	HOLD INTERVAL RST START STOP STOPCNT TARGET|TGT
SET Keywords to Define Warnings (Monitors only)	WIF WIN WLIM WMAX|WVAL WMSG
SET Keywords to Define Special Options	LOG PLOTMAX QIS RANGES TITLE|T
SET Keywords to Define Application Trace Parameters for ATRAC	GROUPSQL LOGTRAC STORAGE TRBUFF TRSIZE TYPE WRAP
SET Keywords to Define Workload Selection Criteria for ATRAC and Workload Monitors **Note:** ICHECK is not valid for ATRAC. AND logic is used for keywords. OR logic is used for keyword operands.	CONNTYPE DB2AUTH DB2CONN DB2CORR DB2LOC DB2PKG DB2PLAN ICHECK

Table 8. SET Keywords (Continued)

Table Title	Keywords
SET Keywords to Define Trace Logging for ATRAC	TRARCSTC TRCYL TRDISP TRDSN TRNUMDS TRREUSE TRSMSDCL TRSMSMCL TRSMSSCL TRSWTIME TRSUFFIX TRVOLS
Keywords to Define Exception Filters for Application Trace	ABORT CLAIMDR CPU ELAP GETPAGE GETRIO HPFAILS INCRBIND LOCKESCL LOCKSUSP LOCKTBL MAXLOCK PFREADS PFREQS PGUPD PRLLFALB PRLLGRP PRLLRED PWAITIO PWAITLK PWAITOT PWAITPF READIO RIDFAIL RLF SQLCTL SQLDDL SQLDYN SQLFETCH SQLSEL SQLTOT SQLUID TIMEOUT UIDCOM

Table 9. SET Keywords to Define Request Activation

Keyword	Operand	Description	Service
BLK		Identifies a member in BBPARM that contains predefined service requests.	All
	mname	Member name in BBPARM.	
	RRR	Resets all requests according to their RST options. This is the same as starting DB2 after the requests were quiesced. This operand could be used at midnight to reset statistics for daily monitors.	
	SSS	Used internally to start services at DB2 startup.	
	ZZZ	Used internally to quiesce services at DB2 shut down.	
MOD	reqid	Modifies an existing request.	All
PRG		Purges existing request or requests (frees the request block).	All
	reqid	Purges a single request.	
	ALL	Purges all existing requests if the user is authorized.	
REQ	reqid	Defines a new request or continues a held request.	All

Table 10. SET Keywords to Define Request Activation

Keyword	Operand	Description	Service
HOLD	YES	Holds this request until the definition is completed with another SET with the same reqid. Use it to specify more keywords than will fit on the 55-byte parameter line of the Service Input Panel.	All
	NO	Default is NO.	
INTERVAL|I	hh:mm:ss	The time interval between successive invocations of the requested service. The default is one minute (00:01:00) or as specified by the user in the BBIISP00 member of the BBPARM data set. It can be used with the LOG keyword to request automatic logging of a display to the BBI-SS PAS Image log.	All
RST		Defines the restart option to be used when a service is quiesced because of an inactive DB2 subsystem or SETBLK=RRR request. Default is HOT.	All
	HOT	Restarts the service automatically without the loss of history data. The intervals during which DB2 was terminated show values of zero.	
	COLD	Restarts the service automatically; all previously collected data is deleted.	
	PUR	Purges the service automatically when the target DB2 starts.	
	QIS	Keeps the service in a quiesced state until it is purged by an authorized user.	
START	hh:mm:ss	Requests processing start time. If the time entered is more than 10 minutes prior to the current time, 24 hours are added to the specified time and the request is started the next day. To start a request at midnight, specify 24:00:00. Default is the next full minute.	All
STOP	hh:mm:ss	Requests processing stop time. If the time entered is the same as the START time, 24 hours are added to the STOP time. Processing ends at the end of the last interval before the specified stop time. This time is displayed in the STOP field when the request is viewed with the R, P, M, and W line commands.	All

Table 10. SET Keywords to Define Request Activation (Continued)

Keyword	Operand	Description	Service
STOPCNT	n	Number of intervals (number of minutes for a trace) to be processed. Requests that have completed without collecting history data are purged. Default is no limit. Requests are processed until stopped or purged or until the BBI-SS PAS is terminated.	All
TARGET| TGT	subsystem ID	TARGET is used to override the default target DB2 subsystem identified in the TGT field. Valid entries are a 1- to 4-character DB2 subsystem identifier. (AutoOPERATOR must be installed.) TARGET is required if the IMFC command is used in an AutoOPERATOR EXEC to request analyzer or monitor services. A message is issued to the BBI-SS PAS Journal log if this keyword is not coded in the request.	All

Table 11. SET Keywords to Define Warnings (Monitor Services Only)

Keyword	Operand	Description	Service
WIF	n	Defines the number of times the exception is to be detected before the first message is sent. Default is 1.	Monitors
WIN	n	Defines the number of times the exception is to be detected between messages. Default is 1.	Monitors
WLIM	n	Defines the maximum number of warning messages to be sent for one continuous occurrence of the warning condition. Resets automatically when condition no longer exists. Default is 10.	Monitors
WMAX|WVAL	n|<n	Specifies a warning threshold. The warning condition exists if the current data measurement exceeds the defined threshold. If <n is specified, a warning is issued when the sampled value is less than or equal to the threshold.	Monitors
	NZ	NZ (not zero) issues a warning when the measured value is greater than zero. Default is 0 or no warnings. If the service measures time, the measurement units are specified in seconds and tenths of seconds (optional).	
WMSG	WTO|LOG| tso id	Directs warning messages to the system console (WTO) or a TSO ID in addition to the active BBI-SS PAS Journal log. Default is to write only to the log. If an ID is entered, a TSO send is done for the warning and warning clear messages, but not for the monitor start / stop / quiesce messages. Only one TSO ID (not WTO or LOG) can be specified. An existing warning message to the WTO can be reset to the Journal log only by using the LOG operand. Routing and descriptor codes can be specified for WTO messages in the BBIISP00 member of the BBPARM data set.	Monitors

Table 12. SET Keywords to Define Special Options

Keyword	Operand	Description	Service
LOG		Specifies if and when automatic logging occurs. Analyzer, DMON or DWARN, or PLOT displays can be logged to the BBI-SS PAS Image log. For the monitors, a PLOT of the latest data is written to the BBI-SS PAS Image log.	All
	NO	No logging. Default for monitor services.	
	ATSTOP	Logs display when processing of this request is stopped. If QIS=Y has been specified in the request, LOG=ATSTOP is invoked at DB2 termination and at BBI-SS PAS termination.	
	ATPD	Logs display at each period of 10 intervals.	
	ATINTVL	Logs display at each interval as specified by the user with the INTERVAL parameter or in the BBIISP00 member of the BBPARM data set. Default for analyzers.	
	ATWARN	Logs a plot whenever a warning message is generated by the associated monitor. NO is the default for the monitor services. ATINTVL is the default for the analyzer services.	
PLOTMAX	n	Specifies the maximum value for the X-axis of a PLOT graph. Minimum is 50. The specified value is adjusted to the nearest multiple of 50. Percentages displayed by some services are always set at 100.	Monitors
QIS		Defines the action to be taken for the service when DB2 is not active.	All
	YES	Specifies that the service is to be quiesced. This is the default for all analyzer and monitor services.	
	NO	Specifies that the service is to start or continue running. **Note:** When QIS=NO is specified, monitors that require DB2 continue to be scheduled at each interval; however, they return zero values. Any analyzer services set up to run asynchronously fail with a short message of CANNOT LOCATE DB2 SPECIFIED in the first line. The BBI-SS PAS Image log contains screen images of these services.	

Table 12. SET Keywords to Define Special Options (Continued)

Keyword	Operand	Description	Service
RANGES	n [,n,n,n]	Up to four upper-limit values can be specified for the distribution range of any data collection monitor service. An implied limit of the maximum data measurement value is always defined internally. This information is used to produce a frequency distribution of the data measurement value at the bottom of the plot display (see "Monitor History Display (PLOT)" on page 95). If RANGES is defined, the distribution is updated at each interval with the current measurement value. A plot of the history displays this distribution. Default is no ranges.	Monitors
TITLE|T	'c...c'	Defines a service display title and the contents of a warning message (1 to 24 characters). This user-defined title replaces the default service title. If the title is specified with SET as a single request or in a BBPARM member as a series of requests, it must be enclosed in single quotes.	ATRAC

Table 13. SET Keywords to Define Application Trace Parameters

Keyword	Operand	Description	Service
GROUPSQL	Y|N	Identical SQL events are grouped into one for detail traces to reduce buffer storage usage.	ATRAC
LOGTRAC	N|Y	Y writes all trace records for this request to a unique trace log data set (TLDS) for this trace (MVDB2 ATRAC service only). Default is N. If Y is specified with no additional summary or detail trace logging options, a single data set is dynamically allocated using the defaults specified in DMRBEX00 for this DB2.	ATRAC
STORAGE| ST	nnnK	Specifies the size of the BBI-SS PAS display buffer to be used by the ATRAC service. The default is obtained from member IMFISP00/BBIISP00 of the BBPARM data set.	ATRAC
TRBUFF	nnn	Number of trace buffers to allocate. The default is obtained from member DMRBEX00 of the BBPARM data set.	ATRAC
TRSIZE	nnnK	Size of trace buffer to use. The default is obtained from member DMRBEX00 of the BBPARM data set.	ATRAC
TYPE	S|D|SQL| SCAN|IO| LOCK|DDF| DDFVTAM	S requests a summary application trace of completed transactions. D requests a detail application trace that collects major events in the life of the transaction, including all exception events. The default is a summary trace. The following suboperands collect additional events for a detail trace: SQL Detail trace plus SQL events SCAN Detail trace plus scan and SQL events IO Detail trace plus I/O events LOCK Detail trace plus lock requests DDF Detail trace plus all DDF events except VTAM-related DDF events DDFVTAM Detail trace plus VTAM-related DDF events Multiple suboperands can be specified. They must be enclosed within parentheses. For example, TYPE=(DDF,LOCK) generates a detail trace with basic DDF and locking events.	ATRAC
WRAP	YES|NO	Determines trace data wrap in BBI-SS PAS buffer. Default is YES; new data overlays oldest data. NO stops the trace when the buffer is full. MOD=ATRAC, WRAP=YES resumes the trace.	ATRAC

Table 14. SET Keywords to Define Workload Selection Criteria

Keyword	Operand	Description	Service
CONNTYPE	TSO IMS CICS BATCH CAF IMSMPP IMSBMP IMSTBMP IMSCTL DLI SYSSERV APLSERV UTIL blank	Qualifies a workload trace or workload monitor data collection by connection type. Blank collects data for all connection types.	ATRAC Workload Monitors
DB2AUTH	id	Qualifies a workload trace or monitor data collection by DB2 authorization ID. Summary Trace or Workload Monitor The maximum number of operands is the total field length (60 characters). Detail Trace The maximum number of operands is eight unless DB2PLAN is used. If more than one DB2PLAN operand is specified, only one authorization ID can be specified.	ATRAC Workload Monitors
DB2CONN	name	Qualifies workload monitor data collection or a summary workload trace request by a one- to eight-character connection name (for a detail trace, does not reduce data collection, only data retention). The maximum number of operands is the total field length (60 characters).	ATRAC Workload Monitors
DB2CORR	id	Qualifies workload monitor data collection or a summary workload trace request by a 1- to 12-character correlation ID (for a detail trace, does not reduce data collection, only data retention). The maximum number of operands is the total field length (60 characters).	ATRAC Workload Monitors

Table 14. SET Keywords to Define Workload Selection Criteria (Continued)

Keyword	Operand	Description	Service
DB2LOC	id	Qualifies workload monitor data collection or a summary workload trace request by a 1- to 16-character location name (for a detail trace, does not reduce data collection, only data retention). Specify an IP address in quotes. The maximum number of operands is the total field length (60 characters). **Note:** Both server and requester activity with this location is selected (DBAT and DIST threads).	ATRAC Workload Monitors
DB2PKG	name	Qualifies a workload trace or monitor data collection by a one- to eighteen-character DB2 package name (only when accounting class 7/8 is active). The maximum number of operands is the total field length (60 characters).	ATRAC Workload Monitors
DB2PLAN	name	Qualifies a workload trace or monitor data collection by a one- to eight- character DB2 plan name. Summary Trace or Workload Monitor The maximum number of operands is the total field length (60 characters). Detail Trace The maximum number of operands is eight unless DB2AUTH is used. If more than one DB2AUTH operand is specified, only one plan name can be specified.	ATRAC Workload Monitors
ICHECK		Qualifies workload monitor data collection (not valid for a workload trace).	Workload Monitors
	YES	The transaction is discarded if the elapsed time is greater than the requested interval time.	
	NO	NO is the default.	

Table 15. SET Keywords to Define Trace Logging

Keyword	Operand	Description	Service
TRARCSTC	name	Name of the STC to be initiated to archive data sets for this trace. The default is no archive STC.	ATRAC
TRCYL	n	Primary allocation in CYLS for trace log data sets. The default value specified in DMRBEX00 with the TRCYL keyword is 3.	ATRAC
TRDISP	NEW|OLD	NEW (default) indicates none of the data sets exist. All the data sets are allocated when the trace request is processed. If any of the data sets cannot be allocated, the trace request will fail and the data sets successfully allocated will be deleted. OLD indicates all the data sets exist and are valid trace data sets. Existing data will be overlaid. **Note:** If your user authorization specifies TRALLOC= NO, only OLD will be accepted.	ATRAC
TRDSN	name.V01	Name of the first log data set. It must end in .V01. The default name is generated if this keyword is omitted and TRDISP=NEW. If the keyword value has quotes, the name is used as specified. If quotes are not used, the TRPREFIX value specified in DMRBEX00 for this DB2 is added in front of the value supplied. If TRPREFIX was not specified, the ID of the user requesting the trace is used. If TRDSN= is specified without LOGTRAC=, LOGTRAC= Y is assumed.	ATRAC
TRNUMDS	n	Number of trace log data sets to be used for this trace. The default is 1. If TRNUMDS= is specified without LOGTRAC=, LOGTRAC=Y is assumed.	ATRAC
TRREUSE	|N	Indicates whether to overwrite a log data set that has not been reset. The default is Y.	ATRAC
TRSMSDCL	name	Name of the SMS Data Class to be used when allocating this trace data set. The default is specified in DMRBEX00 with the TRSMSDCL keyword.	ATRAC
TRSMSMCL	name	Name of the SMS Management Class to be used when allocating this trace data set. The default is specified in DMRBEX00 with the TRSMSMCL keyword.	ATRAC
TRSMSSCL	name	Name of the SMS Storage Class to be used when allocating this trace data set. The default is specified in DMRBEX00 with the TRSMSSCL keyword.	ATRAC

Table 15. SET Keywords to Define Trace Logging (Continued)

Keyword	Operand	Description	Service
TRSWTIME	hh:mm	Specifies the time an automatic log switch from the current log to the next log will occur.	ATRAC
TRSUFFIX	c...	Suffix to be appended to the cluster DSN to make the DSN of the data component. The default value specified in DMRBEX00 with the TRSUFFIX keyword is D.	ATRAC
TRVOLS	(x,y...)	Volume(s) to use when allocating a trace log data set. You can specify up to seven volumes. The default value specified in DMRBEX00 with the TRVOLS keyword is SYSDA. **Note:** Parentheses are required to specify multiple volumes.	ATRAC

Table 16. Keywords to Define Exception Filters for Application Trace

Keyword	Operand	Description	Service
ABORT	Y|N	Selects only the transactions that have abended.	Application Trace
CLAIMDR	nnn[K] |<nnn[K]	Qualifies a trace by the number of claim and drain failures (QTXACLUN + QTXADRUN).	Application Trace
CPU	hh:mm:ss|ss| <hh:mm:ss|<ss	Qualifies a trace by transaction CPU time.	Application Trace
ELAP	hh:mm:ss|ss| <hh:mm:ss|<ss	Qualifies a trace by transaction response time.	Application Trace
GETPAGE	nnn[K] |<nnn[K]	Qualifies a trace by the number of GETPAGE requests.	Application Trace
GETRIO	<nnn[K]	Qualifies a trace by the number of GETPAGE requests issued per READ I/O. **Note:** A < prefix should be used to define this value. The IBM *DB2 Administration Guide*, suggests that a ratio below 1.5 can initiate poor read efficiency.	Application Trace
HPFAILS	nnn[K] |<nnn[K]	Qualifies a trace by the number of hiperpool read or write failures (QBACHRF + QBACHWF).	Application Trace
INCRBIND	nnn[K] |<nnn[K]	Qualifies a trace by the number of incremental BINDs issued.	Application Trace
LOCKESCL	nnn[K] |<nnn[K]	Qualifies a trace by the number of lock escalations.	Application Trace
LOCKSUSP	nnn[K] |<nnn[K]	Qualifies a trace by the number of lock suspensions.	Application Trace
LOCKTBL	nnn[K] |<nnn[K]	Qualifies a trace by the number of LOCK TABLE requests.	Application Trace
MAXLOCK	nnn[K] |<nnn[K]	Qualifies a trace by the maximum number of locks held.	Application Trace
PFREADS	nnn[K] |<nnn[K]	Qualifies a trace by the number of prefetch read I/Os (QBACSIO).	Application Trace
PFREQS	nnn[K] |<nnn[K]	Qualifies a trace by the number of prefetch requests (QBACSEQ).	Application Trace
PGUPD	nnn[K] |<nnn[K]	Qualifies a trace by the number of page update requests.	Application Trace
PRLLFALB	nnn[K] |<nnn[K]	Qualifies a trace by the number of parallel I/O groups that fall back to sequential processing (QXDEGCUR + QXDEGESA + QXDEGBUF).	Application Trace

Table 16. Keywords to Define Exception Filters for Application Trace (Continued)

Keyword	Operand	Description	Service
PRLLGRP	nnn[K] |<nnn[K]	Qualifies a trace by the number of parallel I/O groups executed (QXTOTGRP).	Application Trace
PRLLRED	nnn[K] |<nnn[K]	Qualifies a trace by the number of parallel I/O groups executed at a reduced degree (QXREDGRP).	Application Trace
PWAITIO	nn |<nn	Qualifies a trace by the percent of elapsed time for I/O waits (QWACAWTI/QWACASC).	Application Trace
PWAITLK	nn |<nn	Qualifies a trace by the percent of elapsed time for locks (QWACAWTL/QWACASC).	Application Trace
PWAITOT	nn |<nn	Qualifies a trace by the percent of elapsed time for other waits ((QWACAWTE+QWACALOG)/ QWACASC).	Application Trace
PWAITPF	nn |<nn	Qualifies a trace by the percent of elapsed time waiting for prefetch to complete (QWACAWTR/QWACASC).	Application Trace
READIO	nnn[K] |<nnn[K]	Qualifies a trace by the number of READ I/Os issued.	Application Trace
RIDFAIL	nnn[K] |<nnn[K]	Qualifies a trace by the number of RID pool failures (QXNSMIAP).	Application Trace
RLF	nnn[K] |<nnn[K]	Qualifies a trace by the number of RLF exceptions.	Application Trace
SQLCTL	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL control statements, such as GRANT or REVOKE.	Application Trace
SQLDDL	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL Data Definition Language statements.	Application Trace
SQLDYN	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL PREPARE statements.	Application Trace
SQLFETCH	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL FETCH statements.	Application Trace
SQLSEL	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL SELECT statements.	Application Trace
SQLTOT	nnn[K] |<nnn[K]	Qualifies a trace by the total number of SQL statements.	Application Trace
SQLUID	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL UPDATE, INSERT, and DELETE statements.	Application Trace
TIMEOUT	nnn[K] |<nnn[K]	Qualifies a trace by the number of timeout / deadlocks (QTXATIM).	Application Trace
UIDCOM	nnn[K] |<nnn[K]	Qualifies a trace by the number of SQL UPDATE, INSERT, and DELETE statements issued per COMMIT.	Application Trace

Monitor Display Commands

This section describes the commands that can be used to activate display services to show the data collected by requested monitors.

Monitor History Display (PLOT)

The PLOT service generates a graphic display of historical data collected by a DB2 monitor service. If you have a color monitor, the graph will be displayed in the following colors:

Red	Warning status (value bypassed minimum- or maximum-defined threshold)
Turquoise	Normal values for the current interval

```
BOOLE AND BABBAGE----------    MONITOR HISTORY      -----------PERFORMANCE MGMT
SERV ==> PLOT            INPUT    12:26:34  INTVL=> 3  LOG=> N  TGT==> DB2A
PARM ==> DB2DP                                                   SCROLL=> CSR
TOTAL      96,120       DB2DP DEMAND PAGING                     START  11:58:00
   28 SAMPLES      PERIOD  00:10:00   INTERVAL  00:01:00      ELAPSED  00:28:00
AVG/INTVL--.----+----I----+----I----+----I----+----I----+----I  --- AVG/SEC ---
  TOTAL    .*************************          W            .      57.21
  PREV PD  .**********************************  W            .      74.99
  CURR PD  .*******************                 W            .      42.62
INTERVALS--.----+----I----+----I----+----I----+----I----+----I
 12:17:00  .*********                           W            .      19.17
 12:18:00->.*******                             W            .      15.78
 12:19:00  .************************************W****        .      91.15
 12:20:00  .************************************W*************     109.57
 12:21:00  .**********                          W            .      22.97
 12:22:00  .*************                       W            .      29.08
 12:23:00  .**********                          W            .      21.55
 12:24:00  .**************                      W            .      30.32
 12:25:00  .*********************               W            .      45.33
 12:26:00  .*********************************** W            .      75.97
           .----+----I----+----I----+----I----+----I----+----I
           0      1320      2640      3960      5280      6600 MAX AT 12:01:00
RANGE:      0->1220  1221->2440  2441->3660  3661->4880  4881->6758 ---TOTAL---
DISTR:      2    7%     8   29%     7   25%     4   14%     7   25%    28  100%
```

Figure 5. PLOT Sample Display

Select Code: PLOT

Parameter: reqid

Description: Displays data collected by a monitor service request.

Following is an area-by-area description of the display contents.

Area 1 - Monitor Statistics

```
TOTAL      96,120       DB2DP DEMAND PAGING                    START  11:58:00
   28 SAMPLES      PERIOD  00:10:00   INTERVAL  00:01:00      ELAPSED  00:28:00
```

TOTAL — Displayed for count-type services only. This field shows the sum of all values collected by this request.

SAMPLES — The number of data samples collected by this request.

PERIOD — The elapsed time for one period. It is equal to 10 times the interval value.

INTERVAL — The request sampling interval.

START — The request start time. The request may go inactive at start time if the DB2 subsystem is not active and QIS=YES (the default) was specified when the service was defined.

ELAPSED — The cumulative active time for the request. If the request is not currently active, this field contains the elapsed time at the point when the request became inactive.

Area 2 - Averages Per Interval

```
AVG/INTVL--.----+----I----+----I----+----I----+----I----+----I
  TOTAL    .*************************          W            .
  PREV PD  .*********************************  W            .
  CURR PD  .******************                  W            .
```

TOTAL	The average sample value over the life of the service.
PREV PD	The average sample value for the preceding period of ten interval samples.
CURR PD	The average sample value over the most recently completed period of ten interval samples. At the end of the period, the PREV PD value is replaced with this average.
W	The warning threshold marker (a WVAL warning threshold must be defined with the SET request for the service). If the PLOTMAX value is less than the WVAL value, the W marker is not displayed.

Area 3 - Interval Sample Values

```
INTERVALS--.----+----I----+----I----+----I----+----I----+----I----+----I
 12:17:00  .*********                           W            .
 12:18:00->.*******                             W            .
 12:19:00  .************************************W****        .
 12:20:00  .************************************W*************
 12:21:00  .**********                          W            .
 12:22:00  .*************                       W            .
 12:23:00  .**********                          W            .
 12:24:00  .**************                      W            .
 12:25:00  .********************                W            .
 12:26:00  .********************************** W            .
           .----+----I----+----I----+----I----+----I----+----I
           0      1320      2640      3960      5280      6600 MAX AT 12:01:00
```

Each line shows the time the sample was taken. The X-axis scale value to be plotted is automatically adjusted to the next highest multiple of 50. If PLOTMAX is specified, values exceeding this limit are expressed with an asterisk extending beyond the right side of the graph.

->	Designates that this interval sample value and all interval sample values above this line are included in the CURR PD, shown in the Area 2 diagram.
MAX AT or MIN AT	The time the maximum or minimum sample value was measured.

Area 4 - Monitor Measurements

```
For count services:      |   For average services:
                         |
 --- AVG/SEC ---         |   --- EVENTS ---
     57.21               |       13,817
     74.99               |        1,706
     42.62               |        1,520
                         |
     19.17               |          163
     15.78               |          181
     91.15               |          140
    109.57               |          132
     22.97               |          158
     29.08               |          119
     21.55               |          129
     30.32               |          132
     45.33               |          196
     75.97               |          165
```

This area is displayed for count-type or average-type services only. For services that measure a count, the rates per second are shown for the displayed time intervals. These values are calculated by dividing the number of event occurrences by the elapsed time. For services that measure an average, the event counts used to calculate the averages, such as the number of transactions for which response time was measured, are shown.

Area 5 - Range Limits and Distribution

```
RANGE:      0->1220  1221->2440  2441->3660  3661->4880  4881->6758 ---TOTAL---
DISTR:      2    7%     8   29%     7   25%     4   14%     7   25%    28  100%
```

This area is displayed only if the RANGES keyword is specified with the SET timer request for the service. Otherwise, only the maximum or minimum value ever measured is shown as MAX or MIN value.

RANGE: The user-defined range limits. Four upper-range limits can be defined with the RANGES keyword of the SET request. The first low range is set to zero. Each successive lower-range limit is equal to the preceding upper-range limit +1.

The fifth upper-range limit is the sample value that exceeded the maximum range limit specified by the RANGES keyword of the SET request. It is always the maximum observed sample value. If no sample value exceeds the maximum specified range limit, the maximum value encountered is displayed.

DISTR: The number and relative percentage of sample values falling into each range.

Active Monitor Summary Display (DMON)

The DMON service shows the current status of all active monitors. If you have a color monitor, the graph will be displayed in the following colors:

Red	Warning status
Turquoise	Normal values for the current interval
Yellow	Maximum threshold: Values for the current period are greater than the values for the previous period
	Minimum threshold: Values for the current period are less than the values for the previous period

```
BOOLE AND BABBAGE----------    MONITOR SUMMARY      -----------PERFORMANCE MGMT
SERV ==> DMON            INPUT    09:44:26  INTVL=> 5  LOG=> Y  TGT==> DB2A
PARM ==> 46             IM1714I CURRENT DISPLAY POSITION =  31.  SCROLL=> CSR
EXPAND:  LINESEL(PLOT)
---------------------------------- STATISTICS---------------------------------
STATUS  - ACTIVE        09:16:38 BBI-SS STARTED
MONITOR STATUS:  90 ACTIVE     0 COMPLETE     0 QUIESCED   15 CURRENT WARNINGS
------------------------------MONITOR STATISTICS------------------------------
REQUEST                  --PARM-- CURRENT WVAL |-8-6-4-2-0+2+4+6+8+0|INTVL WARN
FAILED AUTO BINDS                      0    NZ |         W          |   1M
SQL ACTIVITY                         752   400 |*********W********* |   1M   3M
SQL ACTIVITY             DDL           0    20 |         W          |   1M
SQL ACTIVITY             AUTH          0     5 |         W          |   1M
SQL ACTIVITY             SEL         379   100 |*********W**********|   1M   4M
SQL ACTIVITY             LOCK          0     2 |         W          |   1M
SQL ACTIVITY             UID         379   200 |*********W********* |   1M   3M
SQL ACTIVITY             DYN           0     2 |         W          |   1M
SQL ACTIVITY             CTL           0     4 |         W          |   1M
USERS SUSPENDED FOR LOCK               0    NZ |         W          |  20S
TABLESPACE LOCK COUNT                  3    NZ |>>>>>>>>>W>>>>>>>>>>|  20S   3M
INDEX SPACE LOCK COUNT                 0    NZ |         W          |  20S
PAGE LOCK COUNT                      253    NZ |>>>>>>>>>W>>>>>>>>>>|  20S   3M
MAX PAGE LOCKS                       253    NZ |>>>>>>>>>W>>>>>>>>>>|  20S   3M
GETPAGES PER READ I/O                 10   <30 |*********W******    |   1M   3M
```

Figure 6. DMON Sample Display

Select Code: DMON

Parameter: Specifies the monitor requests to be displayed. The status of 15 requests are displayed. They can be selected by

- Entering the relative request number (1 to 3 digits); the default is 1. DMON displays 15 monitor requests beginning with the selected request. Press ENTER to see the remaining currently-defined monitor requests in groups of 15.
- Entering a valid reqid (see “Service Request ID (reqid)” on page 76). DMON displays 15 monitor requests beginning with the specified request. Press ENTER to see the remaining currently-defined monitor requests in groups of 15.
- Entering a 0. DMON displays only the first 15 monitor requests. The parameter remains at 0 until either a relative number or reqid is entered.

Description: Displays status data for all the active monitor requests. It shows each request, the current sampling, the defined threshold, and a graphic summary of all the current measured values compared to defined thresholds.

There is a one-line display for each request. Each line shows the

- Full request title (REQUEST).
- Request parameter (PARM).
- Latest measured value (CURRENT).
- Warning threshold (WVAL).
- Plot for the current sampling and a warning threshold (W marker) if the WVAL keyword was specified with the SET request.
- Sampling interval (INTVL).
- Duration of the current warning condition (WARN).

A -100 to +100 warning threshold percentage can be plotted. The plot characters indicate a trend as follows:

< Shows a downward trend from the preceding sampled values.

> Shows an upward trend from the preceding sampled values.

* Shows no change from the preceding sampled values.

Previous period to current period (see the “Area 2” description in “Monitor History Display (PLOT)” on page 95) comparison determines the trend direction.

Expand: The DMON display can be EXPANDed to the following displays:

LINESEL(PLOT)
PLOT for a specific monitor can be selected by positioning the cursor in one of the scrollable lines and pressing ENTER.

Active Monitor Warning Display (DWARN)

The DWARN service shows only those active monitors currently in a warning condition. If you have a color monitor, the graph will be displayed in the following colors:

Red	Warning status
Turquoise	Normal values for the current interval
Yellow	Maximum threshold: Values for the current period are greater than the values for the previous period
	Minimum threshold: Values for the current period are less than the values for the previous period

```
BOOLE AND BABBAGE----------    WARNING SUMMARY      -----------PERFORMANCE MGMT
SERV ==> DWARN           INPUT    09:42:28  INTVL=> 5  LOG=> Y  TGT==> DB2A
PARM ==> 46             IM1714I CURRENT DISPLAY POSITION =  31.  SCROLL=> CSR
EXPAND:  LINESEL(PLOT)
--------------------------------- STATISTICS---------------------------------
STATUS  - ACTIVE        09:16:38 BBI-SS STARTED
MONITOR STATUS:  90 ACTIVE     0 COMPLETE     0 QUIESCED   18 CURRENT WARNINGS
--------------------------CURRENT WARNING CONDITIONS--------------------------
      REQUEST                  --PARM-- CURRENT WVAL     0+2+4+6+8+0|INTVL WARN
SQLAC SQL ACTIVITY                         563   400     W****      |   1M   1M
SQLAC SQL ACTIVITY             SEL         287   100     W**********|   1M   2M
SQLAC SQL ACTIVITY             UID         287   200     W****      |   1M   1M
TSLOK TABLESPACE LOCK COUNT                  3    NZ     W>>>>>>>>>>|  20S   3M
PGLOK PAGE LOCK COUNT                       98    NZ     W>>>>>>>>>>|  20S   2M
MXLOK MAX PAGE LOCKS                        98    NZ     W>>>>>>>>>>|  20S   2M
GETPG GETPAGE REQUESTS                      72    20     W**********|   1M   3M
GETPG GETPAGE REQUESTS         BP2          72    NZ     W**********|   1M   3M
RIO   RIO-READ I/O                          72    15     W**********|   1M   2M
SWS   SWS-SYSTEM PAGE UPDATES              289    10     W**********|   1M   2M
WIO   WIO-WRITE I/O                         26     5     W**********|   1M   2M
PWS   PWS-SYSTEM PAGES WRITTEN              81     5     W**********|   1M   2M
LOGWR LOG WRITE REQUESTS                   604    40     W**********|   1M   2M
LOGWR LOG WRITE REQUESTS       NOWAIT      604    37     W**********|   1M   2M
GETPAGES PER READ I/O                       10   <30     W******    |   1M   2M
```

Figure 7. DWARN Sample Display

Select Code: DWARN

Parameter: Specifies the warning monitor requests to be displayed. The status of 15 requests in a warning condition are displayed. They can be selected by

- Entering the relative request number (1 to 3 digits); the default is 1. DWARN displays 15 warning monitor requests beginning with the selected request. Press ENTER to see the remaining currently-defined warning monitor requests in groups of 15.
- Entering a valid reqid (see “Service Request ID (reqid)” on page 76). DWARN displays 15 warning monitor requests beginning with the specified request. Press ENTER to see the remaining currently-defined warning monitor requests in groups of 15.
- Entering a 0. DWARN displays only the first 15 warning monitor requests. The parameter remains at 0 until either a relative number or reqid is entered.

Description: DWARN shows each active warning request, the current sampling, the defined threshold, and a graphic summary of the measured values that exceeded defined thresholds.

There is a one-line display for each request. Each line shows the

- Full request title (REQUEST).
- Request parameter (PARM).
- Latest measured value (CURRENT).
- Warning threshold (WVAL).
- Plot for the current sampling and a warning threshold (W marker).
- Sampling interval (INTVL).
- Duration of the current warning condition (WARN).

A -100 to +100 warning threshold percentage can be plotted. The plot characters indicate a trend as follows:

< Shows a downward trend from the preceding sampled values.

> Shows an upward trend from the preceding sampled values.

* Shows no change from the preceding sampled values.

Previous period to current period (see the “Area 2” description in “Monitor History Display (PLOT)” on page 95) comparison determines the trend direction.

Expand: The DWARN display can be EXPANDed to the following displays:

LINESEL(PLOT)
PLOT for a specific monitor can be selected by positioning the cursor in one of the scrollable lines and pressing ENTER.

Service Utility Commands

The utility commands are for system programmer use. They are used to control and maintain service availability. These commands are distributed with a special security code of Z.

Lock a Service (LOCK)

LOCK can be used to remove a service from general availability. It prevents the use of a specific service until a corresponding ULOCK request is issued. LOCK can be entered in the SERV field of the Service Input Panel or as a line command (L) from the service list applications.

Unlock a Service (ULOCK)

A service may become locked if

- The service abended.
- The service was the target of a LOCK service.
- The service routine could not be loaded.

When the condition is corrected, ULOCK can be used to unlock the service. ULOCK can be entered in the SERV field of the Service Input Panel, specifying the service name in the `PARM` field or as a line command (U) from the service list applications.

Test a Service (TEST)

TEST is for BMC Software use.

Display Timer Facility Statistics (Option 8)

The timer facility controls all requests for timer-driven services, which include

- Data collection by the monitor and application trace services
- Image logging of the analyzer or monitor service displays

Selecting Option 8 from the MAINVIEW for DB2 Primary Option Menu displays general information about the Timer facility, as shown by Figure 8.

```
BOOLE AND BABBAGE ------ DISPLAY STATISTICS AND DEFAULTS ----- PERFORMANCE MGMT
COMMAND ===>                                                  TGT ===> DB2A
                                                              TIME --  15:23:04

BBI-SSID: FV1X   BBI Release level -- 2.6.0      SS Started: 15:14:01 19-MAY-00
                                                 SS Elapsed: 00:09:02

   Requests:           30 Total request blocks        15 Unused blocks
   Activity:           49 Service calls                0 Warnings written

   Parameters:  ---- General ----                           - TRACE BUFFERS -
                INTERVAL=00:01:00                           STORAGE=100K
                ROUT=NONE                                   TRBUFF=5
                DESC=NONE                                   TRSIZE=40K
                                                            TRLIM=200K
------------------------ DEFINED REQUESTS BY TARGET --------------------------
LC  TARGET   TYPE     ACTIVE  INIT  COMPLETE  HELD  INVALID  LOCKED   QIS   RST
    -TOTAL-- --ALL--      15
    DB2A     MONITOR       4
    DB2A     IMG-LOG       3
    DB2C     IMG-LOG       4
    DB2C     MONITOR       4
     *************************** END OF REQUESTS ****************************
```

Figure 8. Sample Timer Facility Display

This application shows the BBI-SS PAS status, timer facility activity statistics, and timer request default parameters in effect and summarizes the status of all the timer requests. The information shown is for the BBI-SS PAS connected to the target specified in the TGT field of the display.

The panel components are

BBI-SS PAS Status Information
Timer Facility Activity Statistics
Timer Request Default Parameters
Defined Timer Requests by Target

The panel fields are shown and described by panel component in the sections that follow.

BBI-SS PAS Status Information

This area displays BBI-SS PAS status information.

```
BBI-SSID: FV1X   BBI Release level -- 2.6.0    SS Started:  15:14:01 19-MAY-00
                                               SS Elapsed:  00:09:02
```

Figure 9. BBI-SS PAS Status

These fields show the status of the BBI-SS PAS by

Field	Description
BBI-SS PASID	A two- to four-character code that identifies the active SS (subsystem).
BBI Release Level	The installed release level of the BBI components.
SS Started	The date and time the BBI-SS PAS was started.
SS Elapsed	The number of hours the BBI-SS PAS has been active.

Timer Facility Activity Statistics

This area displays timer facility activity statistics.

```
Requests:       30 Total request blocks        15 Unused blocks
Activity:       49 Service calls                0 Warnings written
```

Figure 10. Timer Facility Activity

These fields show the timer facility activity by

Field	Description
Requests	Total Request Blocks The maximum number of timer requests that can be defined concurrently. Unused Blocks The number of blocks that are still available for new timer requests.
Activity	Service Calls The number of times the timer facility has invoked a service. This includes requests for data collection monitors and automatic image logging of analyzer or monitor displays. Warnings Written The number of initial warning condition messages issued by the requested data collection monitors.

Active Default Parameters

This area displays active default parameters.

```
Parameters:  ---- General ----                          - TRACE BUFFERS -
             INTERVAL=00:01:00                          STORAGE=100K
             ROUT=NONE                                  TRBUFF=5
             DESC=NONE                                  TRSIZE=40K
                                                        TRLIM=200K
```

Figure 11. Active Default Parameters

These fields show the timer facility default parameters in effect (the defaults are defined in the BBIISP00 member of the BBPARM data set) by

Field	Description
INTERVAL	The default timer request interval. This value is used if the INTERVAL keyword is not specified when a timer request is defined.

The IBM manual, *MVS/ESA Application Development Macro Reference Codes*, explains the following codes:

ROUT	The MVS console route code(s) for monitor warning WTO messages. NONE is the default.
DESC	The descriptor code(s) for monitor warning WTO messages. NONE is the default.

For further information about the fields defined below, see “Detail Trace Online Data Storage” in Volume 2.

STORAGE	The amount of extended BBI-SS PAS private area storage allocated for the trace entry buffer.
TRBUFF	The number of trace buffers allocated for each active detail trace.
TRSIZE	The size of each trace buffer.
TRLIM	The upper limit on the total storage that can be allocated for any one trace.

Defined Requests by Target

This area displays defined requests by target.

```
------------------------ DEFINED REQUESTS BY TARGET --------------------------
LC  TARGET   TYPE     ACTIVE  INIT  COMPLETE  HELD  INVALID  LOCKED   QIS   RST
    -TOTAL-- --ALL--      15
    DB2A     MONITOR       4
    DB2A     IMG-LOG       3
    DB2C     IMG-LOG       4
    DB2C     MONITOR       4
     *************************** END OF REQUESTS ****************************
```

Figure 12. Request Summary by Target

This portion of the Timer Statistics panel is a scrollable list of all the requests per target for the BBI-SS PAS shown in the BBI-SS PASID field (see "BBI-SS PAS Status Information" on page 107). It shows the request type for each target and the amount of activity for each request state by

Field	Description
LC	A line command input field. A one-character line command (see "Line Commands" on page 111) can be entered in this field to select a list display of the active timer requests, as described in "Active Timer Requests (S Line Command)" on page 112.
TARGET	A one- to four-character identification code of a DB2 subsystem.
TYPE	The types of timer requests are MONITOR — Monitor service requests. IMG-LOG — Automatic image logging requests of analyzer or monitor displays.

The total number of requests per target is shown for each of the following request states:

ACTIVE	Active requests.
INIT	Requests waiting to be invoked (a start time was specified, but it has not been reached).
COMPLETE	Requests that completed normal execution.
HELD	Requests being held and pending release.
INVALID	Requests that terminated because of an invalid parameter or measurement. The BBI-SS PAS Journal log contains descriptive messages of the request errors.
LOCKED	Requests that terminated because of a LOCK command or a service routine ABEND.
QIS	Requests that quiesced because the target DB2 subsystem was not active.

RST	The target DB2 subsystem restarted, and these are the number of requests waiting until the current interval expires before performing restart processing as specified by the RST keyword in the original request.

Line Commands

Entering the following line command in the LC field of the Timer Facility application executes the line command function:

Line Command	Description
S	SELECT. Selects the Active Timer Requests application showing • All the BBI-SS PAS requests (see "Active Timer Requests List" on page 112). S is entered in the LC field for the TOTAL targets (see Figure 12 on page 110). • Only those requests for a specific target. S is entered in the LC field for the target identifier (see Figure 12 on page 110).

Active Timer Requests (S Line Command)

The S line command displays the Active Timer Request application, described in Chapter 18, “Active Timer Requests (Option 3)” on page 347. The list shown in Figure 13 is displayed when the S line command is entered in the LC input field for TOTAL. It displays all the timer requests active for the target shown in the TGT field.

```
BOOLE AND BABBAGE  --------- ACTIVE TIMER REQUESTS ----------  PERFORMANCE MGMT
COMMAND ===>                                                  TGT ===> DB2A
                                   INPUT    INTVL ==> 3      TIME --  10:52:10
COMMANDS: SM (START MONITORS), SORT, AREA, X ON|OFF, DM (DMON), DW (DWARN)
LC CMDS: S (SELECT), W (SHOW),      M(MODIFY),
         P (PURGE),  R (REPLICATE), H (HELP), Z (STOP)                     >>>
LC   SERV  PARM     TITLE                   CURRENT  WVAL |-8-6-4-2-0+2+4+6+8+|
     SOSCN          SOS CONTRACTIONS              0    NZ |         W         |
     DSOPN          DB DATA SETS OPEN            38    60 |>>>>>    W         |
     DSOPR          DB DATASET OPEN REQUESTS      0     3 |         W         |
     DSOPR BP0      DB DATASET OPEN REQUESTS      0     3 |         W         |
     DSOPR BP1      DB DATASET OPEN REQUESTS      0    NZ |         W         |
     DSOPR BP2      DB DATASET OPEN REQUESTS      0    NZ |         W         |
     DSUTL          OPEN DB DATASET % UTIL        3    20 |*        W         |
     CONUT TSO      CONNECTION % UTILIZATION     10    40 |<<       W         |
     CONUT BATCH    CONNECTION % UTILIZATION     10    60 |*        W         |
     THDUT          THREAD % UTILIZATION          0    30 |         W         |
     THDAC IMS      ACTIVE THREADS                0    NZ |         W         |
     THDAC BATCH    ACTIVE THREADS                0    NZ |         W         |
     THDAC CAF      ACTIVE THREADS                0     5 |         W         |
     THDQD          QUEUED THREADS                1    NZ |*********W*********|
     THDID          IN DOUBT THREADS              0    NZ |         W         |
     EDMLD          AVG EDM REQUESTS/LOAD         0   140 |         W         |
     EDMLD CT       AVG EDM REQUESTS/LOAD         0   140 |         W         |
     EDMLD DBD      AVG EDM REQUESTS/LOAD         0   140 |         W         |
     BPUTL          BFR POOL % UTILIZATION        6    30 |*        W         |
     BPUSE          BFR POOL % IN USE             0    30 |         W         |
     RWP            READS WITH PAGING             0    NZ |         W         |
     WWP            WRITES WITH PAGING            0    NZ |         W         |
     GETPG          GETPAGE REQUESTS            144    20 |*********W*********|
     GETPG BP0      GETPAGE REQUESTS            144    20 |*********W*********|
     GETPG BP1      GETPAGE REQUESTS              0    20 |         W         |
     GETPG BP2      GETPAGE REQUESTS              0    20 |         W         |
     GETRI          GETPAGES PER READ I/O        10   <30 |*********W******   |
```

Figure 13. Active Timer Requests List

Part 3. Analyzers (Current Status/Activity Displays)

This part describes each of the analyzer services.

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Chapter 7. Introduction

The analyzer component is an analysis tool that provides many full-screen displays presenting a snapshot of DB2 status and activity data. Its services can be used to

- Select specific DB2 activities and resources for analysis.
- View the results of a service analysis to detect and diagnose DB2 performance problems.

Each of these service displays is described in this section as follows:

- The service display panel
- Valid parameters
- Definitions for each field in the service display panel

Note: Unless otherwise specified, all activity counts in the DB2 analyzer displays are values accumulated since the last DB2 restart.

Alphabetical List of Analyzer Services

Table 17 lists the DB2 analyzer display services alphabetically.

Table 17. Alphabetical List of DB2 Analyzer Services

Service	Title	Page
BFRPL	BUFFER POOL STATUS	290
CICSC	CICS DB2 CONNECTIONS	212
CICSE	CICS DB2 RCT ENTRY	229
CICSR	CICS DB2 RCT SUMMARY	215
CICST	CICS DB2 RCT TXIDS	244
CLAIM	CLAIM/DRAIN BY TS	268
DBIOB	I/O ANALYSIS — BPOOL (RT)	291
DBIOD	I/O ANALYSIS — DATASET (RT)	291
DBIOR	I/O ANALYSIS — DB/TS (RT)	291
DBIOV	I/O ANALYSIS — VOLUME (RT)	291
DBTS	DB/TS STATUS	143
DB2EX	DB2 EXCEPTIONS	141
DB2ST	DB2 SYSTEM STATUS	129
DDFDT	DDF STATISTICS DETAIL	310
DDFCV	DDF CONVERSATIONS	317
DDFSM	DDF STATISTICS SUMMARY	306
DDFVT	DDF VTAM STATUS	314
DLOGS	DB2 LOG STATUS	295
DUSER	DETAIL USER STATUS	160
EDMPL	EDM POOL STATUS	277
LKOUT	LOCKOUT HISTORY	275
LOCKD	LOCK CONTENTION BY DB/TS	249
LOCKE	LOCK CONT USER DETAIL	261
LOCKU	LOCK CONTENTION BY USER	258
RIDPL	RID POOL STATUS	292
USERS	USER SUMMARY	153
ZPARM	DB2 SYSTEM PARAMETERS	151

Analyzer Services by Area

Table 18 lists the DB2 analyzer display services grouped by area.

Table 18. DB2 Analyzer Services by Area

Service	Title	Page	Area
DB2ST DB2EX DBTS ZPARM	DB2 SYSTEM STATUS DB2 EXCEPTIONS DB/TS STATUS DB2 SYSTEM PARAMETERS	129 141 143 151	General DB2 System
USERS DUSER CICSC CICSR CICSE	USER SUMMARY DETAIL USER STATUS CICS DB2 CONNECTIONS CICS DB2 RCT SUMMARY CICS DB2 RCT ENTRY	153 160 212 215 229	User Activity
LOCKD LOCKU LOCKE LKOUT CLAIM	LOCK CONTENTION BY DB/TS LOCK CONTENTION BY USER LOCK CONT USER DETAIL LOCKOUT HISTORY CLAIM/DRAIN BY TS	249 258 261 275 268	Locks
EDMPL	EDM POOL STATUS	277	EDM Pool
BFRPL DBIOR DBIOB DBIOV DBIOD RIDPL	BUFFER POOL STATUS I/O ANALYSIS — DB/TS (RT) I/O ANALYSIS — BPOOL (RT) I/O ANALYSIS — VOLUME (RT) I/O ANALYSIS — DATASET (RT) RID POOL STATUS	290 291 291 291 291 292	Buffer Pools
DLOGS	DB2 LOG STATUS	295	Logs
DDFSM DDFDT DDFVT DDFCV	DDF STATISTICS SUMMARY DDF STATISTICS DETAIL DDF VTAM STATUS DDF CONVERSATIONS	306 310 314 317	DDF

Chapter 8. List Analyzer Services (Option 2)

This application is a scrollable list of all the resource analyzer services that you are authorized to view.

With this application you can issue requests to

- Access the analyzer displays easily
- Print a screen image automatically to the online BBI-SS PAS Image log or to the TS Image log or your BBISPRNT data set

```
BOOLE AND BABBAGE -------- ANALYZER DISPLAY SERVICES --------- PERFORMANCE MGMT
COMMAND ===>                                                 TGT ===> DB2G

COMMANDS: SORT, AREA
LC CMDS: S(SELECT), I(IMAGE LOGGING), H(HELP)
LC   SERV   PARAMETER   TITLE                      PARM TYPE    SEC  AREA   STAT
     DB2ST              DB2 SYSTEM STATUS          (DELTA/RATE)  A   DSYS
     DB2EX              DB2 EXCEPTIONS             (LEVEL)       A   DSYS
     DBTS               OPEN DB/TS STATUS          (SUBSET/FIND) A   DSYS
     ZPARM              DB2 SYSTEM PARAMETERS                    A   DSYS
     USERS              USER SUMMARY               (ATTACH-MODE) A   USER
     DUSER              DETAIL USER STATUS          USERID       A   USER
     CICSC              CICS DB2 CONNECTIONS                     A   USER
     CICSR              CICS DB2 RCT SUMMARY        CICS         A   USER
     CICSE              CICS DB2 RCT ENTRY          CICS         A   USER
     LOCKD              LOCK CONTENTION BY DB/TS   (SUBSET/FIND) A   LOCK
     LOCKU              LOCK CONTENTION BY USER    (USERID)      A   LOCK
     LOCKE              LOCK CONT USER DETAIL      (USERID)      A   LOCK
     LKOUT              LOCKOUT HISTORY                          A   LOCK
     EDMPL              EDM POOL STATUS            (DELTA/RATE)  A   EDM
     BFRPL              BUFFER POOL STATUS         (POOLID)      A   BUFR
     RIDPL              RID POOL STATUS            (DELTA/RATE)  A   BUFR
     CLAIM              CLAIM/DRAIN BY TS          (SUBSET/FIND) A   LOCK
     DLOGS              DB2 LOG STATUS             (DELTA/RATE)  A   LOG
     DDFSM              DDF STATISTICS SUMMARY     (DELTA/RATE)  A   DDF
     DDFDT              DDF STATISTICS DETAIL       LOCATION     A   DDF
     DDFVT              DDF VTAM STATUS                          A   DDF
     DDFCV              DDF CONVERSATIONS          (LUNAME)      A   DDF
     DBIOR              I/O Analysis-DB/TS         (KEYWORDS)    A   WKLD
     DBIOB              I/O Analysis-Bpool         (KEYWORDS)    A   WKLD
     DBIOV              I/O Analysis-Volume        (KEYWORDS)    A   WKLD
     DBIOD              I/O Analysis-Dataset       (KEYWORDS)    A   WKLD
                         *** END OF SERVICES ***
```

Figure 14. List Analyzer Display Services Application

This application allows service selection by line command and shows the allowable parameters for each service, the service security classification, the area of DB2 being analyzed, and the service status by

Field Name	Description
LC	A line command input field. One-character line commands can be entered in this field to execute a service and display the output, display a data entry panel to define and submit a SET timer request for BBI-SS PAS Image logging, or display HELP information for the selected service (see "Line Commands" on page 122).
SERV	A scrollable list of all the analyzer services by service select code.
PARAMETER	An input parameter field (see the table in "Analyzer Services" on page 37 for a list of the services and allowable parameters).
TITLE	The service title.
PARM TYPE	A short description of the parameters that can be used, if the service allows parameters. Optional parameters are shown in parentheses.
SEC	The security code for user access to the service.
AREA	The DB2 resource area being analyzed. This field could contain

Field Data	Description
DSYS	General DB2 system
USER	User activity
LOCK	Resource or user locks
EDM	Environmental Descriptor Manager pool
BUFR	DB2 buffer pools
LOG	DB2 logs
DDF	Distributed Data Facility

STAT	The service status (LOCK, TEST, or blank).

Primary Commands

The following commands can be entered on the COMMAND line of the Analyzer Display Service list application:

SORT
AREA

SORT

When the list of analyzer display services is displayed initially, the list is sorted by an internally defined sequence. SORT can be used to sort the list by any of the following column headings. The first two characters of the column heading are used with SORT as follows:

```
SORT cc
```

where cc can be any of the following two characters:

SE	Sorts the list alphabetically by service name (SERV column).
TI	Sorts the list alphabetically by service title (TITLE column).
SC	Sorts the list alphabetically by security code (SEC column).
AR	Sorts the list alphabetically by the resource area (AREA column) as organized in Part 3, “Analyzers (Current Status/Activity Displays)” on page 113 and by service name within the area.
ST	Sorts the list alphabetically by the service status displayed (STATUS column).

SORT with no parameters sorts the columns by the internally defined sequence.

AREA Primary Command

You can use the AREA command to list only the services related to a specified area. The possible areas that can be specified are listed in the AREA column. For example, to list only the DB2 user activity services, type on the COMMAND line:

```
AREA USER
```

Type AREA to return to the list of all the services.

Line Commands

Entering one of the following one-character line commands in the LC field for a service executes the line command function. Multiple line commands can be entered at one time and are processed in sequence. Each display in a series is shown by pressing the END key. Each Image log request in a series is submitted by pressing the ENTER key then the END key to process the next request.

Line Command	Description
S	SELECT. Selects a resource analyzer service for execution. Selecting an analyzer displays the output of the service analysis in the service display panel. Additional service requests can be made in the following input fields of the service display panel.

Input Fields	Description
SERV	The service select code of the selected analyzer is shown in this field. Any of the analyzer service select codes can be entered in this field. Entering a valid service select code requests the specified service and shows the results of its analysis in the display panel's output data lines (see the "Output Fields" description below). Pressing the END key redisplays the Analyzer Display Services list.
PARM	An optional parameter (maximum of 55 characters).
INTVL	The screen refresh interval (3 second default).
LOG	Writes the screen image to the Terminal Session Image log (Y|N).
TGT	The target DB2 subsystem ID.
SCROLL	The scroll amount for lists of data, which can be either from the cursor position (CSR), a specified number of lines, half a page (H), a page (P), or the maximum list elements (M). The scroll direction is determined by the use of the UP (PF7/19) or DOWN (PF8/20) key.

The output fields of the service display panel provide the following information:

Output Fields	Description
INPUT	INPUT indicates the screen is in input mode.
RUNNING	RUNNING indicates the screen is in refresh mode. The GO key (PF6/18) changes input mode to refresh mode. Pressing the ATTN key (SNA terminals) or the PA1 key (non-SNA terminals) changes refresh mode to input mode. The *Using MAINVIEW* manual describes how to use screen refresh.
hh:mm:ss	Timestamp.
Service Title	The service description.
data lines	The service analysis output. List data can be scrolled when it fills the screen.

Pressing the END key (PF3/15) redisplays the Analyzer Display Services list.

I — IMAGE LOGGING. Displays the data entry timer request panel to specify when the service is to be invoked and the output is to be automatically recorded in the BBI-SS PAS Image Log (see "Start Image Log Request (I Line Command)" on page 124). A display is logged at the end of each interval.

H — HELP. Displays HELP information for this service. This shows the service title, gives a short description, and defines any parameters.

The following commands are for system programmer use and are restricted by a security access code:

L — LOCK. Locks this service. The service cannot be used again until it is unlocked.

U — ULOCK. Unlocks this service, which could be locked by the use of the LOCK command or a service ABEND.

T — TEST. BMC Software use only.

Start Image Log Request (I Line Command)

This panel shows the options that can be specified to automatically invoke the selected analyzer service and log the output to the BBI-SS PAS Image log. The input fields are prefixed with a highlighted ===> symbol. Any default values for a field are displayed.

```
BOOLE AND BABBAGE  ------- START IMAGE LOGGING REQUEST ----  REQUEST ACCEPTED
COMMAND ===>                                                  TGT ===> DB2A

                       DUSER - USER DETAIL STATUS

PARM      ===> CIR8                          (USERID)

INTERVAL  ===> 00:01:00 START ===>           STOP ===>            QIS ===>

RST       ===>                               (Restart Option: HOT,COLD,PUR,QIS)
```

Figure 15. Image Log Request Application

Each request must be unique and is defined by the service select code and an optional parameter (reqid). The parameter is required if the same service is requested more than once. The service field is preset with the code of the selected service. All keyword options are described in “The SET Timer Request” on page 75.

The request is submitted when the ENTER key is pressed. A short message in the upper-right corner of the display shows the result of the request. If an ERROR IN REQUEST message is displayed, a short explanatory message is displayed on the third line. Pressing the END key (PF3/15) redisplays the Analyzer Display Services list.

Chapter 9. Using Analyzers

You can issue requests to

- Access the analyzer displays easily through ISPF-like menus and scrollable lists
- Move quickly from summary displays to detail displays or to related services (EXPAND)
- View displays that are refreshed in a user-defined cycle
- Invoke an analyzer display from an AutoOPERATOR EXEC
- Invoke a new display by overtyping the SERV field on the Service Display panel
- Print a screen image automatically to the online BBI-SS PAS Image log or to the TS Image log or your BBISPRNT data set

These display request and logging methods are described in the following sections.

Selecting a Service(s) for Display

You can request an analyzer display by

- Selecting one or more services from an analyzer service list

  Use the S line command from the Analyzer Display Services list application to select a service (see Chapter 8, “List Analyzer Services (Option 2)” on page 119).

- EXPANDing from another display

  Tab to one of the EXPAND fields in an analyzer display and press ENTER to select

  – A related analyzer display

  – More detailed information about a data row in the display

  – Related monitors shown on the Active Timer list application

    From this list, you can use the S line command to view an historical plot display for the related monitor service.

  (See the *Using MAINVIEW* manual.)

- Setting up displays for timed, cyclic refresh

  Select Option C, CYCLE SETUP, from the Primary Option Menu to set up a continuous timed cycle of refreshable displays (see the *Using MAINVIEW* manual).

- Invoking an analyzer display from an AutoOPERATOR EXEC

  Write an EXEC that invokes a resource analyzer service (a BMC Software AutoOPERATOR product must be installed). Use the IMFEXEC IMFC command followed by the service name, optional parameters, and an identifier for the target DB2 system, as follows:

  ```
  IMFEXEC IMFC DB2ST TARGET=db2ssid
  ```

  The display data is returned in the predefined &LINE04 - &LINE43 variables to assist in making informed automation decisions.

- Invoking an analyzer display from another analyzer display

  When viewing any analyzer display, you can overtype the values in the SERV and PARM fields to select any other display directly.

Logging a Resource Analyzer Service Display

Service displays can be written to a data set for later viewing by

- Logging a screen image to your BBISPRNT data set

  Use the PF4/16 key after the display is presented.

- Logging a display image record to your TS Image log

  Enter a Y in the LOG field of the display before the display is requested.

- Logging a display image record automatically at timer-driven intervals to your BBI-SS PAS Image log

  Use the

  – I line command in the list of Analyzer Display Services as described in “Start Image Log Request (I Line Command)” on page 124

  – SET request as described in “Logging Analyzer and Monitor Displays” on page 68

BBSAMP member SLOGJCL can be used to create a hardcopy of BBISPRNT. BBSAMP member ILOGJCL can used to create a hardcopy of the Image log records.

Note: BBISPRNT and the TS Image log contain only screen images, while the BBI-SS PAS Image log records contain the complete data produced by the display request, even when the data has been produced by scrolling through multiple screens.

Stopping a Resource Analyzer Image Log Request

BBI-SS PAS timer-driven Image log requests can be stopped by

- Purging the request from the Active Timer list application

  Use the P line command from the Active Timer list (Option 2) as described in Chapter 18, “Active Timer Requests (Option 3)” on page 347.

- Using a SET request

  The SET parameters are described in “The SET Timer Request” on page 75.

  – Purge the request

    Issue a PRG request with SET from the Service Display panel (Option 4 (DB2ST) from the Primary Option Menu), BBPARM (see “Grouping Requests” on page 70), or an AutoOPERATOR EXEC IMFC command (an AutoOPERATOR product must be installed). For example:

    ```
    SET
    PRG=reqid|ALL
    ```

  – Stop the request automatically

    Use the STOP or STOPCNT parameter with the SET request from the original setup panel, the Service Display panel, or an AutoOPERATOR EXEC. For example:

    ```
    SET
    REQ=DB2ST,I=00:05:00,START=24:00:00,STOP=06:00:00
    ```

Chapter 10. General DB2 System Displays

This chapter describes the analyzer display services that provide overall status, exception, and current installation parameter information about a target DB2 system.

DB2ST—DB2 System Status

The DB2 System Status panel portrays the overall status and activity within DB2. If you have a color monitor, graphs will be displayed in the following colors:

Red	Warning status
Turquoise	Normal values for the current interval
Yellow	Highlights the Deferred Write threshold (see “Area 2” in this section for a description of this threshold).

Note: This display is scrollable.

```
BOOLE AND BABBAGE----------   DB2 SYSTEM STATUS     -------------  RX AVAILABLE
SERV ==> DB2ST           INPUT    10:10:32  INTVL=> 5  LOG=> N  TGT==> DB2HHH
PARM ==>                                    ROW      1 OF     30 SCROLL=> CSR
EXPAND:  DB2EX, DBTS, USERS, CICSC, LOCKU, LKOUT, MON(ALL), EDMPL, BFRPL, ZPARM
USERS   CONNECTED/MAX   THREADS/MAX   ACTV.DB2   Q’D THDS  SUSPENDED     CPU %
TSO             2/25          2             0          0          0      0.0%
BATCH           9/30          0             0          0          0      0.0%
-CAF            0             0             0          0          0      0.0%
-UTILITY        0             0             0          0          0      0.0%
IMS             0             0             0          0          0      0.0%
CICS            0             0             0          0          0      0.0%
STOR PROC       9             0             0          0          0      0.0%
DB-ACCESS       0/10          0             0          0          0      0.0%
RRSAF           1             1             0          0          0      0.0%
SYS THRDS     114             4             4          0          0      0.0%
*TOTAL*       135             7/220         4          0          0      0.0%

POOLS:  %   0 ...25...50...75..100      CPU:   %      0 ...25...50...75..100
     EDM    |                      |         SYSTEM   | *************        |
     BP4    | ***      D       S C |         DB2 USERS| ***                  |
     BP5    | *        D       S C |         DB2/IRLM | <                    |
     BP9    |          D       S C |             SPAS |                      |
     BP32K  | *******  D       S C |    RLF: INACTIVE           DDF: ACTIVE

LOCKING:   #SUSPENSIONS     18    #DEADLOCKS         5     TIMEOUTS      5
EXCEPTIONS: SEV/WARN   000/000    WARN/MON.          0/0
DATA SETS:  OPEN            37    OPEN HWM          37     IN-USE        1
PRLL:       MAXIMUM          0    TOTAL GROUPS       0     FALLBACK      0
ST PROCS:   CALLS            0    ABEND/REJECT       0/0   TIMEOUTS      0
GROUP BP:   READS            0    WRITES             0     FAILURES      0
PAGING:     DB2 MSTR       0.2    DB2 DBM1        20.9     IRLM          0.1
            DB2 DIST       0.6    TOTAL SYSTEM     0.0     CSA           0.0
            DB2 SPAS       0.0
DB2 START:  19MAY00 / 06:35:15    TRACES: ACCOUNT 2,7,8
                                          STATS   1,3,4,5
                                          MONITOR 1
****************************** END OF DISPLAY ******************************
```

Figure 16. DB2 System Status Panel

Select Code:

DB2ST

Parameter:

One of the following parameters can be specified for this service. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Notes:

- Parameter choice for this service affects only the LOCKING statistics presentation.
- Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

Displays information concerning key indicators that apply to the entire subsystem, such as active users, threads by type, DB2 CPU usage, locking, paging and buffer and Environmental Data Manager (EDM) pool activity and status. This information provides an overall view of DB2 system activity and shows problems within DB2 that can be diagnosed with MVDB2 facilities.

Exception conditions detected by the background Exception Sampler or active MVDB2 monitors are also shown.

This service is scrollable.

Service Message(s):

When either the DELTA or RATE parameter is used for this service, the following message is displayed in line 3:

```
INTERVAL (MIN) n1/n2
```

where

n1 Is the number of elapsed minutes.

n2 Is the length of the interval.

This message indicates the time elapsed within the current statistics interval. If interval times include fractions of a minute, these fractions are truncated on the display.

A message in the parameter field of the panel shows the sequence number of the first row of information displayed and the total number of rows that can be displayed in this scrollable service.

For example:

```
ROW 1 OF 20
```

Expand:

The DB2ST display can be EXPANDed to the following displays:

DB2EX	DB2 Exceptions display
DBTS	Database and Table Space Status display
USERS	User Summary display
CICSC	CICS DB2 Connections display
LOCKU	Lock Contention by User display
LKOUT	Lockout History display
MON(ALL)	Active Timer Requests display of all active monitors
EDMPL	EDM Pool Status display
BFRPL	Buffer Pool Status display (with a DELTA parameter)
ZPARM	DB2 System Parameters display

You also can tab to each section header and press ENTER to transfer to the following related displays:

Section	**Service/Parameter Transferred To**
USERS	USERS
TSO	USERS TSO
BATCH	USERS BATCH
CAF	USERS CAF
UTILITY	USERS UTILITY
IMS	USERS IMS
CICS	USERS CICS
DB-ACCESS	USERS DBAT
EDM	EDMPL
BPnn	BFRPL BPnn,DELTA
DDF	DDFSM
LOCKING	LOCKU
#DEADLOCKS	LKOUT
TIMEOUTS	LKOUT
EXCEPTIONS	DB2EX
WARN/MON.	Active Timer Requests application
DATA SETS	DBTS
GROUP BP	BFRPL
PAGING	MON(MVS)

Area 1 - Attach Status and Summaries

This area displays information for each active DB2 Attach mode and the totals for all the connected attach types.

```
USERS    CONNECTED/MAX   THREADS/MAX   ACTV.DB2   Q'D THDS  SUSPENDED     CPU %
TSO            2/25          2             0          0          0       0.0%
BATCH          9/30          0             0          0          0       0.0%
-CAF           0             0             0          0          0       0.0%
-UTILITY       0             0             0          0          0       0.0%
IMS            0             0             0          0          0       0.0%
CICS           0             0             0          0          0       0.0%
STOR PROC      9             0             0          0          0       0.0%
DB-ACCESS      0/10          0             0          0          0       0.0%
RRSAF          1             1             0          0          0       0.0%
SYS THRDS    114             4             4          0          0       0.0%
*TOTAL*      135             7/220         4          0          0       0.0%
                              INDOUBT=2
```

where

USERS

Defines all the active DB2 Attach modes, which include

- TSO
- BATCH
- CAF (Call Attach Facility, shown in DB2 with a connection name of DB2CALL)
- UTILITY
- IMS
- CICS
- STOR PROC (Stored Procedures)
- DB-ACCESS (Status of DBAT (Database Access Threads))
- RRSAF (DB2 Version 5 and later)
- SYSTEM THREADS (DB2 Version 5 and later)

The BATCH connection type shows all batch jobs that use QMF or the DSN command processor. In addition, it includes the batch connections that use CAF or are executing DB2 utilities, which are also shown on separate lines.

The CAF connections that support stored procedure calls and batch jobs executing under the TSO terminal monitor program (TMP) are of a special type that do not count towards the maximum concurrent batch connections. These connections are counted in separate categories.

System threads are shown as a separate category. These connections are used by DB2 for a variety of tasks, including threads used in support of CPU and I/O query parallelism.

CONNECTED

Number of users connected to DB2 by the corresponding attach modes. The BATCH count includes the CAF and UTILITY batch-type connections shown on separate lines.

The BBI-SS PAS establishes a CAF connection to each monitored DB2 subsystem to detect DB2 startup and shutdown. It is included in the CAF CONNECTED count.

Note: Users can be connected to DB2 without a thread or without being queued for a thread. If so, CONNECTED may not equal the sum of thread counts shown.

Example: An IMS message region connected to DB2 has a thread only when it is processing a transaction. Thus, an idle IMS message region contributes to the CONNECTED counts, but not to any of the THREADS, ACTV.DB2, Q'D THDS, or SUSPENDED counts. If there is an IMS with five message regions, three of which are currently processing SQL statements (assume one transaction is suspended waiting for an IRLM lock), the IMS attach status would be

```
USERS CONNECTED/MAX  THREADS/MAX  ACTV.DB2 Q'D  THDS  SUSPENDED   CPU %

IMS            6            3             2         0         1      6.4%
```

Note: IMS control regions are included in these counts.

MAX

For the TSO and BATCH attaches, this is the MAXIMUM number of allowed connections to DB2 as defined within the active DSNZPARM module. The field(s) are highlighted when the maximum connections are reached.

Note: BATCH connections include CAF and UTILITY counts.

THREADS

This column shows the number of active threads for the corresponding attaches.

Note: The sum of ACTV.DB2 and SUSPENDED usually does not equal THREADS because a user can also be active within the user's address space with a thread.

Example: An ISPF/TSO user, within SPUFI, retains a thread after the SQL query completes and the user is still within the ISPF SPUFI panels. Thus, a TSO user in such a state contributes a count to CONNECTED and to THREADS, but not to any of the ACTV.DB2, Q'D THDS, or SUSPENDED counts. If there are two TSO users using SPUFI, one in the state described above and the other currently processing an SQL statement, the TSO attach status would be

```
USERS  CONNECTED/MAX  THREADS/MAX  ACTV.DB2 Q'D  THDS  SUSPENDED   CPU %

TSO            2            2             1                   0      6.4%
```

MAX

This column shows the maximum number of total threads allowed, as defined within the active DSNZPARM module. The TOTAL fields are highlighted when the maximum threads are reached (CTHREAD).

ACTV.DB2

Number of active threads actually processing SQL statements.

Q’D THDS
: Number of connected DB2 users awaiting the completion of a CREATE THREAD request.

SUSPENDED
: Number of threads suspended because of locking contention.

CPU %
: Percentage of CPU activity for all users with a DB2 connection. This measures CPU usage for the user address spaces and includes processing in DB2 (in cross-memory mode) and in the user address spaces themselves.

  Percentage of CPU activity is measured by sampling the CPU consumed by target address spaces over a short period of time and dividing it by the amount of CPU consumable over this same period.

TOTAL
: Totals for the connected attach types (TSO, BATCH, IMS, CICS, DB-ACCESS), the active threads for each connection, the active DB2 threads, queued threads, suspended threads, and CPU activity percentage.

INDOUBT
: This field is the current number of indoubt threads. It is displayed only if indoubt threads exist.

  Indoubt conditions occur when a task fails between the end of Phase 1 commit processing and the beginning of Phase 2 commit processing. The unit of recovery is then said to be indoubt.

Area 2 - Pools

This portion of the screen displays DB2 EDM and buffer pool usage as a graph. Each asterisk symbol (*) represents 5% of the total scale. The buffer pools with the highest usage are displayed (up to a maximum of four).

```
POOLS:  %   0 ...25...50...75..100
     EDM    |                     |
     BP4    | ***      D       S C |
     BP5    | *        D       S C |
     BP9    |          D       S C |
     BP32K  | *******  D       S C |
```

The character indicators are used as follows:

D Deferred Write threshold.

You can specify this threshold with the DWQT parameter of the ALTER BUFFERPOOL command.

When this threshold is reached, asynchronous write is started for the data with the oldest updated pages. DB2 continues this until the percentage goes below the threshold.

S Sequential Prefetch threshold (90%).

Sequential prefetch is inhibited until buffer usage falls back below the threshold. This impacts systems that perform large and frequent scans.

The graph line is highlighted if this threshold is reached.

C Buffer Pool Critical threshold, which can be

- Data Management threshold, which is approximately 95% pool usage.
- Immediate Write threshold, which is approximately 97.5% pool usage.

When the immediate write threshold is reached, any update causes an immediate, synchronous write. This situation has a significant impact on performance and should be avoided when possible.

Area 3 - CPU

This area displays system resource usage as a graph. Each asterisk symbol (*) represents 5% of the total scale. When CPU is measured in a multi-processor complex, the CPU percentage is scaled such that the total of all CPU processors equals 100%.

```
CPU:   %      0 ...25...50...75..100
     SYSTEM   | *************        |
     DB2 USERS| ***                  |
     DB2/IRLM | <                    |
         SPAS |                      |
RLF: INACTIVE           DDF: ACTIVE
```

Resource usage is measured by

SYSTEM
: This bar represents the total system CPU usage.

DB2 USERS
: This bar represents the percentage of CPU taken by DB2 users of this DB2 subsystem in all attach modes. The DB2 users' attach modes include all IMS attaches, both message regions and control region, and all CICS regions currently attached to this DB2 subsystem.

DB2/IRLM
: This bar represents the percentage of CPU taken by the two address spaces (DB2 system services and database services) and the IRLM (IMS Resource Lock Manager) for this DB2 subsystem.

SPAS
: This bar represents the percentage of CPU taken by the Stored Procedures address space.

RLF
: User authorization ID and the RLF (Resource Limit Facility) table name in effect. INACTIVE indicates that there is no active RLF table.

DDF
: Status of DDF (Distributed Data Facility). It is either

  ACTIVE
  INACTIVE

Area 4 - Statistics/Status

This area of the display shows system-wide locking activity, paging activity, the current number of outstanding exceptions to normal DB2 operation, and the status of the current DB2 session.

Note: The DELTA or RATE parameter affects the counts in these lines:

- LOCKING
- PRLL
- ST PROCS
- GROUP BP

```
LOCKING:   #SUSPENSIONS     18    #DEADLOCKS         5     TIMEOUTS      5
EXCEPTIONS: SEV/WARN   000/000    WARN/MON.          0/0
DATA SETS:  OPEN            37    OPEN HWM          37     IN-USE        1
PRLL:       MAXIMUM          0    TOTAL GROUPS       0     FALLBACK      0
ST PROCS:   CALLS            0    ABEND/REJECT       0/0   TIMEOUTS      0
GROUP BP:   READS            0    WRITES             0     FAILURES      0
PAGING:     DB2 MSTR       0.2    DB2 DBM1        20.9     IRLM          0.1
            DB2 DIST       0.6    TOTAL SYSTEM     0.0     CSA           0.0
            DB2 SPAS       0.0
DB2 START:  19MAY00 / 06:35:15    TRACES: ACCOUNT 2,7,8
                                          STATS   1,3,4,5
                                          MONITOR 1
```

LOCKING:

This line shows system-wide locking activity. It indicates continuing lock activity by showing changing lock counts with the most significant digits from the lock activity counters. Presentation of the following fields depends on the service parameter chosen:

#SUSPENSIONS
Total number of thread suspensions because of locking contention.

#DEADLOCKS
Total number of deadlocks.

TIMEOUTS
Number of threads terminated with RESOURCE UNAVAILABLE errors.

EXCEPTIONS:

The following fields show the current number of outstanding exceptions to normal DB2 operation, as detected by the MVDB2 exception sampler, and the number of monitors in a warning status because a user-defined threshold was reached.

SEV/WARN
Number of current severe and warning exception conditions as detected by the exception sampler.

Current exceptions can be viewed with the DB2EX service (see “Background Exception Sampler” on page 341 for a more comprehensive explanation and a list of exceptions that can be detected).

The field is highlighted when the current severe exception count is nonzero.

WARN/MON.
Number of monitors currently in a warning condition, because the user-defined threshold was exceeded, and the total number of active monitors.

Current warnings can be viewed with the DWARN or DB2EX service (see Part 4, “Monitors (Early Warnings/Recent History)” on page 321 for a list of the available monitor services).

The field is highlighted when the current warning count is nonzero.

DATA SETS:

OPEN
Current number of open data sets.

OPEN HWM
Maximum number of data sets concurrently open since the time DB2 was last started. This represents the high water mark.

IN-USE
Number of open data sets currently being used.

PRLL:

This line shows statistics for queries that were processed in parallel:

MAXIMUM
Maximum degree of parallel processing executed among all parallel groups. This field indicates the extent to which queries were processed in parallel.

TOTAL GROUPS
Total number of parallel groups that executed at the planned parallel degree.

FALLBACK
Total number of times DB2 had to fall back to sequential processing. Possible reasons are

- A cursor that can be used for an update or delete
- A lack of ESA SORT support
- A storage shortage or contention on the buffer pool
- MVS/ESA enclave services unavailable
- Query parallelism disabled by the resource limit facility (RLF) for at least one dynamic select statement within a thread
- Parallel groups executed on a single DB2 (no sysplex) (DB2 Version 5 and later only)
- Parallel groups executed on a single DB2 member due to repeatable-read or read-stability isolation (no sysplex) (DB2 Version 5 and later only)
- Parallelism coordinator had to bypass a DB2 when distributing tasks because there was not enough buffer pool storage on one or more DB2 members (DB2 Version 5 and later only)

ST PROCS:

The following fields provide an overview of Stored Procedures activity:

CALLS
Number of SQL CALL statements to a Stored Procedure that were executed.

ABEND/REJECT
Number of times a Stored Procedure terminated abnormally and the number of times an SQL CALL statement was rejected because the procedure was in the 'STOP ACTION(REJECT)' state.

TIMEOUTS
Number of times an SQL CALL statement to a Stored Procedure timed out while waiting to be scheduled.

GROUP BP:

The following fields provide an overview of group buffer pool statistics:

READS
Total synchronous and asynchronous reads from the Coupling Facility for all group buffer pools.

WRITES
Total synchronous and asynchronous writes to the Coupling Facility for all group buffer pools.

FAILURES
Total failures of reads and writes to the Coupling Facility for all group buffer pools.

PAGING:

The following fields provide an overview of DB2 address space and system paging activity:

DB2 MSTR
Paging rate for the DB2 MSTR address space, expressed in pages per second.

This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

DB2 DBM1
Paging rate for the DB2 DBM1 address space, expressed in pages per second.

This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

IRLM
Paging rate for the IRLM address space, expressed in pages per second.

This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

DB2 DIST
: Paging rate for the DB2 DDF address space, expressed in pages per second.

  This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

TOTAL SYSTEM
: Paging rate for the total system expressed in pages per second.

  This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

CSA
: Paging rate for both CSA and ECSA, expressed in pages per second.

DB2 SPAS
: Paging rate for the DB2 Stored Procedures address space, expressed in pages per second.

  This includes total private area, VIO, and swap page-ins and page-outs (but does not include reclaims).

DB2 START:

date/time
: Start date and time for the current DB2 session.

  DB2 has been up since this time.

TRACES:

This section shows all currently active trace classes for each trace type, as specified at DB2 start or by explicit -START TRACE commands. The following trace types/classes are displayed when active:

STATS	Statistics class nn
ACCOUNT	Accounting class nn
PERFORM	Performance class nn
GLOBAL	Global class nn
AUDIT	Audit class nn
MONITOR	Monitor class nn
NONE	No traces are active

As many trace classes as will fit on each line are reported. Q indicates that more classes are active for this type.

DB2EX—DB2 Exceptions

The DB2 Exceptions panel shows exceptional conditions, the time they occurred, and the level of severity of the exception (I = Information, W = Warning, S = Severe, M = Resource or Workload Monitor-detected exceptions).

```
BOOLE AND BABBAGE----------      DB2 EXCEPTIONS      ----------PERFORMANCE MGMT
SERV ===> DB2EX            RUNNING 11:25:05 INTVL =>  3  LOG => N  TGT ==> DB2A
PARM ===>                   EXCEPTIONS DISPLAYED   1 -  10 of  10 SCROLL=> CSR
EXPAND:  MON(DSYS), LINESEL(MSG)

TIME      LEV  MSGNO            EXCEPTION

11:24:00   S DZ1090S FINAL ACTIVE LOG DATASET 75% FULL
11:24:00   S DZ1110S BSDS REDUCED TO SINGLE MODE
11:23:00   S DZ1020S IMS TASK(S) QUEUED FOR THREAD(S)
11:20:00   S DZ1050S BP(0) DM CRITICAL THRESHOLD REACHED
11:20:00   W DZ0540W ARCHIVE LOG READS OCCURRING
11:20:00   W DZ0550W MAX TSO USERS CONNECTED
11:15:30   I DZ0030I LOG ARCHIVE JOB WAITING
10:56:00   I DZ0010I (1) DB(s)/TS(s) STOPPED
10:45:45   W DZ0520W BP(0) PREFETCH DISABLED
10:28:30   I DZ0020I USER (CIR1) LOCK ESCALATED
****************************** END OF DISPLAY **********************************
```

Figure 17. DB2 Exceptions Panel

Select Code:

DB2EX

Parameter:

If no parameters are specified, all exceptions are displayed. Use one of the following parameters to view exceptions by severity level:

I Displays all information-only exceptions from the Background Exception Sampler.

W Displays all warning exceptions from the Background Exception Sampler.

S Displays all severe exceptions from the Background Exception Sampler.

M Displays all exceptions detected by the Resource or Workload Monitor services.

Description:

This display shows Background Exception Sampler, Resource Monitor, and Workload Monitor exceptions. A background exception sampler continuously scans the DB2 system at a fixed interval to detect if any exceptions exist. These exceptions, categorized by severity and time of occurrence, can be browsed in the exception display. Messages are automatically deleted when the condition no longer exists.

The exceptions are presented in descending time order (most recent exception first) and by severity within time (most severe exception first).

If the exceptions do not fit on one screen, the list can be scrolled.

See Part 4, “Monitors (Early Warnings/Recent History)” on page 321 for a description of the individual exception messages. Resource and Workload Monitor exception messages are shown with the individual service descriptions. Background Exception Sampler messages are described in “Background Exception Sampler” on page 341.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first exception displayed and the total number of exceptions that can be displayed in the scrollable list; for example:

```
ROW 3 OF  17
```

Expand:

The DB2EX display can be EXPANDed to the following displays:

MON(DSYS)
: Active Timer Requests display of all active monitors in the general DB2 system (DSYS) area.

LINESEL(MSG)
: Description of a warning message can be selected by positioning the cursor in one of the scrollable lines and pressing ENTER.

Area 1 - Exceptions

The fields on the DB2 Exceptions panel show the following:

```
TIME      LEV  MSGNO            EXCEPTION

11:24:00   S DZ1090S FINAL ACTIVE LOG DATASET 75% FULL
11:24:00   S DZ1110S BSDS REDUCED TO SINGLE MODE
11:23:00   S DZ1020S IMS TASK(S) QUEUED FOR THREAD(S)
```

where

TIME
: Time the exception occurred.

LEV(el)
: Severity level of the exception, as follows:

I Information

W Warning

S Severe

M Resource or Workload Monitor-detected exceptions

Severe exceptions are highlighted.

EXCEPTION
: Exception message text.

DBTS—Database and Table Space Status

The Database and Table Space Status panel displays information about successfully opened databases and table spaces as recognized by VSAM.

```
BOOLE AND BABBAGE----------   OPEN DB/TS STATUS     -----------PERFORMANCE MGMT
SERV ==> DBTS            INPUT    15:17:19  INTVL=> 3  LOG=> N  TGT==> DB2D
PARM ==> SO=DA                                 LINE    1 OF   80 SCROLL=> CSR
EXPAND:  MON(DSYS), LOCKD, DBIOR, LINESEL(CLAIM), LINESEL(USERS), CATALOG

DATA     TABLE    PRT                    %      FIRST  DEFR                I/O
BASE     SPACE    D.S TYP USRS  SIZE(K) UTL EXT VOLUME WRTQ STATUS         ERR
-------- -------- --- --- ----  ------- --- --- ------ ---- --------------- ---
DSNDB01               DB
DSNDB01  DBD01    001  TS    0    3,000   4     BAB029    0
DSNDB01  DSNSCT02 001  IX    0*     240   4     BAB029    0
DSNDB01  SCT02    001  TS    0*   7,800   3     BAB029    0
DSNDB01  SYSLGRNG 001  TS    0    3,000   8     BAB029    0
DSNDB06               DB
DSNDB06  DSNADH01 001  IX    0      240         BAB029    0
DSNDB06  DSNADX01 001  IX    0      240         BAB029    0
DSNDB06  DSNAPH01 001  IX    0*     360   6     BAB029    0
DSNDB06  DSNATX01 001  IX    0      560   5     BAB029    0
DSNDB06  DSNATX02 001  IX    0    1,200  10     BAB029    0
DSNDB06  DSNAUH01 001  IX    0*     120   1     BAB029    0
DSNDB06  DSNDCX01 001  IX    0    4,200   2     BAB029    0
DSNDB06  DSNDDH01 001  IX    0       40   3     BAB029    0
DSNDB06  DSNDLX01 001  IX    0       80  10     BAB029    0
DSNDB06  DSNDSX01 001  IX    0      240  10     BAB029    0
DSNDB06  DSNDTX01 001  IX    0      560   5     BAB029    0
DSNDB06  DSNDXX01 001  IX    0      160  10     BAB029    0
DSNDB06  DSNDXX02 001  IX    0      160  10     BAB029    0
DSNDB06  DSNUCH01 001  IX    0      280   2     BAB029    0
DSNDB06  DSNUCX01 001  IX    0      480         BAB029    0
DSNDB06  SYSCOPY  001  TS    0    1,800   6     BAB029    0
DSNDB06  SYSDBASE 001  TS    0   25,800   1     BAB029    0
DSNDB06  SYSDBAUT 001  TS    0      360   2     BAB029    0
DSNDB06  SYSPLAN  001  TS    0*   6,000   4     BAB029    0
DSNDB06  SYSUSER  001  TS    0*     600  10     BAB029    0
DSNDB07               DB
DSNDB07  DSN4K01  001  TS    0   94,800   9   3 BAB061    0
MZDB                  DB
MZDB     IDX000A  001  IX    0       40  10     MIS005    0
MZDB     IDX000C  001  IX    0       40  10     MIS005    0
MZDB     IDX000D  001  IX    0       40  10     MIS005    0
MZDB     IDX001A  001  IX    0       40  10     MIS005    0
******************************** END OF DATA ********************************
```

Figure 18. Database and Table Space Status Panel

Select Code:

DBTS

Parameter:

Database and table space lookup can be done system-wide, by object name, or by object group with an object name qualifier.

Note: Only open databases and table spaces are shown, unless otherwise specified with the QUAL=RESTR parameter as described below.

One of the following parameters can be specified. If no parameter is entered, all open databases and table spaces are displayed.

S database
: Selects the specified database for display.

A generic group of databases can be selected for display; for example:

```
S XYZ+
```

The plus sign (+) indicates any character.

S database,table space
: Selects the specified database and associated table space for display.

A generic group of table spaces can be selected for display by using the + qualifier; for example:

```
S +,SYS+
```

shows all table spaces with a SYS prefix and their associated data bases (catalog data sets).

F database
: Finds the database and displays it at the top of the list. The plus sign (+) can be used as a generic qualifier to represent any character in the database name.

F database,table space
: Finds the database and associated table space and displays them at the top of the list. The plus sign (+) can be used as a generic qualifier to represent any character in the database or table space name.

,VOL|V=+
: Selects the databases/table spaces using the specified volume. A generic group of volumes can be specified for display; for example:

```
V=DB2+
```

shows all databases/table spaces on any volume beginning with a DB2 prefix.

,QUAL|Q=cond
: When the list of databases and table spaces is initially displayed, all open databases and table spaces, regardless of status, are displayed.

QUAL restricts the display to only those table spaces with a certain condition as follows:

```
,QUAL=cond
```

where cond can be

INUSE
: Displays only those databases/table spaces for which the USERS value is greater than 0.

IOERR
: Displays only those databases/table spaces with a value of Y in the I/OERR column.

NOUSE
: Displays only those databases/table spaces for which the USERS value is equal to 0.

RESTR
Displays only those databases/table spaces which DB2 considers restricted, that is, access is limited or precluded by database/table space conditions.

Note: Since some restricted database/table spaces are not open, some of the data that is usually displayed may not be available for these databases/table spaces.

,STAT
Displays the status of each object in the STATUS column. The comma is required only when this parameter is used in conjunction with other parameters.

The status column is blank by default in order to provide a much faster response to the DBTS display.

Note: The ,STAT parameter is valid only for DB2 Version 4 and later. STATUS is always displayed for earlier versions.

,SORT|SO=cc
When the list of databases and table spaces is displayed initially, the list is sorted alphabetically by database/table space/partition (default) and ,SORT=DA is displayed in the PARM field. The comma is required only when this parameter is used in conjunction with other parameters. With the exception of the DATA BASE, TABLE SPACE, and PART/D.S columns, which must be sorted together, any of the column data in the DBTS display can be sorted by entering the first two characters of the column heading with the SORT parameter as

```
,SORT=cc
```

where cc can be any of the following two characters:

DA	Sorts the list alphabetically by database/table space/partition (DATA BASE, TABLE SPACE, and PART/D.S. columns)
TA	Sorts the list alphabetically by database/table space/partition, same as SORT= DA (DATA BASE, TABLE SPACE, and PART/D.S. columns)
TY	Sorts the list alphabetically by database/table space type (TYP column)
US	Sorts the list in a numerically descending order (USERS column)
SI	Sorts the list in a numerically descending order (SIZE column)
%U	Sorts the list in a numerically descending order (% UTIL column)
EX	Sorts the list in a numerically descending order (EXT column)
FI	Sorts the list alphabetically by volume (VOLUME column)
DE	Sorts the list in a numerically descending order (DEFER WRT Q column)
ST	Sorts the list alphabetically by status (STATUS column)
I/	Sorts the list in reverse alphabetical order by I/O error status (I/O ERR column)

Note: You also can sort on each column by tabbing to the column header and pressing ENTER.

Description:
This panel displays information about selected open databases and table spaces and various status indicators such as error indicators, size and extent information, percent utilization, and number of users currently accessing the table space. This information is used to detect database contention and response time degradation problems and to monitor DB2 resource usage.

This list is scrollable.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first object displayed and the total number of objects that can be displayed in the scrollable list; for example:

```
LINE 1 OF  85
```

Expand:

The DBTS display can be EXPANDed to the following displays:

MON(DSYS)
: Active Timer Requests display of all active monitors in the general DB2 system (DSYS) area

LOCKD
: Lock Contention by Database/Table Space display

DBIOR
: I/O Analysis by Database/Table Space display

LINESEL(CLAIM)
: Displays showing the status of claims and drains on objects within a selected table space can be selected by tabbing to the first column (DATA BASE) in one of the scrollable lines and pressing ENTER.

  This action transfers you to the CLAIM service with a parameter of DBTS=(dbname,tsname), where dbname and tsname are, respectively, the database name and table space name of the line at the cursor location.

LINESEL(USERS)
: List of current users of a database/table space can be selected by tabbing to the USRS column in one of the scrollable lines and pressing ENTER.

  This action transfers you to the USERS service with a parameter of DBTS=(dbname,tsname), where dbname and tsname are, respectively, the database name and table space name of the line at the cursor location.

CATALOG
: Corresponding RxD2 catalog display for the selected object(s), if RxD2 is installed. A detailed list of databases, table spaces, or indexes is shown, using the current active selection parameters (S database,table space).

  Detailed catalog information is available per object from these lists. They provide access to tablepart or indexpart specifications, as well as a LISTCAT option.

  Note: Access is possible to remote DB2 subsystems only if connected with DDF to a local DB2 (in the same MVS system as the TS).

Area 1 - Open Database and Table Space Status

The following fields show open database and table space status.

```
DATA     TABLE    PRT                    %      FIRST  DEFR                I/O
BASE     SPACE    D.S TYP USRS  SIZE(K) UTL EXT VOLUME WRTQ STATUS         ERR
-------- -------- --- --- ----  ------- --- --- ------ ---- --------------- ---
DSNDB01               DB
DSNDB01  DBD01    001  TS    0    3,000   4     BAB029    0
DSNDB01  DSNSCT02 001  IX    0*     240   4     BAB029    0
DSNDB01  SCT02    001  TS    0*   7,800   3     BAB029    0
DSNDB01  SYSLGRNG 001  TS    0    3,000   8     BAB029    0
DSNDB06               DB
DSNDB06  DSNADH01 001  IX    0      240         BAB029    0
DSNDB06  DSNADX01 001  IX    0      240         BAB029    0
DSNDB06  DSNAPH01 001  IX    0*     360   6     BAB029    0
DSNDB06  DSNATX01 001  IX    0      560   5     BAB029    0
DSNDB06  DSNATX02 001  IX    0    1,200  10     BAB029    0
DSNDB06  DSNAUH01 001  IX    0*     120   1     BAB029    0
DSNDB06  DSNDCX01 001  IX    0    4,200   2     BAB029    0
DSNDB06  DSNDDH01 001  IX    0       40   3     BAB029    0
DSNDB06  DSNDLX01 001  IX    0       80  10     BAB029    0
DSNDB06  DSNDSX01 001  IX    0      240  10     BAB029    0
DSNDB06  DSNDTX01 001  IX    0      560   5     BAB029    0
DSNDB06  DSNDXX01 001  IX    0      160  10     BAB029    0
DSNDB06  DSNDXX02 001  IX    0      160  10     BAB029    0
DSNDB06  DSNUCH01 001  IX    0      280   2     BAB029    0
DSNDB06  DSNUCX01 001  IX    0      480         BAB029    0
DSNDB06  SYSCOPY  001  TS    0    1,800   6     BAB029    0
DSNDB06  SYSDBASE 001  TS    0   25,800   1     BAB029    0
DSNDB06  SYSDBAUT 001  TS    0      360   2     BAB029    0
DSNDB06  SYSPLAN  001  TS    0*   6,000   4     BAB029    0
DSNDB06  SYSUSER  001  TS    0*     600  10     BAB029    0
DSNDB07               DB
DSNDB07  DSN4K01  001  TS    0   94,800   9   3 BAB061    0
MZDB                  DB
MZDB     IDX000A  001  IX    0       40  10     MIS005    0
MZDB     IDX000C  001  IX    0       40  10     MIS005    0
MZDB     IDX000D  001  IX    0       40  10     MIS005    0
MZDB     IDX001A  001  IX    0       40  10     MIS005    0
******************************** END OF DATA ********************************
```

DATA BASE
: Eight-character database name, as it appears in the DB2 catalog.

TABLE SPACE
: Eight-character table space name, defined as part of the adjacent database, as it appears in the DB2 catalog.

PRT/D.S
: Partition number or data set sequence number.

If this table space is defined as a partitioned table space, then this number is its partition number. Otherwise, it is the data set sequence number.

TYP

Type can be

DB	Data base
TS	Table space
IX	Index
-D	Data set
-P	Partition

USRS

For most table spaces, this is the number of users currently accessing this object. There are some system catalog table spaces for which this is not true; in these cases, the value in this field is a cumulative value from the initial START DB2 command. Those database/table spaces for which this is true are denoted with an * to the right of this column. Some of the table spaces and index spaces for which this exception holds are

SYSPLAN — Table space that contains the following tables:

- SYSIBM.SYSDBRM
- SYSIBM.SYSPLAN
- SYSIBM.SYSPLANAUTH
- SYSIBM.SYSPLANDEP
- SYSIBM.SYSSTMT

DSNAPH01 — Index space for SYSIBM.SYSPLANAUTH

SYSUSER — Table space for SYSIBM.SYSUSERAUTH

DSNAUH01 — Index space for SYSIBM.SYSUSERAUTH

SCT02 — Table space for skeleton cursor tables

DSNSCT02 — Index space for skeleton cursor tables

SIZE(K)

Contains the size of the object in kilobytes; gigabytes are displayed in kilobyte units; for example, 1 gigabyte is displayed as 1,000K kilobytes.

% UTL

Percentage utilized.

This field shows the amount of space in use in this table space or partition as a percentage.

Note: This calculation is done per page and shows the percentage of total pages in use. (A page in use may not be full.)

EXT

Number of VSAM extents for this partition or table space (VSAM data set).

FIRST VOLUME

DASD volume where the partition or table space (VSAM data set) resides or the first volume of a storage group or multi-volume data set.

STATUS

Current state of this object, which can be one or more of the following:

CHKP Table space is in check pending state.

COPY Image copy is required for this object.

DEFER Database is marked for deferred restart.

GRECP Object (a table space, a table space partition, index space, or index space partition) is marked recovery pending because of the failure of a group buffer pool. (This status value appears only on spaces. It does not apply to databases.)

INDBT Indoubt processing is required.

LPL Object has pages or ranges of pages that are unavailable because of logical or physical damage.

LSTOP Logical partition is stopped.

OPENF Object had an open data set failure.

PSRCP Object is in a page set recovery pending state.

RECP Table space or index space is in a recovery pending state.

REST Database is under restart processing.

RO Database is started read only.

RW Database is started read and write.

Only one RW or RO can occur.

STOPE Database is being stopped because of a connect failure encountered during end restart.

STOPN Database is in the process of being stopped.

STOPP A stop is pending for this database.

UT Database is started for use by utilities only.

UTRO Database was started RW, but a utility in process has changed access to RO.

UTRW Database is started RW, and a utility is currently in process.

UTUT Database was started RW, but a utility is in process and only UT access is allowed. Only UT or UTUT can occur.

If more than one status occurs, as each status is cleared, the next status in sequence is displayed.

Note: This column is blank by default in order to provide a much faster response to the DBTS display. To display the status values in this field, issue the ,STAT parameter. Database headers always display as blank.

DEFR WRTQ

Number of pages currently on the deferred write queue for this table space partition.

This reflects the number of updates which have been made, but not yet physically written to the table space. Updates will be pending until the user reaches a commit point. However, they may continue to be pending after the commit until a system checkpoint or the deferred write threshold is reached.

Note: This is shown only for objects (either partitions or table spaces) that exist as MVS VSAM data sets.

I/O ERR

Either Y or blank.

Y indicates an error range of physical pages containing I/O errors exists that restricts the use of this object. The DB2 DISPLAY DATABASE command shows the actual ranges of pages in error.

ZPARM—DB2 System Parameters

The DB2 System Parameter panel is used to display installation parameters in effect.

Note: This display is functionally stabilized; however, it does not support all the new data for DB2 6.1 and will be removed from the product in future releases. This display is no longer documented in this manual; however, extensive help panels are available online.

The new DB2 6.1 counts, as well as many parameters not previously shown, are supported in the windows mode views for ZPARM, which can be accessed from the Installation Parameters Easy Menu (EZDZPARM). These views also provide hyperlinks to related statistics views to simplify analysis of the effects of various parameters on DB2 performance.

It is recommended that you use these updated windows mode views to analyze the installation parameters.

See Volume 3 of the *MAINVIEW for DB2 User Guide* for information about these views.

Chapter 11. User Activity Displays

This chapter describes the analyzer display services that provide overall and detail information about the status and activity of users of a targeted DB2 system.

USERS—User Summary

The DB2 User Summary panel summarizes the overall status and activity of DB2 users.

```
BOOLE AND BABBAGE----------      USER SUMMARY       -------------  RX AVAILABLE
SERV ==> USERS            INPUT   13:43:00  INTVL=> 3  LOG=> N  TGT==> DB2F
PARM ==> ,SORT=US                            ROW      1 OF      6 SCROLL=> CSR
EXPAND:  MON(USER), THRDHIST, LINESEL(DUSER)
OPTION:  CONNECT, CORRID

USER ID  PLAN     CONNECT  CPU      %CPU  ELAPSED  #STMTS #LCK ACTIVITY STATUS
-------- -------- -------- -------- ----- -------- ------ ---- -------- -------
ACCTDEP  TSMCOM3  CICSCN3    665 us  0.0%    35 s       0    1 SELECT   ACT-USR
ACCTDEP  TSMCOM3  CICSCN3  1,961 us  0.0% 00:01:32      1    1 SELECT   ACT-USR
CJN4              DB2CALL     18 s   0.0% 05:14:48      0    0
HHH2              DB2CALL  5,496 ms  0.3% 01:27:28      0    0
HHH3     DSNESPRR TSO         53 s * 0.0% 01:24:27      5    8          SWAP
OLTC              DB2CALL     22 s   0.0% 08:00:21      0    0
********************************* END OF DATA *********************************
```

Figure 19. DB2 User Summary Panel

Select Code:

USERS

Parameter:

The following parameters can be specified:

- A user connection type or blank.

  If no parameter is specified (blank), all users currently connected at thread level are displayed. Or, only those users with a specific connection type can be displayed by specifying

  – TSO or T
  – BATCH or B
  – UTIL or U (Utility)
  – CAF or X (Call Attach Facility)
  – IMS or I
  – CICS or C
  – DBAT or D (Database Access Thread)
  – DDF (Both DBAT and DIST, DDF servers/requesters)

  If a parameter is specified ALL or A, all connections are displayed. This includes system threads.

- ,DBTS=(dbname,tsname)

  Selects only current users of the database, where dbname and tsname are the names of the database and table space. Only dbname is required.

- ,SUMM=YES

  Displays a summary of DB2 connections and attach modes above the list of users.

- ,SORT=US

  When the list of users is displayed initially, the list is sorted alphabetically by user ID (default) and ,SORT=US is displayed in the PARM field (the comma is a required positional parameter for SORT). Any of the column data in the USER display can be sorted by entering the first two characters of the column heading with the SORT parameter as

  ```
  SORT=cc
  ```

  where cc can be any of the following two characters:

  US Sorts the list alphabetically by user ID (USER ID column)
  PL Sorts the list alphabetically by plan name (PLAN column)
  CO Sorts the list alphabetically by connection type (CONNECT column)
  CR Sorts the list alphabetically by correlation ID (CORRID column)
  CP Sorts the list in a numerically descending order (CPU column)
  %C Sorts the list in a numerically descending order (%CPU column)
  EL Sorts the list in a numerically descending order (ELAPSED column)
  #S Sorts the list in a numerically descending order (#STMTS column)
  #L Sorts the list in a numerically descending order (#LOCKS column)
  AC Sorts the list alphabetically by DB2 activity (ACTIVITY column)
  ST Sorts the list alphabetically by the user status displayed (STATUS column)

  Note: You also can sort on each column by tabbing to the column header and pressing ENTER.

Description:

All current users of the DB2 subsystem, or a user-requested subset of users such as TSO or IMS DB2 users, are presented in a scrollable display by user ID. The current status, access facility used, activity indicators such as CPU usage and locks, the call in progress, the plan in use, and exception conditions for each thread are shown.

With this overview display of DB2 user activity, it is possible to determine how well the total system is performing and whether the activity of one user is impacting others. For example, a problem could exist because of excessive CPU usage or lock contentions on DB2 tables. Users queued for a thread are also shown as in an exception status.

Note: A pound sign (#) is used after the CPU column to indicate that SRB time is being used for the relative CPU time while executing in DB2 code (Database Access Threads only).

An asterisk (*) is used in this display to indicate the following circumstances:

- An asterisk preceding the CONNECT column indicates this is a Database Access Thread (DBAT) working on behalf of a remote user.
- An asterisk after the CPU column indicates the user is swapped out and Address Space Control Block (ASCB) time is reported.
- An asterisk after the PLAN column indicates this is a parallel query or utility subtask.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first user displayed and the total number of users that can be displayed in a scrollable list.

For example:

```
ROW 1 OF  55
```

Expand:

The USERS display can be EXPANDed to the following displays:

MON(USER)

Active Timer Requests display of all active monitors in the user activity (USER) area.

THRDHIST

DB2 Trace Entries (LTRAC) display for the standard thread history trace, if active. Here you can view recently completed threads no longer shown in USERS.

LINESEL(DUSER)

A detailed display of information about a specific user (DUSER) can be selected from this user list by positioning the cursor on the line for that user and pressing ENTER.

Option:

You can select what information is displayed in the CONNECT column with the following OPTION buttons:

CONNECT

Displays the connection type (default).

CORRID

Displays 8 bytes of the correlation ID. The information shown varies for each of these connection types:

IMS

Last 8 bytes of the correlation ID, which is equivalent to the PSB name the transaction is using.

Database Access Thread (DBAT)

First 8 bytes of the correlation ID for the requesting connection.

All others

First 8 bytes of the correlation ID.

- For TSO and batch users, this is equivalent to the TSO ID and the job name.
- For CICS users, this contains the thread type, thread number, and transaction name.

Note: The correlation ID is a better identifier than connection type for CICS and Database Access threads.

Area 1 - Connection Summaries

This area is displayed only if the SUMM=YES parameter is specified. It shows the number of DB2 connections and the attach modes as

```
                    TSO:     3          CAF:     1      INDOUBT:     0
USERS:      6    BATCH:     0          IMS:     0    SUSPENDED:     0
                   UTIL:     0         CICS:     2       QUEUED:     0
           DB-ACCESS(*):     0
          INACTIVE DBAT:     0
```

where

USERS
Total number of users connected to DB2 by corresponding attach modes.

Counts are shown for the following DB2 connection types:

- TSO
- BATCH
- UTIL (Utility)
- CAF (Call Attach Facility)
- IMS
- CICS
- DB-ACCESS(*) (Active Database Access Thread (DBAT))

  These are identified by an asterisk in the PLAN column of the list of users.
- INACTIVE DBAT (Inactive Database Access Thread)

INDOUBT
Current number of indoubt threads.

Indoubt conditions occur when a task fails between the end of Phase 1 commit processing and the beginning of Phase 2 commit processing. The unit of recovery is then said to be indoubt.

SUSPENDED
Number of threads currently suspended because of locking.

QUEUED
Number of connected DB2 users awaiting the completion of a CREATE THREAD request.

Area 2 - User List

This portion of the screen displays the individual user activity.

```
USER ID  PLAN     CONNECT  CPU      %CPU  ELAPSED  #STMTS #LCK ACTIVITY STATUS
-------- -------- -------- -------- ----- -------- ------ ---- -------- -------
ACCTDEP  TSMCOM3  CICSCN3    665 us  0.0%    35 s       0    1 SELECT   ACT-USR
ACCTDEP  TSMCOM3  CICSCN3  1,961 us  0.0% 00:01:32      1    1 SELECT   ACT-USR
CJN4              DB2CALL     18 s   0.0% 05:14:48      0    0
HHH2              DB2CALL  5,496 ms  0.3% 01:27:28      0    0
HHH3     DSNESPRR TSO         53 s * 0.0% 01:24:27      5    8          SWAP
OLTC              DB2CALL     22 s   0.0% 08:00:21      0    0
********************************* END OF DATA *********************************
```

where

USER ID
User, as identified to DB2.

Note: MVDB2 uses the jobname for batch and TSO users (TSO logon ID) and the DB2 authorization ID for IMS and CICS users. The contents of this field vary widely from site to site. See the IBM *DB2 Administration Guide* for a more detailed description of DB2 authorization IDs.

PLAN
DB2 application plan in use by the user.

Note: An asterisk (*) at the beginning of this column indicates this is a parallel query or utility subtask.

CONNECT
Connection type in use by this user. If preceded by an asterisk, this is a Database Access Thread (DBAT) working on behalf of a remote user.

Possible types are

- TSO
- BATCH
- UTILITY
- DB2CALL (Call Attach Facility)
- IMS subsystem ID
- CICS jobname
- SERVER
- DB2 subsystem ID (for internal DB2 threads)

CPU

Accumulated CPU time used by this DB2 user.

This time is calculated as follows:

- If the user is currently *swapped in* by MVS

  The task (TCB) CPU time for the thread subtask minus the CPU time when the thread was established.

- If the user is currently *swapped out* by MVS

  The CPU time for the user's address space (all tasks within this address space) minus the CPU time when the thread was established.

Note: An asterisk (*) after the CPU column indicates the user is swapped out and Address Space Control Block (ASCB) time is reported.

A pound sign (#) after the CPU column indicates that SRB time is being used for the relative CPU time while executing in DB2 code. This applies only to Database Access Threads (DBATs).

N/A in the CPU column indicates that the user's thread TCB could not be accessed and, thus, the CPU time could not be calculated.

%CPU

Percentage of the CPU devoted to this DB2 user.

Percentage of CPU activity is measured by sampling the CPU consumed by the target address spaces over a short period of time and dividing it by the amount of CPU consumable over this same period.

ELAPSED

Elapsed time for this task.

This time is calculated as follows:

- If the user is currently ***swapped in*** by MVS

  The current time minus the time when the user's thread was established.

- If the user is currently ***swapped out*** by MVS

  The current time minus the time when the user's address space was established.

  Note: An asterisk (*) after the CPU column indicates the user is swapped out and Address Space Control Block (ASCB) time is reported.

- If the user is a Database Access Thread (DBAT)

  The current time minus the time when the thread was established.

  Note: A pound sign (#) after the CPU column indicates that this user is a Database Access Thread (DBAT).

#STMTS

Number of SQL statements made by this user within this plan.

#LOCKS

Number of locks currently held by this user. If the number of locks held by a user is in the top five of #LOCKS for all users, this field is highlighted.

ACTIVITY

Indicates the current type of DB2 activity for this thread. If the thread is executing in user application code, this field is the most recent DB2 activity. Examples of type of activity shown are

SQL statement type, such as SELECT, INSERT, DELETE, or FETCH, for programs.

DSN command.

CRT TAB for CREATE TABLE.

ROLLBACK for COMMIT ROLLBACK.

Blank for connected users not active in DB2.

Note: When displaying a thread that is executing a DB2 utility, this field contains the utility phase name.

When displaying DB2 system tasks (user ID = SYSOPR), this field contains the full correlation identifier for the displayed task. You can determine the function of the displayed system task by referring to the chapter, “System-Agent Correlation Identifiers”, in the *DB2 Diagnosis Guide and Reference* manual.

STATUS

Indicates current status of this user. This field can contain one of the following:

IRLM	User is waiting to obtain an IRLM-held DB2 lock. This condition is highlighted.
SWAP	User is swapped out by MVS.
ACT-DB2	User is active in DB2.
ACT-USR	User is active in user code.
ACT-VTM	Thread has transferred control to VTAM to process a distributed request.
SUS-VTM	Thread is suspended, waiting for a VTAM response for a distributed request.
Q’D THD	User is waiting for a DB2 thread.
CONNECT	User is connected with DB2. but not at plan level. All users with CONNECT status show blanks in all but CONNECT STATUS fields. USERID may also be blank if the CCB for this user has not been established.
corrid	For system tasks, a portion of the correlation ID.

Note: When displaying DB2 system tasks (user ID = SYSOPR), this field contains the full correlation identifier for the displayed task. You can determine the function of the displayed system task by referring to the chapter, “System-Agent Correlation Identifiers”, in the *DB2 Diagnosis Guide and Reference* manual.

DUSER—User Detail Status

The DB2 User Detail panel displays user connection and resource details.

The following figures show representative displays of each DUSER section:

```
BOOLE AND BABBAGE----------   DETAIL USER STATUS    -------------  RX AVAILABLE
SERV ==> DUSER           INPUT    11:07:14  INTVL=> 3  LOG=> N  TGT==> DB2G
PARM ==> BOLHHH4                              ROW     1 OF   110 SCROLL=> CSR
EXPAND:  MON(USER), UTRAC, ST(START TRACE), LOCKE, EXPLAIN, PT, CICSE, CMRTASK
         ACCOUNTING: ENV, ELAPSED, SQLCOUNTS, BPOOL, LOCKS, PRLL, SPAS, DDF
CURRENT........11:07:13.53 PLAN..............DSNESPRR TYPE..............ALLIED
START..........10:58:49.39 AUTHID............BOLHHH4 CONNECT..........TSO/TSO
ELAPSED........00:08:24 ORIG PRIM AUTH.....BOLHHH4 CORR ID.....BOLHHH4
STATUS..............IN-DB2 COMMITS..................0 ROLLBACKS..............0
-------------------------------------------------------------------------------
RUNTIME ANALYSIS   IN DB2     IN APPL.      TOTAL      %IN DB2(=)     TOTAL(*)
----------------   --------   --------   --------     0 ...25...50...75..100%
ELAPSED TIME       00:08:23     718 ms   00:08:24     | ===================* |
CPU TIME           00:01:22     123 ms   00:01:22     | ===                  |
DB2 WAIT TIME         20 s                            | <                    |
- - - - - - ACTIVITY - - - - - -      - - - - - KEY INDICATORS  - - - - - - -
TOTAL SQL......................2     SQL: DYNAMIC(PREPARE)=     1
GETPAGES..................416,803     I/O RSP: SYNC=    45 ms, ASYNC=   107 ms
SYNC READS (PRLL=00) .........147
PREFETCH PAGES READ.........1,051
UPDATES/COMMIT................0.0
BFR HIT RATIOS:...VP=100%,HP=100%
- - - - - - - - - - - - - -SQL STATEMENT ANALYSIS - - - - - - - - - - - - - - -
STATEMENT #:    193                   STATEMENT TYPE:  OPEN
ACTIVE IN DB2                CPU TIME: 1,897 ms     ELAPSED TIME: 00:01:06
Package/DBRM: DSNESM68  (DYNAMIC)           PLAN ISOLATION LEVEL: RR
PROCEDURE/UDF/TRIGGER:  DSN8SPAS_TEST
SELECT * FROM LONG_SQL ;
```

Figure 20. DB2 User Detail Status Panel (Base Section)

See “Thread Identifiers and Status Summary (Base Section)” on page 169.

```
- - - - - - - - - - - - - ENVIRONMENTAL INDICATORS - - - - - - - - - - - - - -
JOB NAME.......BOLHHH4    STEP NAME......IKJDB2G    PROC STEP.....T021T004
LUWID.........USBOOL01.LUDB2G.AC1E9056AFF70001      LUWID TOKEN........174
RLF TABLE ID..NOT ACTIVE                            PROGRAM NAME..DSNECP10

        - - - - - - - - - - CICS CONNECTION - - - - - - - - - - -
TRAN...D8CS                      APPLID.......CICS332B
TERM...       TASK.....37        USERID.......            PROGRAM...DFHEDFX
DPMODE.HIGH   ROLBE...YES         THREAD TYPE..ENTRY        RCT TABLE DSNCRCTH
STATUS IN CICS...KCCOMPAT        CICS CPU TIME........72 ms
ACCOUNTING TOKEN......(TOKENE NOT SPECIFIED)

---or--

       - - - - - - - - - - IMS CONNECTION- - - - - - - - - - - - -
PST.....0001              REGION TYPE...MPP         PSB NAME...DSN8IC22
TRAN....DSN8ICS           CLASS...........1         PROGRAM....DSN8IC22
CONTROL REGION NAME...IMS31X                        LTERM......- none -
STATUS IN IMS: I/ACTV-USR

---or--

        - - - - - - - - - UTILITY CONNECTION- - - - - - - - - - -
UTILITY.......STOSPACE    PHASE NAME....STOSPACE    REC COUNT.....     n/a
UTILITY QUALIFIER.....TEST.UTILITY
```

Figure 21. DUSER Environment (ENV) Section

See “Environmental Indicators” on page 182.

```
- - - - - - - - ELAPSED TIME ANALYSIS (ACCTG CLASSES 2,3 ONLY) - - - - - - - -

CATEGORY           #EVENTS AVG/EVENT  ELAPSED  %TOTAL
----------------   ------- --------- -------- ------- 0 ...25...50...75..100%
ELAPSED TIME                                           |                      |
  IN DB2                             00:12:39   99.86 | ******************   |
  IN APPLICATION                     1,038 ms    0.13 | <                    |
 --TOTALS--                          00:12:40  100.00 | ******************** |
WAITS IN DB2 (LOCAL)                                   |                      |
  LOCK/LATCH            0      0 us     0 us    0.00 |                      |
  I/O WAIT             19     21 ms   392 ms    0.05 | <                    |
  LOG WRITE I/O         0      0 us     0 us    0.00 |                      |
  OTHER READ I/O        0      0 us     0 us    0.00 |                      |
  OTHER WRITE I/O       0      0 us     0 us    0.00 |                      |
  UNIT SWITCH EVENTS                                   |                      |
  ..COMMIT/ROLLBK       0      0 us     0 us    0.00 |                      |
  ..OPEN/CLOSE          6  8,965 ms    54 s     7.07 | *                    |
  ..SYSLGRNG            1    700 ms   700 ms    0.09 | <                    |
  ..DATASPACE MGR       4    243 ms   973 ms    0.12 | <                    |
  ..OTHER               0      0 us     0 us    0.00 |                      |
  ARCH. LOG(QIS)        0      0 us     0 us    0.00 |                      |
  ARCH.READ(TAPE)       0      0 us     0 us    0.00 |                      |
  DRAIN LOCK            0      0 us     0 us    0.00 |                      |
  CLAIM RELEASE         0      0 us     0 us    0.00 |                      |
  PAGELATCH CONT.       0      0 us     0 us    0.00 |                      |
  SPAS SERVER TCB       0      0 us     0 us    0.00 |                      |
WAITS IN DB2 (GLOBAL)                                  |                      |
  LOCKS                 0      0 us     0 us    0.00 |                      |
  MSG. PROCESSING       0      0 us     0 us    0.00 |                      |
---TOTAL WAITS---      30  1,862 ms    56 s     7.34 | *                    |
*NOT ACCOUNTED                       00:11:44   92.54 | *****************    |
```

Figure 22. DUSER Elapsed Time (ELAPSED) Section

See “Elapsed Time Analysis” on page 188.

```
- - - - - - - - - - - - SQL STATEMENT EXECUTION COUNTS - - - - - - - - - - - -
SELECT...............0    LOCK TABLE..............0    CREATE............0
INSERT...............0    GRANT/REVOKE............0    DROP..............0
UPDATE...............0    SET CURR.SQLID..........0    ALTER.............0
DELETE...............0    SET HOST VAR. ..........0
                           SET CURR.DEGREE.........0    COMMENT ON........0
PREPARE..............1    SET CURR. RULES.........0    LABEL ON..........0
DESCRIBE.............0    CONNECT TYPE 1..........0
                           CONNECT TYPE 2..........0    CREATE TEMP.......0
OPEN.................1    SET CONNECTION..........0    RENAME TBL........0
FETCH................5    RELEASE.................0
CLOSE................1    CALL....................0
                           ASSOCIATE LOCATOR.......0
                           ALLOCATE CURSOR.........0

** DML................8    ** DCL..................0    ** DDL............0
** REOPTIMIZED........0
                   - - - - DYNAMIC SQL CACHE COUNTS - - - -
STMT FOUND...........0    KPDYN-PREP.AVOID........0    STMT DISCRD.......0
STMT NOT FOUND.......0    KEEPDYN_IMPL.PREP.......0    STMT PURGED.......0
```

Figure 23. DUSER SQL Statement Execution Counts (SQLCOUNTS) Section

See “SQL Statement Execution Counts” on page 193.

```
- - - - - - - - - - - - - - BUFFER POOL ACTIVITY - - - - - - - - - - - - - - -
ACTIVITY                TOTAL       BP0       BP3
-------------------  --------  --------  --------
GETPAGES...........        30        25         5
SYNC READS.........        25        15        10
GETPAGES/READIO....       1.2       1.7         0
COND. GP FAILURES..         0         0         0

SEQ. PREFETCH REQS.         0         0         0
LIST PREFETCH REQS.         0         0         0
DYNAMIC PREFETCHES.         2         0         2
ASYNC PAGES READ...         0         0         0
PAGES/PREFETCH REQ.       0.0       0.0       0.0

PAGE UPDATES.......         3         2         1
IMMEDIATE WRITES...         0         0         0

HP SYNC READS......         0         0         0
HP SYNC READ FAIL..         0         0         0
HP ASYNC PAGES READ         0         0         0
HP WRITES..........         0         0         0
HP WRITE FAILURES..         0         0         0

             - - - - GLOBAL BUFFER POOL (DATA SHARING ONLY) - - - -
CF READS (BUFFER CROSS INVALIDATION)
 -DATA RETURNED....         2         -         2
 -R/W INTEREST.....         1         -         1
CF READS (DATA NOT IN BUFFER POOL)
 -DATA RETURNED....         2         -         2
 -R/W INTEREST.....         1         -         1
 -NO R/W INTEREST..         1         -         1
CF-WRITE (CHGD PGS)         2         -         2
CF-WRITE (CLEAN PG)         1         -         1
NBR UNREG PAGES....         1         -         1
NBR EXPLICIT XI....         0         -         0
NBR WRITES 2ND BP..         0         -         0
```

Figure 24. DUSER Buffer Pool (BPOOL) Section

See “Buffer Pool Activity” on page 197.

```
- - - - - - - - - - - - - - - LOCK ACTIVITY  - - - - - - - - - - - - - -  - -
TIMEOUT.........................0     MAX PAGE/ROW LOCKS...............1
DEADLOCK........................0
                                      LOCK REQUEST.....................6
SUSPEND-LOCK....................0     UNLOCK REQUEST...................9
SUSPEND-LATCH...................0     QUERY REQUEST....................0
SUSPEND-OTHER...................0     CHANGE REQUEST...................8
                                      OTHER REQUEST....................0
ESCALATION(SHR).................0
ESCALATION(EXCL)................0

DRAIN REQUEST...................0     DRAIN FAILURE....................0
CLAIM REQUEST...................2     CLAIM FAILURE....................0
                   - - - - GLOBAL LOCK ACTIVITY - - - -
LOCK REQUEST....................1     XES LOCK REQUEST.................3
LOCK CHANGE REQUEST.............0     XES CHANGE REQUEST...............0
UNLOCK REQUEST..................0     XES UNLOCK REQUEST............... 1

IRLM GLOBAL SUSPEND.............0     XES GLOBAL SUSPEND...............0
FALSE CONTENTION................0

INCOMPATIBLE RETAINED...........0     NOTIFY MESSAGES SENT.............0
```

Figure 25. DUSER Locks (LOCKS) Section

See “Lock Activity” on page 200.

```
- - - - - - - - - - - - - - - PARALLELISM  - - - - - - - - - - - - - - - - -
MAXIMUM DEGREE.................2        FALLBACK - NO BUFFER............1
GROUPS EXECUTED................3        FALLBACK - NO ESA SORT..........0
-- PLANNED DEGREE..............1        FALLBACK - AMBIG. CURSOR........1
-- REDUCED DEGREE..............2

PARALLEL TASKS.................3        FALLBACK - NO ENCLAVE...........0
CORRELATION TOKEN.....X’00000000’        FALLBACK - RLF LIMITED.........NO
                        - - - - SYSPLEX - - - -
COORDN/ASSISTANT..........COORDN        FALLBACK - NO COORDN............1
PRLL COORDN NAME................        FALLBACK - ISOL RR/RS...........2
MAXIMUM MEMBERS................2        REDUCED  - VP SHORTAGE..........0
INTENDED PRLL GROUPS...........0
QUERY REFORMULATED (ENV)........0        QUERY REFORMULATED (BP).........0
```

Figure 26. DUSER Parallelism (PRLL) Section

See “Parallelism” on page 203.

```
- - - - - - - - - - - - - - - - DDF SUMMARY - - - - - - - - - - - - - - - - -
CURRENT LOCATION: DB2A    (ALLIED DIST REQUESTER)
  WORKSTATION USER ID...bolbpl2          WORKSTATION NAME..
  WORKSTATION TRANSACTION ID...db2bp.exe

  MVS WLM SERVICE CLASS NAME......DB2JWLM

REMOTE                                                        FROM         TO
  LOCATION:         DB2J
  REMOTE PROD-ID:   DSN06010
  DB AGENT CPU.............   15 ms
  ELAPSED LOCAL............  945 ms
  ELAPSED REMOTE...........  491 ms     MESSAGES                 1          1

  CONVERSATION ID:  X'7F6893A8'
      STATUS                    INACTIVE  SESSION ID       X'F077F7F6632FA4DE'
      LAST VTAM ACTIVITY            SEND  TIME OF LAST MESSAGE    14:36:55
```

Figure 27. DUSER DDF Summary (DDF) Section

See “DDF Summary” on page 206.

```
- - - - - - - - - - - - - -STORED PROCEDURES- - - - - - - - - - - - - - - -
EXECUTING STORED PROC..........YES        WAITING FOR SCHEDULE...........NO
STORED PROCEDURE NAME....DSN8SPAS_TEST
THREAD TOKEN............X'7FFFFFFF'

SPAS CPU TIME..............200 us        SQL CALLS......................9
SPAS IN-DB2 TIME...........200 us        CALLS ABENDED..................0
SPAS WAITING ON TCB........600 ms        CALLS REJECTED.................0
                                         CALLS TIMED OUT................0
Total elapsed time.........200 us        WAITS ON TCB...................6
Elapsed time in SQL........200 us
                                         SQL nest level................5

---and/or--

- - - - - - - - - - - - USER-DEFINED FUNCTIONS- - - - - - - - - - - - - - - -
UDF CPU TIME...............200 us        UDFs executed.................9
UDF IN-DB2 TIME............200 us        UDFs ABENDED..................0
UDF WAITING ON TCB.........600 ms        UDFs REJECTED.................0
                                         UDFs TIMED OUT................0
Total elapsed time.........200 us
Elapsed time (SQL).........200 us        SQL STMTS executed...........15
                                         SQL nest level................5

---and/or--

- - - - - - - - - - - - - - - TRIGGERS  - - - - - - - - - - - - - - - - - - -
-- non-enclave times --                  Stmt TRG activated............9
CPU Time...................200 us        Row TRG activated.............0
Elapsed time...............600 ms        Trigger SQL errors............0
-- enclave times --
CPU time...................200 us        CPU time (before enclave)...200 us
Elapsed time...............200 us
                                         SQL nest level................5
```

Figure 28. DUSER Routines (RTN) Section

See “Routines” on page 208.

Select Code:

DUSER

Parameter:

A parameter for this panel is required to identify the thread to be displayed. Any of the following identifiers can be used:

- Correlation ID
- User ID - the value shown on the USERS service display
- Authorization ID

If authorization ID is used and is not unique, the first thread found with that authorization ID is displayed.

To locate the user, the service first assumes the parameter is a correlation ID and searches for a match. The second search for a user match assumes the parameter is a user ID (jobname for batch or TSO or an authorization ID for CICS or IMS users). The final search to identify the user assumes an authorization ID for batch or TSO users (it is not necessary to repeat this search for CICS and IMS users).

Connection name also is accepted as an optional parameter to further identify the thread.

Note: This display can also be selected directly from the list of users displayed by the USERS service by positioning the cursor on the line for the user and pressing ENTER.

An optional parameter also is available, which issues a CANCEL THREAD or CANCEL DDF THREAD command (if you are authorized to issue DB2 commands):

- ,CANCEL

See the Usage Notes for these commands in the *DB2 Command and Utility Reference* for further information.

Note: The BBI-SS PAS must also have DB2 command authorization (see the *MAINVIEW for DB2 Customization Guide* for further information).

Description:

This service provides a complete display for one user. The most critical data for that user is summarized in the base section. All detail data is provided in sections that can be seen either by scrolling down or by using an expand button or tab point.

These sections provide information on

- Environmental Indicators
- Elapsed Time Analysis
- SQL Statement Execution Counts
- Buffer Pool Activity
- Lock Activity
- Parallelism
- DDF Activity
- Routines

Active Trace Selection:

If a detail trace is active for a user, the highlighted message, EXPAND FOR DETAIL TRACE, is displayed. You can then select a detailed display of the trace events for the current active thread for the specified user. Position the cursor on any line in the body of this panel and press ENTER.

Expand:

The DUSER display can be EXPANDed to the following panels:

MON(USER)	Active Timer Requests display of all active monitors in the user activity (USER) area
UTRAC	User Detail Trace display (if trace active)
ST(START TRACE)	Start DB2 Trace Request input panel
LOCKE	Lock Contention by User Detail display
EXPLAIN	RxD2 EXPLAIN for the current or last-executed dynamic or static SQL statement (displayed at the bottom of the base section), if RxD2 is installed **Note:** Access is possible to remote DB2 subsystems only if connected with DDF to a local DB2 (in the same MVS system as the TS). A qualifier panel is first displayed primed with the SQL text and query number 1. Your user ID is primed as the PLAN_TABLE owner. You can change these specifications before executing the EXPLAIN.
PT	RxD2 PLAN_TABLE display of existing EXPLAIN data for the current or last-executed static SQL statement (displayed at the bottom of the base section), if RxD2 is installed **Note:** Access is possible to remote DB2 subsystems only if connected with DDF to a local DB2 (in the same MVS system as the TS). A qualifier panel is first displayed primed with the query number (statement number) and program (DBRM or package). Your user ID is primed as the PLAN_TABLE owner. You can change this specification before proceeding to the actual EXPLAIN data.
CICSE	CICS RCT Entry Detail display (for CICS threads only)
CMRTASK	MAINVIEW for CICS Task Expand display for the task related to this DB2 thread, if MAINVIEW for CICS is installed (for CICS threads only)
DREGN	MAINVIEW for IMS Detail Region display for the region related to this DB2 thread, if MAINVIEW for IMS is installed (for IMS threads only)
ENV	DUSER Environmental Indicators display section
ELAPSED	DUSER Elapsed Time Analysis display section (accounting classes 2 and 3 only)

SQLCOUNTS	DUSER SQL Statement Execution Counts display section
BPOOL	DUSER Buffer Pool Activity display section
LOCKS	DUSER Lock Activity display section
PRLL	DUSER Parallelism display section
RTN	DUSER Routines display section (only if the transaction has issued stored procedure calls or user-defined functions or has been invoked by a trigger)
DDF	DUSER DDF Summary display section (only if there is DDF activity for the displayed thread)

You also can tab to any one of several defined lines and press ENTER to transfer to the following related displays.

From the Base section:

Line Identifier	**DUSER Section Transferred To**
CURRENT	ENV
ELAPSED TIME	ELAPSED
TOTAL SQL	SQLCOUNTS
GETPAGES	BPOOL
SYNC I/O (PRLL=nn)	PRLL
UPDATES/COMMIT	LOCKS

Any other position transfers to UTRAC.

Thread Identifiers and Status Summary (Base Section)

The following areas are displayed on the initial screen where the most critical data is summarized.

Area 1 - Identifiers and Status

This area shows timestamps, status, and identifiers.

```
CURRENT........11:07:13.53 PLAN..............DSNESPRR TYPE..............ALLIED
START..........10:58:49.39 AUTHID............BOLHHH4 CONNECT..........TSO/TSO
ELAPSED........00:08:24 ORIG PRIM AUTH.....BOLHHH4 CORR ID.....BOLHHH4
STATUS..............IN-DB2 COMMITS..................0 ROLLBACKS.............0
```

where

CURRENT
: Current time.

START
: Start time of transaction.

ELAPSED
: Elapsed time for this task. If accounting trace level one is not active, this is the total elapsed time to date for this task.

  For TSO, it is the elapsed transaction time (since the ENTER key was pressed). If accounting trace level one is active, this is the elapsed time since this thread was established at the plan level.

  For CICS and IMS, it is the time since the transaction thread issued its first SQL. If accounting trace level one is active, this is the elapsed time since this thread was established at the plan level.

STATUS
: Indicates current status of this user. This field can contain one of the following:

IN-APPL	User is active in the application.
IN-DB2	User is active in DB2.
ROLLING BACK	Thread has abended.
NOT IN PLAN	User is connected with DB2 but not at plan level.
UNKNOWN	Thread status is unknown.
STOR. PROC.	A Stored Procedure is being executed.
WAIT ST. PROC	Waiting to schedule a Stored Procedure.

PLAN
: Plan name.

AUTHID
: Authorization ID.

ORIG PRIM AUTH
: Original primary authorization ID.

COMMITS
Number of commits.

TYPE
Type of thread, which can be one of the following:

ALLIED	Standard thread
ALLIED DISTR	Thread requesting distributed data (requestor)
DBAT	Database access thread (distributed server)

CONNECT
Subsystem attach name from where this user is making DB2 requests. The connection name is followed by the connection type where available.

TSO/TSO	TSO Foreground and Background
BATCH	Batch, no type specified
UTILITY	Utility, no type specified
DB2 CALL/CAF	Call Attach Facility
cics id/CICS	CICS Attach
ims id/MPP	IMS Attach—MPP
ims id/BMP	IMS Attach—BMP
ims id/TBMP	IMS Attach—Transaction BMP
ims id/CTL	IMS Attach—Control Region
db2 id	DB2 Internal, no type specified
jobname/DLIB	DL/I Batch
SERVER/APL	Distributed, Application-Directed Access
SERVER/SYS	Distributed, System-Directed Access
xxxxx/SYS	Distributed, System-Directed Access, where xxxxx is the connection name of the thread at the requesting location
jobname/TRRS	RRSAF (Recoverable Resource Manager Services Attachment Facility) (DB2 Version 5 and later)
jobname/UTIL	DB2 utilities subtask connection (DB2 Version 5 and later)

The connection type determines the contents of the thread ID, authorization ID, and correlation ID fields.

CORRID
Correlation ID.

ROLLBACKS
Number of implicit and explicit ROLLBACKs performed.

Area 2 - Runtime Analysis

This area shows runtime analysis of elapsed and CPU time with a graphic display.

```
-------------------------------------------------------------------------------
RUNTIME ANALYSIS   IN DB2     IN APPL.      TOTAL      %IN DB2(=)     TOTAL(*)
----------------   --------   --------   --------     0 ...25...50...75..100%
ELAPSED TIME       00:08:23     718 ms   00:08:24     | ===================* |
CPU TIME           00:01:22     123 ms   00:01:22     | ===                   |
DB2 WAIT TIME         20 s                            | <                     |
```

where

ELAPSED TIME:

TOTAL
: Total elapsed time. The percent of total elapsed time is always 100 percent. This measure is included to establish the scale.

IN DB2
: Elapsed time spent in DB2 processing (accounting level 2).

IN APPL.
: Total elapsed time minus the time spent in DB2 (accounting level 2).

CPU TIME:

TOTAL
: TCB time minus the thread start time for the thread subtask processing the user's request.

  For CICS, this is a relative cost for the DB2 activity for this transaction. Any CICS CPU time for this transaction is not included in this value. In the event of thread reuse, this value can be distorted, as it is a total time for the thread subtask, not per CICS transaction.

IN DB2
: CPU time spent in DB2 processing (reported by DB2 only if accounting level 2 trace is active).

IN APPL.
: Total CPU time minus the time spent in DB2 (accounting level 2).

Note: This value is N/A for Database Access Threads (DBATs) and parallel CPU subtasks, since they operate under an SRB for which CPU time is not available.

DB2 WAIT TIM
: Elapsed time spent in DB2 processing. (This field is zero unless accounting level 3 is active.)

Note: It is possible under some circumstances that DB2 wait time can exceed total elapsed time. This is possible because DB2 adds all wait times for all processes. If the waits for concurrent processes overlap, this time is counted multiple times.

Area 3 - Activity/SQL Statement Analysis

This area shows the most important activity indicators and SQL statement information.

```
- - - - - - ACTIVITY - - - - - -
TOTAL SQL.......................2
GETPAGES..................416,803
SYNC READS (PRLL=00) .........147
PREFETCH PAGES READ.........1,051
UPDATES/COMMIT................0.0
BFR HIT RATIOS:...VP=100%,HP=100%
- - - - - - - - - - - - - -SQL STATEMENT ANALYSIS - - - - - - - - - - - - - - -
STATEMENT #:    193                   STATEMENT TYPE:  OPEN
ACTIVE IN DB2                CPU TIME: 1,897 ms     ELAPSED TIME: 00:01:06
Package/DBRM: DSNESM68  (DYNAMIC)           PLAN ISOLATION LEVEL: RR
PROCEDURE/UDF/TRIGGER:  DSN8SPAS_TEST
SELECT * FROM LONG_SQL ;
```

where

TOTAL SQL
: Total number of SQL statements executed.

GETPAGES
: Number of GETPAGE requests. This field counts conditional and unconditional requests (both successful and unsuccessful).

SYNC READS
: Number of synchronous read I/Os performed on behalf of this user.

(PRLL=nn)
: Number of parallel groups that were executed.

PREFETCH PAGES READ
: Total number of pages read by all prefetch performed for this request. This value includes all pages read by list, sequential, and dynamic prefetch.

UPDATES/COMMIT
: Number of SQL update type statements (INSERTs, UPDATEs, DELETEs) per commit statement.

BFR HIT RATIOS:

This field includes the hit ratios for both the virtual pool and the corresponding hiperpool.

VIRTUAL POOL HIT RATIO

This value is a measure of buffer pool performance. A high hit ratio means that a high percentage of reads are satisfied from the buffer pool without having to access external storage.

Note: Heavy prefetch activity can drive this value close to 0.

A pure random hit ratio cannot be calculated since the getpage count in the DB2 accounting record includes both random and sequential activity.

The hit ratio is computed as follows:

```
((A–B) / A) x 100
```

where

A Number of GETPAGE requests

B Number of synchronous reads and asynchronous pages read

HIPERPOOL HIT RATIO

This value is a measure of performance of the hiperpool. A high hit ratio means that a high percentage of reads are satisfied from the hiperpool. A hit ratio of 100% indicates that MVS has not stolen any of the expanded storage allocated to the hiperpool.

The hit ratio is computed as follows:

```
((A–B) / A) x 100
```

where

A Is the total number of successful reads from the hiperpool

B Is the number of hiperpool read failures

SQL Statement Analysis:

STATEMENT #:
Shows the following information about the SQL statement currently being executed:

- The statement number, as it appears in the DBRM or SYSIBM.SYSSTMT table

ACTIVE IN DB2
Shows that the current SQL statement being executed is actively processing in DB2 code. Also the CPU and elapsed time for this SQL statement are shown.

If the statement is not processing in DB2 code, *NOT ACTIVE IN DB2* is shown and the CPU and elapsed times are not present.

Package/DBRM:
Shows the following information about the SQL statement currently being executed:

- The package or the Database Request Module (DBRM) name that contains the SQL statement
- The word, DYNAMIC, if the statement is dynamic SQL

STATEMENT TYPE:
Shows the following information about the SQL statement currently being executed:

- The SQL statement type, as defined in the DSNXRDI member of the DB2 macro library

CPU TIME:
CPU time the SQL statement currently executing in DB2 code has consumed.

If this SQL statement is no longer executing in DB2 code, this time is not shown. This is done since it becomes impossible to distinguish between the time spent in DB2 code and time spent in application code.

This time is calculated by subtracting the CPU time when the SQL statement started executing in DB2 code from the current CPU time for the thread.

ELAPSED TIME:
Elapsed time that the SQL statement currently executing in DB2 code has spent.

If this SQL statement is no longer executing in DB2 code, this time is not shown. This is done since it becomes impossible to distinguish between the time spent in DB2 code and time spent in application code.

This time is calculated by subtracting the time of day when the SQL statement started executing in DB2 code from the current time of day.

PLAN ISOLATION LEVEL:
Isolation level of the plan.

For DB2 3.1, it can be

RR	Repeatable Read
CS	Cursor Stability

For DB2 4.1 and later, it can be

RR	Repeatable Read
CS	Cursor Stability
UR	Uncommitted Read
RS	Read Stability
RSX	Read Stability with X-Lock (DB2 5.1 and later)
RRX	Read Repeatable with X-Lock (DB2 5.1 and later)

PROCEDURE/UDF/TRIGGER:
Name of the stored procedure, user-defined function, or trigger being used.

Note: This line is displayed only if the user connection has issued stored procedure calls or user-defined functions or has been invoked by a trigger.

SQL statement (unlabeled)
Text of the SQL statement currently being executed. You can scroll down to see all of the statement. The maximum size that can be displayed is 4K bytes for static SQL and 32K bytes for dynamic SQL.

Note: The SQL text is displayed only if you have authorization to view it. If you are not authorized, a message is displayed in place of the SQL text informing you that the text display is suppressed by user authorization.

Area 4 - Key Indicators

This area shows the six most important key indicators of failures or degradation.

```
- - - - - KEY INDICATORS  - - - - - - -
SQL: DYNAMIC(PREPARE)=     1
I/O RSP: SYNC=    45 ms, ASYNC=   107 ms
```

A maximum of six key indicators are displayed in this area. They are selected in the following order of importance.

- These indicators show the cause of degradation and are highlighted:
  - **STORED PROC. FAILED (reason) = nnnnnn**

    Indicates the number of times a Stored Procedure call failed for one of the following reasons:

ABEND	Stored Procedure call terminated abnormally.
REJECT	Stored Procedure call was rejected.
TIMEOUT	Stored Procedure call was timed out while waiting to be scheduled.

    Action: N/A

    Field: QXCALLAB, QXCALLRJ, QXCALLTO
  - **RID FAILURE - STORAGE**

    Indicates that RID list processing for this unit of work failed because not enough storage was available.

    Action: Review the storage allocations specified when DB2 was installed.

    Field: QXNSMIAP
  - **RID FAILURE - NUMBER OF RIDS**

    Indicates that RID list processing for this unit of work failed because one of the internal limits was exceeded.

    The internal limits include the physical limit of the number of RIDs a RID list can contain and internal thresholds for the retrieval and manipulation of RIDs.

    Action: N/A

    Field: QXMRMIAP
  - **CLAIM FAILURE**

    Indicates that CLAIM processing failed for this unit of work.

    Action: N/A

    Field: QTXACLUN

– **DRAIN FAILURE**

Indicates that DRAIN processing failed for this unit of work.

Action: N/A

Field: QTXADRUN

– **PARALLEL CPU FALLBACK - reason**

Indicates that parallel CPU processing was turned off and sequential mode was used.

Possible causes indicated by *reason* are as follows:

NO ENCLAVE	The MVS ENCLAVE feature is not supported on this machine (MVS 5.2 or higher is required).
RLF	The Resource Limit Facility has limited CPU parallelism for some SELECT statement.

Action: N/A

Field: QXDEGENC, QXRLFDPA

– **PARALLEL I/O FALLBACK - reason**

Indicates that parallel I/O processing was turned off and sequential mode was used.

Possible causes indicated by *reason* are as follows:

STORAGE	Storage shortage or insufficient buffers in the buffer pool.
ESA SORT	ESA sort feature is not installed on this machine.
AMBIG. CURSOR	Cursor in use is capable of UPDATE or DELETE.

Action: N/A

Field: QXDEGBUF, QXDEGESA, QXDEGCUR

– **SYSPLEX PRLL FALLBACK - reason**

Indicates that sysplex parallel processing was disabled and the parallel group was executed on a single DB2 (DB2 Version 5 and later only).

Possible causes indicated by *reason* are as follows:

COORDINATR=NO	Bound COORDINATOR=YES, but run on COORDINATOR=NO system.
ISOLAT..RR/RS	PLAN/PACKAGE was bound with isolation level of repeatable read.
BYPASS-BUFFER	Bypassed due to insufficient buffer pool storage.

Action: N/A

Field: QXCOORNO, QXISOOR, QXXCSKIP

– **PARALLEL I/O REDUCED DEGREE - nnnnnn**

Indicates that parallel I/O processing was reduced from the planned degree to a lesser degree because of insufficient storage or insufficient buffers in the buffer pool.

where

nnnnnn Number of times this has occurred

Action: If this number is not zero, consider increasing the size of the buffer pool or specifying a different buffer pool for the table space.

Field: QXREDGRP

– **INCREMENTAL BINDS = nnnnnn**

Indicates the number of incremental binds that this unit of work performed.

This indicates that the plan/package had become invalid for some reason, such as an ALTER on an index or table.

Action: Nothing needs to be done for this plan, but you may want to explicitly bind any plans whose tables/indexes are being altered. Incremental binds can have a significant impact in an online transaction system.

Field: QXINCRB

– **THREAD NOT IN PLAN**

Indicates that the user has established a connection to DB2, but that connection is currently not complete.

To complete this connection, the selected attachment facility (TSO, CICS, IMS, or CAF) must issue a CREATE THREAD to allocate a plan and obtain the resources necessary for that plan.

Action: N/A

Field: N/A

– **THREAD WAITING TO SCHEDULE STORED PROC.**

Indicates that this unit of work has issued a SQL CALL statement and is waiting for the Stored Procedure to be scheduled.

Action: N/A

Field: QW0148FL (bit QW0148SQ)

– **TOTAL DDL = nnnnnn**

Indicates the number of Data Definition Language (DDL) statements performed by this unit of work.

DDL statements, such as CREATE TABLE, can have a significant impact on system performance. To perform DDL operations, exclusive locks need to be obtained against the DB2 catalog.

Action: In an online transaction system, avoid designing transactions that use DDL operations.

Field: QXCRTAB, QXCRINX, and so on

– **TIME SINCE LAST COMMIT = ttttttt**

For threads that have updated DB2 resources, this reports the amount of time that has elapsed since the start of the thread or since the last commit was issued.

This information is of value when deciding whether a thread should be cancelled. The longer the thread has been executing, the longer the rollback process will run.

Action: N/A

- The following indicators are informational in nature and are not highlighted:

  – **GRANTS / REVOKES = nnnnnn**

  Indicates the number of GRANT and/or REVOKE SQL statements issued by this unit of work.

  Action: N/A

  Field: QXGRANT, QXREVOK

  – **LOCK TABLE = nnnnnn**

  Indicates the number of LOCK TABLE SQL statements issued by this unit of work.

  Action: Use LOCK TABLE carefully. It means that this unit of work owns exclusive control of the table, allowing no concurrent access.

  Field: QXLOCK

  – **LOCK ESCALATIONS = nnnnnn**

  Indicates the number of times that the total locks per table have exceeded the installation limit for this unit of work. When this limit is exceeded, DB2 promotes the current page locks to a single table space lock of the same type.

  Action: Lock escalation usually indicates that the application has encountered an exceptional condition. If this occurs frequently, the design of the application should be reviewed.

  Field: QTXALES, QTXALEX

  – **PARALLEL I/O CONDITIONAL GETPAGE FAILURE**

  Indicates that a conditional GETPAGE request was not satisfied for this buffer pool. This applies only to parallel I/O that is conditional in nature.

  When this condition occurs, it indicates that a prefetch operation failed to retrieve a page before the application required it.

  Action: N/A

  Field: QBACNGT

  – **SQL: SELECT=nnnnnn, FETCH=nnnnnn**

  Summary of the number of SQL SELECT and FETCH statements issued by this unit of work.

  In a DDF environment, the number of FETCH statements may not truly reflect the number of FETCHes issued by the application due to internal DDF processing.

  Action: N/A

  Field: QXSELECT, QXFETCH

– **SQL: INS=nnnnnn, UPD=nnnnnn, DEL=nnnnnn**

Summary of the number of SQL INSERT, UPDATE, and/or DELETE SQL statements issued by this unit of work.

Action: N/A

Field: QXINSRT, QXUPDTE, QXDELET

– **SQL: DYNAMIC(PREPARE)=nnnnnn**

Summary of the number of PREPARE SQL statements issued by this unit of work. Each PREPARE statement is equivalent to one dynamic SQL statement.

In a DDF environment, the number of PREPARE statements may not truly reflect the number of dynamic SQL statements issued by the application due to internal DDF processing.

Action: N/A

Field: QXPREP

– **THREAD RUNNING A STORED PROCEDURE**

Indicates that this unit of work has issued a SQL CALL statement and the Stored Procedure is currently being executed.

Action: N/A

Field: QW0148FL (bit QW0148SN)

– **I/O RSP: SYNC= time, ASYNC= time**

Provides an indication of the average I/O response times this unit of work is experiencing for synchronous and asynchronous requests.

Action: N/A

Field: For synchronous requests:
QWACARNE, QWACAWTI

For asynchronous requests:
QWACARNR, QWACARNW, QWACAWTR, QWACAWTW

– **LOCK SUSPENSIONS = nnnnnn**

Number of times this unit of work was suspended due to a lock or latch conflict with another unit of work.

This number should be small, ideally zero.

Action: N/A

Field: QTXASLOC, QTXASLAT, QTXASOTH

– **PARALLEL MAINTASK, SUBTASKS = nnnnnn**

Indicates that this unit of work is the primary, or originating unit of work in a group supporting a query or utility using parallel tasks. SUBTASKS shows the number of subtask units of work that were created to support this query or utility.

Action: N/A

Field: QWACPACE, QWACPCNT

– **PARALLEL - SUBTASK**

Indicates that this unit of work was created in support of a query or utility using parallel tasks.

Action: N/A

Field: QWACPACE

– **SYSPLEX PARALLELISM - COORDINATOR/ASSISTANT**

Indicates that a query is being processed across more than one DB2, where this DB2 is either the coordinator or an assistant (DB2 Version 5 and later only).

Action: N/A

Field: QWDA

– **NUMBER OF DISTRIBUTED LOCATIONS = nnnnnn**

Number of separate DDF locations accessed by this unit of work.

Action: N/A

Field: N/A

– **RID LIST PROCESSING USED = nnnnnn**

Number of times RID list processing was used for this unit of work.

During RID list processing, DB2 produces a list of candidate record IDs from an index. The resulting RID list can be used to efficiently retrieve the qualifying rows.

Action: N/A

Field: QXMAIP

Environmental Indicators

The Environmental Indicators section shown in Figure 29 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the ENV expand button
- Tabbing to the CURRENT field in the base section and pressing ENTER

```
- - - - - - - - - - - - - ENVIRONMENTAL INDICATORS - - - - - - - - - - - - -
JOB NAME.......BOLHHH4    STEP NAME......IKJDB2G    PROC STEP.....T021T004
LUWID.........USBOOL01.LUDB2G.AC1E9056AFF70001      LUWID TOKEN........174
RLF TABLE ID..NOT ACTIVE                            PROGRAM NAME..DSNECP10

        - - - - - - - - - - CICS CONNECTION - - - - - - - - - - -
TRAN...D8CS                       APPLID.......CICS332B
TERM...       TASK.....37         USERID.......             PROGRAM...DFHEDFX
DPMODE.HIGH   ROLBE...YES          THREAD TYPE..ENTRY        RCT TABLE DSNCRCTH
STATUS IN CICS...KCCOMPAT         CICS CPU TIME........72 ms
ACCOUNTING TOKEN......(TOKENE NOT SPECIFIED)

---or--

       - - - - - - - - - - IMS CONNECTION- - - - - - - - - - - - -
PST.....0001              REGION TYPE...MPP         PSB NAME...DSN8IC22
TRAN....DSN8ICS           CLASS...........1         PROGRAM....DSN8IC22
CONTROL REGION NAME...IMS31X                        LTERM......- none -
STATUS IN IMS: I/ACTV-USR

---or--

        - - - - - - - - - UTILITY CONNECTION- - - - - - - - - - -
UTILITY.......STOSPACE    PHASE NAME....STOSPACE    REC COUNT.....     n/a
UTILITY QUALIFIER.....TEST.UTILITY
```

Figure 29. DUSER Environment (ENV) Section

where

JOB NAME
: Name of the job being executed, TSO user ID, or started task name.

LUWID
: Logical unit of work ID.

RLF TABLE ID
: Resource Limit Facility (RLF) table ID. If the Resource Limit Facility is inactive, INACT is shown instead of a table ID.

STEP NAME
: Step name of the job being executed, logon proc name, started task ID, or blank.

PROC STEP
: Proc name, within a step, of the job being executed, or terminal ID. If no procedure is being executed, this field is blank.

LUWID TOKEN
This token is an alternative to the LUWID to identify a specific DB2 thread. The token is a 1- to 5-digit decimal number assigned by DB2 as each thread is created. The token is unique per DB2 subsystem, but not necessarily unique across subsystems.

This token is used in various DB2 commands, such as the DISPLAY THREAD or CANCEL THREAD commands.

PROGRAM NAME
Name of the application program currently being processed by this user.

Note: This program name is shown only for users that are connected with the batch, TSO, or CAF interfaces. The program name for IMS or CICS users is shown in the respective subsection.

CICS CONNECTION
This section is displayed only if the thread represents a CICS user.

TRAN
CICS transaction name.

TERM
Identifies the CICS terminal (if any) for this thread.

DPMODE
LOW|EQ|HIGH. The dispatching mode for this transaction as specified by the DPMODE parameter in the RCT table definition.

STATUS IN CICS:
For a CICS transaction, the following states could be displayed:

IN ATTACH — A thread is being created following the first SQL call by a CICS transaction.

NO ATTACH — No CICS Resource Control Table (RCT) was found.

NOT ACTIVE — User is no longer active within the DB2/CICS attachment.

TERMINATE — User is no longer active in CICS and is currently in termination phase in DB2.

Note: If a protected thread is being used, the user still appears for a short period (30 seconds) because DB2 is awaiting the next transaction.

WAIT ATTCH — DB2 thread is awaiting the next SQL request.

For CICS/ESA Release 3.1 and later, the status displayed is the resource type that the CICS task is waiting for, as determined by the CICS dispatcher domain. The complete list of resource types can be found in the *CICS/ESA Problem Determination Guide*. Following is a partial list, based on the resource type prefix.

DLxxxxxx — CICS task has a DLI/DBCTL wait.

DSxxxxxx — CICS task is waiting because the maximum task limit has been reached.

EKCxxxxx — CICS task has a single ECB wait.

FCxxxxxx — CICS task has a file control wait.

ICxxxxxx — CICS task has an interval control wait.

IRxxxxxx	CICS task has an interregion/terminal wait.
JCxxxxxx	CICS task has a journal control wait.
KC_ENQxx	CICS task has an enqueue wait.
KCCxxxxx	CICS task has a task control wait.
SMxxxxxx	CICS task has a Storage Manager wait.
TDxxxxxx	CICS task has a transient data wait.
TSxxxxxx	CICS task has a temporary storage wait.
XMxxxxxx	CICS task is waiting because the maximum task limit has been reached.

For CICS Release 2.1 and lower, these states could be displayed:

CICS-ACTIV	CICS task is the currently active task.
CICS-EVENT	CICS task is waiting for a CICS event.
ENQ-RES	CICS task is waiting for the availability of a resource.
LIST-EVENT	CICS task is waiting for multiple events.
NON-DISP	CICS task is non-dispatchable.
SING-EVENT	CICS task is waiting for a single event.
SRB-MODE	CICS task is in SRB mode.
TERM-CNTL	CICS task is waiting for terminal control.
UNKNOWN	Status is unknown.
WAIT-ABEND	CICS task is waiting to abend (dump control).
WAIT-AMAX	CICS task is waiting because of Active Maximum Tasks (AMAX).
WAIT-BUFF	CICS task is waiting for buffer.
WAIT-CMAX	CICS task is waiting because of Class Maximum Tasks (CMAX).
WAIT-CONV	CICS task is waiting for a conversational iteration.
WAIT-CPU	CICS task is waiting for the CPU resource.
WAIT-DLI	CICS task is waiting for DL/I thread.
WAIT-EXCL	CICS task is waiting for exclusively controlled record.
WAIT-ICP	CICS task is waiting for interval control.
WAIT-IO	CICS task is waiting for file control.
WAIT-LSR	CICS task is waiting for LSR.
WAIT-PAGID	CICS task is waiting on asynchronous page I/O.
WAIT-PCA	CICS task is in PCA wait (SVS only).
WAIT-RDSTR	CICS task is waiting for read-only string.
WAIT-STALL	CICS task is waiting to be stall purged.
WAIT-STORG	CICS task is waiting for storage control.

WAIT-TCNTL CICS task is waiting for task control.

WAIT-TSTOR CICS task is waiting for temporary storage.

WAIT-VSAM CICS task is waiting for VSAM string.

ACCOUNTING TOKEN
CICS correlation token, made up of network name, LU name, and uniqueness value.

TASK
Identifies the CICS task number for this thread.

ROLBE
YES|NO. Indicates whether synchronization point rollback is to be performed in the event of a DB2 deadlock as stated in the ROLBE parameter in the RCT table definition.

APPLID
VTAM APPLID for CICS.

USERID
Eight-character user ID, if available. Otherwise the 3-character operator ID.

THREAD TYPE
POOL|ENTRY|CMD. Indicates whether the thread in use is a POOL thread, an ENTRY thread, or a command thread.

CICS CPU TIME
Amount of CPU time consumed by a DB2 CICS transaction while under control of the CICS system. This information is available only when CMP performance statistics are being collected.

PROGRAM
Indicates the program name for this transaction.

RCT TABLE
Indicates the current Resource Control Table (RCT) in use.

IMS CONNECTION
This section is displayed only if the thread represents an IMS user.

PST
Number of the IMS dependent region that is processing this transaction.

TRAN
IMS transaction name.

CONTROL REGION NAME
Name of the IMS control region.

STATUS IN IMS:
For an IMS transaction, the following states could be displayed:

I/ACTV-DB2	IMS transaction is active in DB2.
I/ACTV-DLI	IMS transaction is active in DL/I.
I/ACTV-USR	IMS transaction is active in the application program.
I/IDLE	IMS region is waiting for input to process.
I/OPENING	IMS is performing the first CREATE THREAD.
I/SCHDULE	IMS is scheduling (CREATE THREAD).
I/TERMINAT	IMS region is in termination or abend.
I/WAIT-DLI	IMS transaction is waiting in DL/I.
I/WAIT-FP	IMS transaction is waiting in Fast Path.
I/WAITING	IMS region is in unidentifiable wait.
I/WAIT-L1	IMS transaction is waiting for level 1 latch.
I/WAIT-L2	IMS transaction is waiting for level 2 latch.
I/WT-OSAM	IMS transaction is waiting in OSAM.
I/WT-PI	IMS transaction is waiting in program isolation.
I/WT-QMGR	IMS transaction is waiting in Queue Manager.
I/WT-VSAM	IMS transaction is waiting in VSAM.

REGION TYPE
Type of region processing this IMS transaction. Possible values are

- MDP
- NDP
- FPU
- DBC
- BMP
- MPP

CLASS
Transaction class being processed by the region.

PSB NAME
Name of the PSB under which this IMS transaction is executing.

PROGRAM
Name of the application program currently being processed.

LTERM
Logical terminal ID at which the IMS transaction was entered. If this transaction is not terminal-related, NONE is shown.

UTILITY CONNECTION

This section is displayed only if the thread represents a utility connection.

UTILITY

Name of the DB2 utility being executed by this thread.

PHASE NAME

Name of the phase being executed by the utility under this thread.

REC COUNT

Number of records that have been processed by the utility.

Note: This count is supported for only some utilities; for example LOAD or REOEG. This field contains *n/a* for those utilities where record count is not supported.

UTILITY QUALIFIER

Sixteen-character qualifier specified by the user to uniquely identify this utility job to DB2.

Elapsed Time Analysis

The Elapsed Time Analysis section shown in Figure 30 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the ELAPSED expand button
- Tabbing to the ELAPSED TIME field in the base section and pressing ENTER

The data is displayed only if accounting class 2 or 3 is active. If accounting class 2 or 3 is not active, only the header is displayed.

```
- - - - - - - - ELAPSED TIME ANALYSIS (ACCTG CLASSES 2,3 ONLY) - - - - - - - -

CATEGORY           #EVENTS AVG/EVENT  ELAPSED  %TOTAL
----------------   ------- --------- -------- ------- 0 ...25...50...75..100%
ELAPSED TIME                                           |                    |
  IN DB2                             00:12:39   99.86 | ******************  |
  IN APPLICATION                     1,038 ms    0.13 | <                  |
 --TOTALS--                          00:12:40  100.00 | ******************* |
WAITS IN DB2 (LOCAL)                                   |                    |
  LOCK/LATCH             0      0 us     0 us    0.00 |                    |
  I/O WAIT              19     21 ms   392 ms    0.05 | <                  |
  LOG WRITE I/O          0      0 us     0 us    0.00 |                    |
  OTHER READ I/O         0      0 us     0 us    0.00 |                    |
  OTHER WRITE I/O        0      0 us     0 us    0.00 |                    |
  UNIT SWITCH EVENTS                                   |                    |
  ..COMMIT/ROLLBK        0      0 us     0 us    0.00 |                    |
  ..OPEN/CLOSE           6  8,965 ms    54 s     7.07 | *                  |
  ..SYSLGRNG             1    700 ms   700 ms    0.09 | <                  |
  ..DATASPACE MGR        4    243 ms   973 ms    0.12 | <                  |
  ..OTHER                0      0 us     0 us    0.00 |                    |
  ARCH. LOG(QIS)         0      0 us     0 us    0.00 |                    |
  ARCH.READ(TAPE)        0      0 us     0 us    0.00 |                    |
  DRAIN LOCK             0      0 us     0 us    0.00 |                    |
  CLAIM RELEASE          0      0 us     0 us    0.00 |                    |
  PAGELATCH CONT.        0      0 us     0 us    0.00 |                    |
  SPAS SERVER TCB        0      0 us     0 us    0.00 |                    |
WAITS IN DB2 (GLOBAL)                                  |                    |
  LOCKS                  0      0 us     0 us    0.00 |                    |
  MSG. PROCESSING        0      0 us     0 us    0.00 |                    |
---TOTAL WAITS---       30  1,862 ms    56 s     7.34 | *                  |
*NOT ACCOUNTED                     00:11:44   92.54 | *****************   |
```

Figure 30. DUSER Elapsed Time (ELAPSED) Section

This area displays the elapsed time, number of events, average elapsed time per event, and percent of total elapsed time for each of the following categories. The percent of total elapsed time is also displayed graphically for each of these categories.

ELAPSED TIME

This information is available if accounting class 2 is active:

IN DB2

Elapsed time spent in DB2 processing (QWACASC).

In-DB2 time is elapsed time while performing DB2 work. The DB2 time is a percentage of the total elapsed time.

Note: DB2 combines elapsed times of related processes into a single in-DB2 elapsed time value; thus the in-DB2 elapsed time may exceed the total elapsed time. When this occurs, the percent of total elapsed time is set to 101 percent.

IN APPLICATION

Total elapsed time minus the time spent in DB2 (QWACESC - QWACBSC - QWACASC).

Application time is elapsed time spent in the application while NOT performing DB2 work.

Note: DB2 combines elapsed times of related processes into a single in-DB2 elapsed time value; thus the in-DB2 elapsed time may exceed the total elapsed time. When this occurs, the in-application time is not calculated and is displayed as asterisks.

TOTALS

Total elapsed time from the first connect to DB2 to thread termination (QWACESC - QWACBSC).

The time a thread was inactive waiting for work is included in this value.

This value is not accurate for threads that do not terminate, such as a CICS conversational transaction or an IMS WFI BMP.

Note: The percent of total elapsed time is always 100 percent. This measure is included to establish the scale.

WAITS IN DB2 (LOCAL)

The elapsed time for the following DB2 wait events is available only if accounting class 3 is active, as follows:

LOCK/LATCH

Elapsed time spent in DB2 waiting for a lock or latch (QWACAWTL).

This value indicates the elapsed time the thread waited for transaction locks and latches.

This time reflects the amount of time the thread was suspended because of an incompatible lock or latch mode.

I/O WAIT

Elapsed time spent in DB2 waiting for synchronous I/O (QWACAWTI).

Most of the time included in this value is synchronous read time, but under stress conditions it can reflect synchronous write time (when immediate write threshold is reached). During heavy update activity, it also can reflect wait for synchronous log I/O.

Note: Log waits are not included in this value for DB2 6.1 and later.

OTHER READ

Elapsed time spent in DB2 waiting for read I/O, for I/O done by another thread such as sequential prefetch, sequential detection, or list prefetch (QWACAWTR).

This value is the time spent waiting for reads, which are being done under another thread, to complete. These waits may be for sequential prefetch, sequential detection, list prefetch, or for synchronous I/O done while executing a sequential prefetch operation.

Tuning Tip: Time reflected here does not reflect the duration of the I/O but simply the time the thread waited for completion of the I/O activity. If this number is high, parallel processing may assist in reducing the time.

OTHER WRITE

Elapsed time spent in DB2 waiting for write I/O done by another thread (QWACAWTW).

Tuning Tip: Time reflected here should be small, since normal checkpoint and deferred write thresholds protect threads from waiting for asynchronous write time. If this number is large, the buffer pool size or deferred write threshold may need to be adjusted.

UNIT SWITCH EVENTS

In DB2 6.1 and later, the elapsed times spent in DB2 waiting for a synchronous execution unit switch to each of the following DB2 service tasks, which are shown individually:

- Commit, abort, or deallocation processing
- Open/close data set or HSM recall
- SYSLGRNG recording
- Data space manager services (which include define, extend, delete, and reset data set, and VSAM catalog access)
- Other DB2 service tasks

In DB2 5.1 and earlier, these waits are combined into a single value.

ARCH.LOG(QIS)

Elapsed time spent in DB2 waiting for processing of archive log mode (quiesce) commands for the thread (QWACALOG or QWAXALOG in DB2 6.1 and later).

This process externalizes buffers and switches the active log data set. Time reflected here is the time the thread waited not the time for the command to complete.

ARCH.READ(TAPE)

Elapsed time spent in DB2 waiting for archive reads (QWACAWAR or QWAXAWAR in DB2 6.1 and later).

Time spent waiting for an archive tape is either for the completion of the RECOVER utility or for an application program, which has not committed, to read the archive tape in order to complete backout.

Tuning Tip: If this time is large, the application program should commit more often. It may also make sense to increase the size and number of active logs.

DRAIN LOCK

Elapsed time spent in DB2 waiting to acquire drain locks (QWACAWDR or QWAXAWDR in DB2 6.1 and later).

Processes, such as utilities that serialize events to page sets, must acquire a drain lock. This is the time spent waiting for this event.

Tuning Tip: To prevent delays, avoid running utilities during the times that heavy query activity is taking place.

CLAIM RELEASE

Elapsed time spent in DB2 waiting for claim locks to be released after a drain lock was requested (QWACAWCL or QWAXAWCL in DB2 6.1 and later).

Drainers must wait until the SQL claim count reaches zero. This is the time spent waiting for them to clear.

Tuning Tip: To prevent delays, avoid running utilities during the times that heavy query activity is taking place.

PAGELATCH CONT.

Elapsed time spent in DB2 because of page latch contention (QWACAWTP).

Accounting class 3 must be activated to obtain this time.

Tuning Tip: Page latching can be avoided by scheduling applications when there is a lower likelihood of latch contention.

SPAS SERVER TCB

Total elapsed time spent waiting for an available TCB before the Stored Procedure could be scheduled (QWACCAST).

This is the time spent waiting for an available TCB in the Stored Procedures Address Space to become available.

This time should be minimal depending on the workload to the Stored Procedures Address space.

WAITS IN DB2 (GLOBAL)

The elapsed time for the following global DB2 wait events is available only if accounting class 3 is active:

LOCK

Accumulated elapsed wait time caused by an IRLM lock suspension due to global lock contention which requires intersystem communication to resolve (QWACAWTJ).

This time is collected only when data sharing is enabled.

MESSAGE PROC.

Accumulated elapsed wait time caused by suspension for sending messages to other members in the data sharing group (QWACAWTG).

When tables in a data sharing group are CREATed, ALTERed, or DROPped in a data sharing group, intersystem messages must be sent to update the database descriptors (DBDs) in the other members' EDM pools. This is the time spent waiting for this message traffic to occur. This time is collected only when data sharing is enabled.

TOTAL WAITS

Total elapsed time for all DB2 wait events (local and global).

*NOT ACCOUNTED

Elapsed time that could not be accounted for by any DB2 measurements. This is usually some kind of MVS usage, such as DB2 being forced to wait on the MVS dispatcher.

This value is collected only if accounting classes 2 and 3 are activated and is calculated as follows:

In-DB2 Elapsed Time (QWACASC) - In-DB2 CPU (QWACAJST) - CLASS 3 WAIT

Tuning Tip: If this value is high, determine why MVS fails to dispatch DB2.

SQL Statement Execution Counts

The SQL Statement Execution Counts shown in Figure 31 section can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the SQLCOUNTS expand button
- Tabbing to the TOTAL SQL field in the base section and pressing ENTER

This section maintains counts for the individual types of SQL statements executed by this program from start-of-task.

```
- - - - - - - - - - - - SQL STATEMENT EXECUTION COUNTS - - - - - - - - - - - -
SELECT................0    LOCK TABLE..............0    CREATE............0
INSERT................0    GRANT/REVOKE............0    DROP..............0
UPDATE................0    SET CURR.SQLID..........0    ALTER.............0
DELETE................0    SET HOST VAR. ..........0
                            SET CURR.DEGREE.........0    COMMENT ON........0
PREPARE...............1    SET CURR. RULES.........0    LABEL ON..........0
DESCRIBE..............0    CONNECT TYPE 1..........0
                            CONNECT TYPE 2..........0    CREATE TEMP.......0
OPEN..................1    SET CONNECTION..........0    RENAME TBL........0
FETCH.................5    RELEASE.................0
CLOSE.................1    CALL....................0
                            ASSOCIATE LOCATOR.......0
                            ALLOCATE CURSOR.........0

** DML................8    ** DCL..................0    ** DDL............0
** REOPTIMIZED........0
                   - - - - DYNAMIC SQL CACHE COUNTS - - - -
STMT FOUND............0    KPDYN-PREP.AVOID........0    STMT DISCRD.......0
STMT NOT FOUND........0    KEEPDYN_IMPL.PREP.......0    STMT PURGED.......0
```

Figure 31. DUSER SQL Statement Execution Counts (SQLCOUNTS) Section

where

SELECT
: Number of SELECT statements executed.

INSERT
: Number of INSERT statements executed.

UPDATE
: Number of UPDATE statements executed.

DELETE
: Number of DELETE statements executed.

PREPARE
: Number of PREPARE statements executed.

DESCRIBE
: Number of DESCRIBE statements executed.

OPEN
Number of OPEN statements executed.

FETCH
Number of FETCH statements executed.

CLOSE
Number of CLOSE statements executed.

DML
The sum of all Data Manipulation Language (DML) statements executed.

REOPTIMIZED
Indicates the total number of times reoptimization occurred for a query (DB2 Version 5 and later).

LOCK TABLE
Number of LOCK TABLE statements executed.

GRANT/REVOKE
Number of GRANT/REVOKE statements executed.

SET CURR.SQLID
Number of SET CURRENT SQLID statements executed.

SET HOST VAR.
Number of SET HOST-VARIABLE statements executed. (This value does not include the contents of the special register.)

SET CURR.DEGREE
Number of SET CURRENT DEGREE statements executed.

SET CURR. RULES
Number of SET CURRENT RULES statements executed (DB2 Version 4 or above).

CONNECT TYPE 1
Number of CONNECT TYPE 1 statements executed.

CONNECT TYPE 2
Number of CONNECT TYPE 2 statements executed.

SET CONNECTION
Number of SET CONNECTION statements executed.

RELEASE
Number of RELEASE statements executed.

CALL
Number of SQL CALL statements to a Stored Procedure executed (DB2 Version 4 or above).

ASSOCIATE LOCATOR
Number of ASSOCIATE LOCATOR statements executed (DB2 Version 5 and later).

ALLOCATE CURSOR
: Number of ALLOCATE CURSOR statements executed (DB2 Version 5 and later).

DCL
: Sum of all Data Control Language (DCL) statements executed.

CREATE
: Number of CREATE statements executed.

DROP
: Number of DROP statements executed.

ALTER
: Number of ALTER statements executed.

COMMENT ON
: Number of COMMENT ON statements executed.

LABEL ON
: Number of LABEL ON statements executed.

CREATE TEMP
: Number of CREATE GLOBAL TEMPORARY TABLE statements executed (DB2 Version 5 and later).

RENAME TBL
: Number of RENAME TABLE statements executed (DB2 Version 5 and later).

DDL
: Sum of all Data Definition Language (DDL) statements executed.

Dynamic SQL Cache Counts:

The following fields are available for DB2 Version 5 and later:

STMT FOUND
Indicates the number of times a prepare request was satisfied by making a copy from the prepared statement cache.

STMT NOT FOUND
Indicates the number of times a prepare request was received but a matching statement was not found in the prepared statement cache.

KPDYN-PREP.AVOID
Indicates the number of times that a prepare was avoided when these conditions existed:

- The KEEPDYNAMIC(YES) option was used along with prepare statement caching
- DB2 still had the application process copy of the executable version of the prepared statement

KEEPDYN_IMPL.PREP
Indicates the number of times that an implicit prepare was performed when these conditions existed:

- The KEEPDYNAMIC(YES) option was used
- An open, execute, or describe of a dynamic statement occurred after a commit
- DB2 no longer had a valid copy of the executable version of the prepared statement

STMT DISCRD
Indicates the number of times that a prepared statement was discarded due to the MAXKEEPD system limit being exceeded.

STMT PURGED
Indicates the number of times that a prepared statement was purged from the cache because a drop, alter, or revoke statement was issued on a dependent object.

Buffer Pool Activity

The Buffer Pool Activity section shown in Figure 32 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the BPOOL expand button
- Tabbing to the GETPAGES field in the base section and pressing ENTER

```
- - - - - - - - - - - - - - BUFFER POOL ACTIVITY - - - - - - - - - - - - - - -
ACTIVITY                TOTAL       BP0       BP3
-------------------  --------  --------  --------
GETPAGES...........        30        25         5
SYNC READS.........        25        15        10
GETPAGES/READIO....       1.2       1.7         0
COND. GP FAILURES..         0         0         0

SEQ. PREFETCH REQS.         0         0         0
LIST PREFETCH REQS.         0         0         0
DYNAMIC PREFETCHES.         2         0         2
ASYNC PAGES READ...         0         0         0
PAGES/PREFETCH REQ.       0.0       0.0       0.0

PAGE UPDATES.......         3         2         1
IMMEDIATE WRITES...         0         0         0

HP SYNC READS......         0         0         0
HP SYNC READ FAIL..         0         0         0
HP ASYNC PAGES READ         0         0         0
HP WRITES..........         0         0         0
HP WRITE FAILURES..         0         0         0

             - - - - GLOBAL BUFFER POOL (DATA SHARING ONLY) - - - -
CF READS (BUFFER CROSS INVALIDATION)
 -DATA RETURNED....         2         -         2
 -R/W INTEREST.....         1         -         1
CF READS (DATA NOT IN BUFFER POOL)
 -DATA RETURNED....         2         -         2
 -R/W INTEREST.....         1         -         1
 -NO R/W INTEREST..         1         -         1
CF-WRITE (CHGD PGS)         2         -         2
CF-WRITE (CLEAN PG)         1         -         1
NBR UNREG PAGES....         1         -         1
NBR EXPLICIT XI....         0         -         0
NBR WRITES 2ND BP..         0         -         0
```

Figure 32. DUSER Buffer Pool (BPOOL) Section

where

GETPAGES
: Number of GETPAGE I/O requests.

SYNC READS
: Number of synchronous read I/Os.

GETPAGES/READIO
Number of GETPAGEs per synchronous READIO requests.

This ratio is only meaningful for random activity. If there is substantial asynchronous prefetch activity, review the value in ASYNC PAGES READ. You may want to calculate a total ratio including this value for a particular buffer pool. The VP HIT RATIO for the thread in the base section of the display includes both synchronous and asynchronous I/Os.

COND. GP FAILURES
Number of unsuccessful GETPAGE operations due to conditional GETPAGE requests.

SEQ. PREFETCH REQS
Number of sequential prefetch requests.

LIST PREFETCH REQS
Number of list prefetch requests.

DYNAMIC PREFETCHES
Number of dynamic prefetch requests.

ASYNC PAGES READ
Number of asynchronous pages read.

PAGES/PREFETCH REQ
The ratio of GETPAGEs per prefetch request.

PAGE UPDATES
Number of System Page Update requests done by this task. This counter is incremented by one each time a row in a page in the buffer pool is updated. It is also incremented for work file pages.

IMMEDIATE WRITES
Number of immediate (synchronous) write I/Os.

HP SYNC READS
Number of successful hiperpool synchronous reads.

HP SYNC READ FAILS
Number of unsuccessful hiperpool synchronous reads.

HP ASYNC PAGES READ
Number of hiperpool asynchronous pages read.

HP WRITES
Number of successful hiperpool writes.

HP WRITE FAILURES
Number of unsuccessful hiperpool writes.

Global Buffer Pool (Data Sharing Only):

The following fields are available if data sharing is active and has been used by this transaction.

CF READS (BUFFER CROSS INVALIDATION)
Coupling Facility READ requests required because the buffer was marked INVALID. The statistics are given for each of these circumstances:

-DATA RETURNED
Data is returned from the group buffer pool.

-R/W INTEREST
Data is not returned from the group buffer pool and a directory entry is created if it does not already exist, because another DB2 in the group has READ/WRITE interest in the page set or partition.

-NO R/W INTEREST
Data is not returned from the group buffer pool and no directory entry is created for this page, because no other DB2 in the group has READ/WRITE interest in the page set or partition. (DB2 Version 4 only)

CF READS (DATA NOT IN BUFFER POOL)
Coupling Facility READs necessary because the requested page was not found in the buffer pool. The statistics are given for each of these circumstances:

-DATA RETURNED
Data is returned from the Coupling Facility.

-R/W INTEREST
Data is not returned from the Coupling Facility and a directory entry is created if it does not already exist, because another DB2 in the group has READ/WRITE interest in the page set or partition.

-NO R/W INTEREST
Data is not returned from the Coupling Facility and no directory entry is created for this page, because no other DB2 in the group has READ/WRITE interest in the page set or partition.

CF-WRITE (CHGD PGS)
Number of changed pages written to the group buffer pool.

CF-WRITE (CLEAN PG)
Number of clean pages written to the group buffer pool. (DB2 writes clean pages for page sets and partitions defined with GBPCACHE ALL.)

NBR UNREG PAGES
Number of coupling facility requests to unregister a page. (DB2 Version 5 and later)

NBR EXPLICIT XI
Number of explicit cross-invalidations. (DB2 Version 6 and later)

NBR WRITES 2ND BP
Number of coupling facility requests to write changed pages to the secondary group buffer pool for duplexing. (DB2 Version 6 and later)

Lock Activity

The Lock Activity section shown in Figure 33 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the LOCKS expand button
- Tabbing to the UPDATES/COMMIT field in the base section and pressing ENTER

```
- - - - - - - - - - - - - - LOCK ACTIVITY  - - - - - - - - - - - - - -  - -
TIMEOUT.........................0     MAX PAGE/ROW LOCKS...............1
DEADLOCK........................0
                                      LOCK REQUEST.....................6
SUSPEND-LOCK....................0     UNLOCK REQUEST...................9
SUSPEND-LATCH...................0     QUERY REQUEST....................0
SUSPEND-OTHER...................0     CHANGE REQUEST...................8
                                      OTHER REQUEST....................0
ESCALATION(SHR).................0
ESCALATION(EXCL)................0

DRAIN REQUEST...................0     DRAIN FAILURE....................0
CLAIM REQUEST...................2     CLAIM FAILURE....................0
                    - - - - GLOBAL LOCK ACTIVITY - - - -
LOCK REQUEST....................1     XES LOCK REQUEST.................3
LOCK CHANGE REQUEST.............0     XES CHANGE REQUEST...............0
UNLOCK REQUEST..................0     XES UNLOCK REQUEST............... 1

IRLM GLOBAL SUSPEND.............0     XES GLOBAL SUSPEND...............0
FALSE CONTENTION................0

INCOMPATIBLE RETAINED...........0     NOTIFY MESSAGES SENT.............0
```

Figure 33. DUSER Locks (LOCKS) Section

where

TIMEOUT
: Timeout counts.

DEADLOCK
: Deadlock counts.

SUSPEND-LOCK
: Number of suspends because of lock conflicts.

SUSPEND-LATCH
: Number of suspends because of latch conflicts.

SUSPEND-OTHER
: Number of suspends because of other conflicts.

ESCALATION(SHR)
: Number of lock escalations to shared mode.

ESCALATION(EXCL)
: Number of lock escalations to exclusive mode.

DRAIN REQUEST
Number of drain requests

CLAIM REQUEST
Number of claim requests

MAX PAGE/ROW LOCKS
Maximum number of page or row locks held.

LOCK REQUEST
Lock request count.

UNLOCK REQUEST
Unlock request count.

QUERY REQUEST
Query request count.

CHANGE REQUEST
Change request count.

OTHER REQUEST
Other IRLM request count.

DRAIN FAILURE
Number of drain requests that were unsuccessful.

CLAIM FAILURE
Number of claim requests that were unsuccessful.

Global Lock Activity (Data sharing Only):

The following fields are available if the system is part of a data sharing group:

LOCK REQUEST
Number of LOCK requests for physical locks (P-locks).

LOCK CHANGE REQUEST
Number of CHANGE requests for physical locks (P-locks).

UNLOCK REQUEST
Number of UNLOCK requests for physical locks (P-locks).

IRLM GLOBAL SUSPEND
Number of suspensions because of IRLM global resource contention. (IRLM lock states were in conflict.)

FALSE CONTENTION
Number of suspensions caused by false contentions.

This occurs when different resource names hash to the same entry in the Coupling Facility lock table. This causes MVS XES to detect contention on the hash class; however, when MVS XES determines that there is no real conflict on the resource, the contention is called *false*.

INCOMPATIBLE RETAINED
Number of global lock or change requests denied because of an incompatible retained lock.

XES LOCK REQUEST
Number of LOCK requests (both L-locks and P-locks) propagated to MVS XES synchronously (under the user's execution unit).

XES CHANGE REQUEST
Number of CHANGE requests (both L-locks and P-locks) propagated to MVS XES synchronously (under the user's execution unit).

XES UNLOCK REQUEST
Number of resources propagated to MVS XES synchronously (under the user's execution unit) from UNLOCK requests (both L-locks and P-locks).

XES GLOBAL SUSPEND
Number of suspensions because of MVS XES global resource contention. (MVS XES lock states were in conflict but IRLM lock states were not.)

NOTIFY MESSAGES SENT
Number of NOTIFY messages sent to other members of this data sharing group.

Parallelism

The Parallelism section shown in Figure 34 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the PRLL expand button
- Tabbing to the PRLL=nn field in the base section and pressing ENTER

Note: With DB2 3.1, the section header reads: I/O PARALLELISM.

In DB2 5.1 and later, this also includes utility parallel tasks.

```
- - - - - - - - - - - - - - - PARALLELISM  - - - - - - - - - - - - - - - - - -
MAXIMUM DEGREE.................2        FALLBACK - NO BUFFER............1
GROUPS EXECUTED................3        FALLBACK - NO ESA SORT..........0
-- PLANNED DEGREE..............1        FALLBACK - AMBIG. CURSOR........1
-- REDUCED DEGREE..............2

PARALLEL TASKS.................3        FALLBACK - NO ENCLAVE...........0
CORRELATION TOKEN.....X'00000000'        FALLBACK - RLF LIMITED..........NO
                        - - - - SYSPLEX - - - -
COORDN/ASSISTANT...........COORDN        FALLBACK - NO COORDN............1
PRLL COORDN NAME................         FALLBACK - ISOL RR/RS...........2
MAXIMUM MEMBERS................2        REDUCED  - VP SHORTAGE..........0
INTENDED PRLL GROUPS...........0
QUERY REFORMULATED (ENV)........0        QUERY REFORMULATED (BP).........0
```

Figure 34. DUSER Parallelism (PRLL) Section

where

MAXIMUM DEGREE
: Maximum degree of parallelism achieved among the parallel groups. This field indicates the extent to which queries were processed in parallel.

GROUPS EXECUTED
: Total number of parallel groups executed.

PLANNED DEGREE
: Total number of parallel groups that have a planned degree greater than one and were successfully executed at the planned degree.

REDUCED DEGREE
: Total number of parallel groups that have a planned degree greater than one, but were processed at a lesser parallel degree because of a storage shortage or contention on the buffer pool.

  If this field is not zero, consider increasing the size of the current buffer pool or reassigning the table space to another buffer pool.

FALLBACK - NO BUFFER
: Total number of parallel groups that have a planned degree greater than one, but fell back to sequential mode because of storage shortage or contention on the buffer pool.

FALLBACK - NO ESA SORT
Total number of parallel groups that fell back to sequential mode due to lack of ESA sort support.

FALLBACK - AMBIG. CURSOR
Total number of parallel groups that fell back to sequential mode because the cursor is ambiguous (may be used for UPDATE or DELETE).

PARALLEL TASKS
Total number of subtasks that were created to support parallel tasks for this query or utility. (Available only if accounting class 1 is active.)

CORRELATION TOKEN
For subtasks created to support a parallel query or utility, this field contains the correlation token of the originating task. This token is equal to the address of the Agent Control Element (ACE) of the originating task. This token can be used to correlate parallel subtask records with the records of the originating task. This field is set to zeros for the originating task. (Available only if accounting class 1 is active.)

FALLBACK - NO ENCLAVE
Total number of parallel groups executed in sequential mode because MVS/ESA enclave services were not available.

FALLBACK - RLF LIMITED
YES|NO. Indicates whether query parallelism is disabled by the Resource Limit Facility (RLF) for at least one dynamic select statement in this thread.

Sysplex Parallelism:

The following fields are available for DB2 Version 5 and later:

COORDN/ASSISTANT
Indicates that a query is being processed across one DB2 (coordinator) or more than one DB2 (assistant).

PRLL COORDN NAME
Parallel coordinator name of the DB2 member that received the query for processing in a sysplex.

MAXIMUM MEMBERS
Indicates the maximum number of DB2 members that participated in the processing of a query.

INTENDED PRLL GROUPS
Indicates the total number of parallel groups that were intended to run across the data sharing group. This value is only incremented by the coordinator member at run time.

QUERY REFORMULATED (ENV)
Total number of parallel groups for which DB2 reformulated the parallel portion of the access path because the sysplex configuration at run time was different from the sysplex configuration at bind time.

This counter is incremented only by the parallelism coordinator at run time.

(DB2 6.1 and later)

FALLBACK — NO COORDN
Indicates the total number of parallel groups executed on a single DB2 (no sysplex).

FALLBACK — ISOL RR/RS
Indicates the total number of parallel groups executed on a single DB2 member due to repeatable-read or read-stability isolation (no sysplex).

REDUCED — VP SHORTAGE
Indicates the number of times that the parallelism coordinator had to bypass a DB2 when distributing tasks because there was not enough buffer pool storage on one or more DB2 members.

QUERY REFORMULATED (BP)
Total number of parallel groups for which DB2 reformulated the parallel portion of the access path because there was not enough buffer pool resource.

This counter is incremented only by the parallelism coordinator at run time.

(DB2 6.1 and later)

DDF Summary

The DDF Summary section shown in Figure 35 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the DDF expand button

This section is available only if there is DDF activity for the displayed thread.

Note: There can be multiple locations per thread and also multiple conversations per location.

```
- - - - - - - - - - - - - - - - DDF SUMMARY - - - - - - - - - - - - - - - - -
CURRENT LOCATION: DB2A    (ALLIED DIST REQUESTER)
  WORKSTATION USER ID...bolbpl2          WORKSTATION NAME..
  WORKSTATION TRANSACTION ID...db2bp.exe

  MVS WLM SERVICE CLASS NAME......DB2JWLM

REMOTE                                                        FROM         TO
  LOCATION:         DB2J
  REMOTE PROD-ID:   DSN06010
  DB AGENT CPU.............   15 ms
  ELAPSED LOCAL............  945 ms
  ELAPSED REMOTE...........  491 ms     MESSAGES                1          1

  CONVERSATION ID:  X'7F6893A8'
      STATUS                    INACTIVE  SESSION ID       X'F077F7F6632FA4DE'
      LAST VTAM ACTIVITY            SEND  TIME OF LAST MESSAGE    14:36:55
```

Figure 35. DUSER DDF Summary (DDF) Section

where

CURRENT LOCATION
: Current 16-character location name.

WORKSTATION USER ID:
: End user's workstation user ID. This may be different from the AUTHID used to connect to DB2.

  This field contains blanks if the client did not supply this information.

  Note: This field is not displayed if the user is not a workstation client.

WORKSTATION TRANSACTION ID:
: Transaction or application name that the end user is running. This field identifies the application that is currently running (e.g., ORDER_UPDATE), rather than the product that is being used to run the application (e.g., CICS/6000).

  This field contains blanks if the client did not supply this information.

  Note: This field is not displayed if the user is not a workstation client.

WORKSTATION NAME:
: Name of the end user's workstation.

  Note: This field is not displayed if the user is not a workstation client.

MVS WLM SERVICE CLASS NAME
The MVS workload manager (WLM) service class name. This field is used only for database access threads on MVS 5.2 or later. (DB2 5.1 and later)

Note: The WLM service class determines the MVS WLM priority of the work performed by the database access thread.

REMOTE LOCATION
Location name of the remote site with which the information is associated.

REMOTE PROD-ID
Product ID of the remote location.

DB AGENT CPU
Database access agent CPU time at the remote site.

ELAPSED LOCAL
Elapsed time at the local site spent processing for the remote site.

ELAPSED REMOTE
Elapsed database access agent time at the remote site (accounting only). This data is not supported for application-directed access and is misleading if both system-directed access and application-directed access flows are used.

CONVERSATION ID
Hexadecimal representation of the VTAM conversation ID for this location.

STATUS
Status of the conversation:

ACTIVE IN VTAM
DB2 transferred control to VTAM for the thread.

SUSPEND IN VTAM
DB2 is waiting for notification of completion of asynchronous event from VTAM.

INACTIVE
None of the above.

LAST VTAM ACTIVITY
Last VTAM activity of the conversation. It can be one of the following:

ALLOCATE
DEALLOCATE
SEND
RECEIVE
NONE

SESSION ID
VTAM-defined session instance ID shown in hexadecimal.

TIME OF LAST MESSAGE
Timestamp when last message was sent or received for this conversation.

Routines

The Routines section shown in Figure 36 can be viewed by any of these methods:

- Scrolling down from the initial DUSER display
- Selecting the RTN expand button

Note: Each part of this section is available only if the user connection has issued stored procedure calls or user-defined functions or has been invoked by a trigger.

```
- - - - - - - - - - - - - - -STORED PROCEDURES- - - - - - - - - - - - - - -
EXECUTING STORED PROC..........YES        WAITING FOR SCHEDULE............NO
STORED PROCEDURE NAME....DSN8SPAS_TEST
THREAD TOKEN............X'7FFFFFFF'

SPAS CPU TIME...............200 us        SQL CALLS.......................9
SPAS IN-DB2 TIME............200 us        CALLS ABENDED...................0
SPAS WAITING ON TCB.........600 ms        CALLS REJECTED..................0
                                          CALLS TIMED OUT.................0
Total elapsed time..........200 us        WAITS ON TCB....................6
Elapsed time in SQL.........200 us
                                          SQL nest level..................5

---and/or--

- - - - - - - - - - - - USER-DEFINED FUNCTIONS- - - - - - - - - - - - - - -
UDF CPU TIME................200 us        UDFs executed...................9
UDF IN-DB2 TIME.............200 us        UDFs ABENDED....................0
UDF WAITING ON TCB..........600 ms        UDFs REJECTED...................0
                                          UDFs TIMED OUT..................0
Total elapsed time..........200 us
Elapsed time (SQL)..........200 us        SQL STMTS executed.............15
                                          SQL nest level..................5

---and/or--

- - - - - - - - - - - - - - - TRIGGERS  - - - - - - - - - - - - - - - - - - -
-- non-enclave times --                   Stmt TRG activated..............9
CPU Time....................200 us        Row TRG activated...............0
Elapsed time................600 ms        Trigger SQL errors..............0
-- enclave times --
CPU time....................200 us        CPU time (before enclave)...200 us
Elapsed time................200 us
                                          SQL nest level..................5
```

Figure 36. DUSER Routines (RTN) Section

where

Stored Procedures:

EXECUTING STORED PROC
YES|NO. Specifies whether the agent is currently running a Stored Procedure.

STORED PROCEDURE NAME
Name of the Stored Procedure being called.

THREAD TOKEN
Thread token that uniquely identifies a specific thread and also appears in the DISPLAY THREAD command response.

For allied threads, the token is acquired at subsystem CREATE THREAD and freed during TERMINATE THREAD.

For database access threads (DBAT), the token is acquired during DBAT initialization and freed during DBAT termination.

WAITING FOR SCHEDULE
YES|NO. The agent is currently queued waiting for a Stored Procedure to be scheduled.

SPAS CPU TIME
Accumulated TCB time spent processing SQL CALL statements in the DB2 stored procedures address space (available only if accounting class 1 is active).

SPAS IN-DB2 TIME
Accumulated TCB time spent in DB2 processing SQL statements issued by stored procedures (available only if accounting class 2 is active).

SPAS WAITING ON TCB
Total elapsed time spent waiting for an available TCB before the stored procedure could be scheduled (available only if accounting class 3 is active).

SQL CALLS
Number of SQL CALL statements executed.

CALLS ABENDED
Number of times a stored procedure terminated abnormally.

CALLS REJECTED
Number of times an SQL CALL statement was rejected because the procedure was in the ‘STOP ACTION(REJECT)’ state.

CALLS TIMED OUT
Number of times an SQL CALL statement timed out while waiting to be scheduled.

WAITS ON TCB
Number of times an SQL CALL statement had to wait for an available TCB before the stored procedure could be scheduled (available only if accounting class 3 is active).

Total elapsed time
Total elapsed time spent in stored procedures, including time spent executing SQL (DB2 6.1 and above).

Elapsed time in SQL
Total elapsed time spent executing SQL in stored procedures (DB2 6.1 and above).

SQL nest level
Maximum level of nested SQL cascading due to triggers, user-defined functions, and stored procedures (DB2 6.1 and above).

Note: This field is displayed only if SQL nesting has taken place.

User-Defined Functions:

The following fields are available for DB2 version 6 and above if user-defined functions have been used:

UDF CPU TIME
Accumulated TCB time used to satisfy user-defined function requests processed in a DB2 stored procedures address space or WLM-established address space.

This time is collected with accounting class 1 active.

UDF IN-DB2 TIME
Accumulated TCB time in DB2 spent processing SQL statements issued by user-defined functions.

This is the time not included in UDF CPU TIME.

This number is calculated only if accounting class 2 is active.

UDF WAITING ON TCB
Total elapsed time spent waiting for an available TCB before the user-defined function could be scheduled.

This value is calculated only if accounting trace class 3 is active.

Total elapsed time
Total elapsed time spent in user-defined functions, including time spent executing SQL.

This value is calculated only if accounting trace class 1 is active.

Elapsed time (SQL)
Total elapsed time spent for user-defined functions to execute SQL.

This value is calculated only if accounting trace class 3 is active.

UDFs executed
Number of user-defined functions executed.

UDFs ABENDED
Number of times a user-defined function abended.

UDFs REJECTED
Number of times a user-defined function was rejected.

UDFs TIMED OUT
Number of times a user-defined function timed out while waiting to be scheduled.

SQL STMTS executed
Number of SQL entry/exit events performed by user-defined functions.

This value is calculated only if accounting trace class 2 is active.

SQL nest level
Maximum level of nested SQL cascading due to triggers, user-defined functions, and stored procedures.

Note: This field is displayed only if SQL nesting has taken place.

Triggers:

The following fields are available for DB2 version 6 and above if a trigger was invoked:

CPU Time (non-enclave)
: Accumulated TCB time used while executing under the control of triggers.

Elapsed time (non-enclave)
: Accumulated elapsed time used while executing under the control of triggers.

CPU time (enclave)
: Accumulated TCB time used for executing triggers under an enclave.

Elapsed time (enclave)
: Accumulated elapsed time used for executing triggers under an enclave.

Stmt TRG activated
: Number of times a statement trigger is activated.

Row TRG activated
: Number of times a row trigger is activated.

Trigger SQL errors
: Number of times an SQL error occurred during execution of a triggered action.

CPU time (before enclave)
: Accumulated TCB time used before the enclave is created.

SQL nest level
: Maximum level of nested SQL cascading due to triggers, user-defined functions, and stored procedures.

Note: This field is displayed only if SQL nesting has taken place.

CICSC—CICS DB2 Connections

This display shows a summary of all the CICS regions connected to the DB2 shown in the TGT field.

```
BOOLE AND BABBAGE----------  CICS DB2 CONNECTIONS   -------------  RX AVAILABLE
SERV ==> CICSC           INPUT    12:37:02  INTVL=> 3  LOG=> N  TGT==> DB2G
PARM ==>                                      ROW     1 OF     2 SCROLL=> CSR
EXPAND:  USERS, LINESEL(CICSR)

  CICS              ACTV  CONN   MAX   WAITS/     IN
CONN ID   RCT NAME  REQS THRDS THRDS OVERFLOW  DOUBT      COMMITS   DB2 CALLS
--------  -------- ----- ----- ----- --------  -----  ----------- -----------
CICS41E3  DSN2CT41     1    21   160        0      0            0           1
CICS51E1  DSN2CT51     0    26   160        0      0            2           2
******************************** END OF DATA ********************************
```

Figure 37. CICS DB2 Connections

Select Code:
CICSC

Parameter:
None

Description:
This display shows a summary of all the CICS regions connected to this DB2.

Service Message(s):
A message in the parameter field of the service shows the sequence number of the CICS region displayed and the total number of CICS regions that can be displayed in a scrollable list. For example:

```
ROW    1 OF 2
```

Expand:
The CICS DB2 CONNECTIONS display can be EXPANDed to the following displays:

USERS
Transfers to the USERS service with a parameter of CICS to show just the active CICS connections.

LINESEL(CICSR)
Transfers to the RCT display (CICSR) for the CICS described by the cursor location. The parameter supplied to CICSR is the CICS connection name. To see more details about a particular CICS connection, move the cursor to the line for that CICS, and press ENTER.

Area 1 - Connection Summary Information

This area of the panel shows one row for each CICS region connected to the DB2 shown in the TGT field.

```
  CICS              ACTV  CONN   MAX   WAITS/     IN
CONN ID   RCT NAME  REQS THRDS THRDS OVERFLOW  DOUBT      COMMITS   DB2 CALLS
--------  -------- ----- ----- ----- --------  -----  ----------- -----------
CICS41E3  DSN2CT41     1    21   160        0      0            0           1
CICS51E1  DSN2CT51     0    26   160        0      0            2           2
******************************** END OF DATA ********************************
```

where

CICS CONN ID
: Connection name that was used by the CICS/DB2 Attachment Facility when signing on to DB2. By default, this name is the VTAM APPLID for this CICS system.

RCT NAME
: Name of the CICS/DB2 Attachment Facility Resource Control Table (RCT), or in the case of CICS/TS 1.2, the name of the DB2CONN object that was used to start this instance of the Attachment Facility.

ACTV REQS
: Number of active requests for this DB2 connection. An asterisk to the right of this field indicates that one or more requests are waiting for a thread.

CONN THRDS
: Number of threads currently connected to DB2 for all RCT entries.

MAX THRDS
: Maximum number of connections to the target DB2 system from each of the reported CICS systems. This value is specified as THRDMAX on the DSNCRCT TYPE=INIT macro or during the RDO definition of the DB2CONN object.

  The THRDMAX value has a relationship to the DB2 CTHREAD value specified in DSNZPARM. THRDMAX is the maximum number of threads permitted for this CICS system, whereas CTHREAD is the maximum number of threads permitted systemwide. If the CTHREAD value is exceeded, the excess requests are queued in DB2 until a thread becomes available.

  Recommendation: Set THRDMAX high enough to support the normal CICS/DB2 workload without exceeding the systemwide CTHREAD value.

WAITS/OVERFLOWS
: Total number of times since this RCT definition was started that a request had to wait for a thread or overflowed to a pool thread.

IN DOUBT
: Current number of IN DOUBT DB2 threads for this CICS.

DB2 CALLS
: Total number of DB2 calls since this RCT definition was activated.

COMMITS
Total number of DB2 COMMITs since this RCT definition was activated.

CICSR—CICS DB2 RCT Summary

This display shows the detail of the CICS-DB2 connection as defined in the CICS Resource Control Table (RCT).

```
BOOLE AND BABBAGE----------  CICS DB2 RCT SUMMARY   -------------  RX AVAILABLE
SERV ==> CICSR           INPUT    15:18:50  INTVL=> 5  LOG=> N  TGT==> DB2HHH
PARM ==> CICS52C1,SORT=RCT                    ROW     1 OF    22 SCROLL=> CSR
EXPAND:  USERS, LINESEL(CICSE), CMRTASK

DB2CONN Name .......RCTHH   Connection Start Time .......27JUL 15.15.32.21
CICS Job Name ...CICS5201   CICS Auth ID ....CICS52C1   DB2 Subsystem ID ..DB2H

Create Thread Err ..ABEND   Err Dest ..CSMT,****,****   Statistics Dest ...CSSL
Connect Error ....SQLCODE   Standby Mode ...RECONNECT   Non-term Release ....NO
Purge Cycle (m,s) ...0,30   No. Plan Entries ......22   No.Tran Entries .....76

Current Tasks ..........1   Max Tasks Used .........1   Max Task Limit .....160
INDOUBT THREADS ........0

                    ------- THREADS -------  WAITS/     DB2           AUTH  THD
TXID     PLANNAME   CURRENT   MAXIMUM TWAIT OVERFLW   CALLS COMMITS CHECKS RUSE
-------- --------   -------   ------- ----- ------- ------- ------- ------ ----
*COMMAND                  0         1  POOL       0       0       0      0    0
*POOL    DSN8CC0          0         5  YES        0       0       0      0    0
ABCD     ABCDXYZZ         0         1  YES        0       0       0      0    0
A100     TEST             0         1  POOL       0       0       0      0    0
DBBS     DBBSRVR          0         2  YES        0       0       0      0    0
D8CS     DSN8CC0          0         2  YES        0       0       0      0    0
H000     TSMPL03          1        25  YES        0       1       0      1    0
TSMA     TSMPL10          0         1  YES        0       0       0      0    0
TSMB     TSMPL11          0         1  NO         0       0       0      0    0
TSMC     TSMPL12          0         1  YES        0       0       0      0    0
TSM2     TSMPL02          0         1  YES        0       0       0      0    0
TSM4     TSMPL04          0         1  YES        0       0       0      0    0
TSM5     TSMPL05          0         1  YES        0       0       0      0    0
TSM6     TSMPL06          0         1  YES        0       0       0      0    0
TSM7     (DYN)            0         1  POOL       0       0       0      0    0
TSM9     TSMCOM9          0         1  YES        0       0       0      0    0
TST1     CMRGPL21         0         1  YES        0       0       0      0    0
TST2     CMRGPL21         0         1  YES        0       0       0      0    0
TST3     CMRGPL21         0         1  YES        0       0       0      0    0
TST4     CMRGPL21         0         1  YES        0       0       0      0    0
TXXX     TSMPL08          0         1  POOL       0       0       0      0    0
XYZ1     CMRPLAN          0         1  POOL       0       0       0      0    0
******************************** END OF DATA ********************************
```

Figure 38. CICS DB2 RCT Summary for CICS/TS 1.2 and Later

```
BOOLE AND BABBAGE----------  CICS DB2 RCT SUMMARY   -------------  RX AVAILABLE
SERV ==> CICSR           INPUT    16:20:29  INTVL=> 3  LOG=> N  TGT==> DB2G
PARM ==> CICS51E2,SORT=RCT                    ROW     1 OF    22 SCROLL=> CSR
EXPAND:  USERS, LINESEL(CICSE), CMRTASK

CICS JOB NAME .....CICS5102   RCT NAME .......DSN2CT51   STATISTICS DEST ..CSSL
CICS AUTHID .......CICS51E2   DYN ENTRY TRACEID ...449   ERRDEST CSMT,****,****
NO. TRANIDS .............74   DYN EXIT TRACEID ....450   SNAP SYSOUT CLASS ...R
RCT TABLE ENTRIES .......22   DB2 CALL TRACEID ....448   START TRAN ID ....DSNC

CURRENT THREAD REQUEST ...1   MAX THREAD LIMIT ....160   THRD PURGE TIME ....30
CURRENT SUBTASKS ........26   IN DOUBT THREADS ......0   CREATE THD ERR ...AEY9

     #IN          -------- THREADS --------  WAITS/     DB2           AUTH  THD
TXID GRP PLANNAME CURR ACTV PROT  MAX TWAIT OVERFLW   CALLS COMMITS CHECKS RUSE
---- --- -------- ---- ---- ---- ---- ----- ------- ------- ------- ------ ----
DSNC   0            0    1    1    1  POOL       0       0       0      0    0
P100   0 DSN8CC0    0    5    0    5  YES        0       0       0      0    0
D8CS   2 DSN8CC0    0    2    2    3  YES        0       0       0      0    0
TSM7   1 (DYN)      0    1    0    1  POOL       0       0       0      0    0
TXXX   2 TSMPL08    0    1    1    2  POOL       0       0       0      0    0
DBBS   1 DBBSRVR    0    2    0    2  YES        0       0       0      0    0
TST1   1 CMRGPL21   0    1    1    2  YES        0       0       0      0    0
TST2   1 CMRGPL21   0    1    1    2  YES        0       0       0      0    0
TST3   1 CMRGPL21   0    1    1    2  YES        0       0       0      0    0
TST4   1 CMRGPL21   0    1    1    2  YES        0       0       0      0    0
TSM2   1 TSMPL02    0    1    1    2  YES        0       0       0      0    0
TSM4   1 TSMPL04    0    1    1    2  YES        0       0       0      0    0
TSM5   1 TSMPL05    0    1    1    2  YES        0       0       0      0    0
TSM6   1 TSMPL06    0    1    1    2  YES        0       0       0      0    0
TSM9   1 TSMCOM9    0    1    1    2  YES        0       0       0      0    0
TSMA   1 TSMPL10    0    1    1    2  YES        0       0       0      0    0
TSMB   1 TSMPL11    0    1    1    2  NO         0       0       0      0    0
TSMC   1 TSMPL12    0    1    1    2  YES        0       0       0      0    0
XYZ1   1 CMRPLAN    0    1    0    1  POOL       0       0       0      0    0
ABCD   4 ABCDXYZZ   0    1    0    1  YES        0       0       0      0    0
H000  50 TSMPL03    1   25    5   25  YES        0       8       7      8    1
A100   1 TEST       0    1    0    1  YES        0       0       0      0    0
******************************** END OF DATA ********************************
```

Figure 39. CICS DB2 RCT Summary for CICS/TS 1.1 and Below

Select Code:

CICSR

Parameter:

The following parameters can be specified for this service:

- CICS connection id

  DB2 connection name used by this CICS region. It is the same as the CICS VTAM APPLID. If this parameter is not specified, information for the first CICS connection detected is displayed.

- SORT=

  SORT is an optional parameter that can be used to sort a displayed list by any of the column headings. The sort parameter values can either be typed directly in the PARM field or selected by moving the cursor to the column heading and pressing ENTER. The first two characters of the column heading are used with SORT as

  ```
  SORT=cc
  ```

  where cc can be any of the following:

RCT	Displays the RCT entries in the same sequence as they were specified on the RCT table generation. This is the initial default entry.
TX	Sorts in ascending sequence by TXID.
GR	Sorts in descending order by the number of transactions in the group (not valid for CICS/TS 1.2 and later).
PL	Sorts in ascending sequence by plan name.
CU	Sorts in descending order by the number of current threads.
AC	Sorts in descending order by the number of active threads (not valid for CICS/TS 1.2 and later).
PR	Sorts in descending order by the number of protected threads (not valid for CICS/TS 1.2 and later).
MA	Sorts in descending order by the maximum thread value for the group.
TW	Sorts in ascending sequence by TWAIT value.
OV	Sorts in descending order by the number of waits or overflows.
CA	Sorts in descending order by the number of DB2 calls.
CO	Sorts in descending order by the number of DB2 commits.
CH	Sorts in descending order by the number of DB2 authorization checks.

  Note: You also can sort on each column by tabbing to the column header and pressing ENTER.

Description:

This service shows the detail of the CICS to DB2 connection as defined in the CICS Resource Control Table (RCT).

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first entry displayed and the total number of entries that can be displayed in the scrollable list; for example:

```
ROW    1 OF 16
```

Expand:

The CICS DB2 RCT summary display can be EXPANDed to the following displays:

USERS

Transfers to the USERS service with a parameter of CICS to show just the active CICS connections.

LINESEL(CICSE)

Transfers to the RCT Entry display (CICSE) for the TXID described by the cursor location. The parameter supplied to CICSE is the CICS connection name and the TXID.

To expand to the CICSE service showing all the detail about a particular RCT entry, move the cursor to the line for that entry and press ENTER.

CMRTASK

MAINVIEW for CICS DB2TASK display for all tasks accessing DB2 from the target CICS system.

Note: If MAINVIEW for CICS is not accessible, this EXPAND button is not highlighted and cannot be selected.

Scrolling

The display is scrollable except for the column headings.

The row xx of xx refers to the RCT table entries displayed, not the heading lines.

Area 1 - RCT General Information for CICS/TS 1.2 and Later

This area of the panel shows Resource Control Table (RCT) general information for CICS/TS 1.2 and later.

```
DB2CONN Name .......RCTHH   Connection Start Time .......27JUL 15.15.32.21
CICS Job Name ...CICS5201   CICS Auth ID ....CICS52C1   DB2 Subsystem ID ..DB2H

Create Thread Err ..ABEND   Err Dest ..CSMT,****,****   Statistics Dest ...CSSL
Connect Error ....SQLCODE   Standby Mode ...RECONNECT   Non-term Release ....NO
Purge Cycle (m,s) ...0,30   No. Plan Entries ......22   No.Tran Entries .....76
```

where

DB2CONN Name
: Name of the CICS Resource Definition Online (RDO) object that describes the DB2 CICS connection. This name is derived either from the macro level Resource Control Table (RCT) or from the installed RDO definition.

Connection Start Time
: The time when the CICS/DB2 Attachment Facility was started and it connected to DB2.

CICS Job Name
: Job name or started task name for this CICS region.

CICS Auth ID
: DB2 authorization ID for this CICS region.

  This value is specified in the SIGNID parameter of the DSNCRCT TYPE=INIT statement or the definition of the DB2CONN object. If SIGNID is not specified, this ID defaults to the VTAM APPLID of the CICS region.

DB2 Subsystem ID
: Name of the DB2 subsystem to which this CICS is connected.

Create Thread Err
: Indicates the action that will be taken by the CICS/DB2 Attachment Facility in case of a CREATE THREAD failure.

  Possible values are

  ABEND
  : Indicates a transaction dump will be taken and the DSNCSQL Resource Manager Interface (RMI) associated with this transaction will be disabled. Disabling the RMI causes all subsequent SQL requests to receive a CICS AEY9 abend.

  N906
  : Indicates the transaction will receive a -906 SQLCODE and DSNCSQL RMI will not be disabled.

  N906D
  : Indicates the transaction will receive a -906 SQLCODE, DSNCSQL RMI will not be disabled, and a CICS transaction dump will be taken.

Err Dest
CICS transient data queues to which the CICS/DB2 Attachment Facility will send error and unsolicited messages. Up to three separate queues may be specified. Asterisks (****) indicate an unassigned destination. Any queue name can be changed with the Attachment Facility control transaction (DSNC).

Hint: Messages concerning the current state of the Attachment Facility may be found on the specified queue. If you are experiencing problems with the Attachment Facility, this queue should be checked.

Statistics Dest
CICS transient data queue the CICS/DB2 Attachment Facility is to use for the statistical report. This report is generated during the shutdown of the Attachment Facility. This destination is specified by the STATSQUEUE parameter of the DB2CONN object.

Connect Error
Indicates how the information that CICS is not connected to DB2 because the adaptor is in *standby mode* is reported back to an application that has issued an SQL request.

Possible values are

ABEND
Indicates the transaction will be abended with abend code AEY9.

SQLCODE
Indicates the transaction will receive a -906 SQLCODE and not be terminated.

Standby Mode
Specifies the action to be taken by the CICS/DB2 Attachment Facility if DB2 is not active when an attempt is made to connect CICS to DB2.

Possible values are

NOCONNECT
Specifies that the CICS/DB2 Attachment Facility should terminate.

CONNECT
Specifies that the CICS/DB2 Attachment Facility should wait in *standby mode* for DB2 to become active. If the connection is made, and DB2 subsequently fails, the CICS/DB2 Attachment Facility terminates.

RECONNECT
Specifies that the CICS/DB2 Attachment Facility will go into *standby mode* and wait for DB2. If DB2 subsequently fails after the connection is made, the CICS/DB2 Attachment Facility reverts to *standby mode* and CICS subsequently reconnects to DB2 when DB2 recovers.

Non-term Release
Specifies whether or not a non-terminal transaction will release threads for reuse at intermediate syncpoints.

Possible values are

NO
Non-terminal transactions do not release threads for reuse at intermediate syncpoints.

YES
Non-terminal transactions release threads for reuse at intermediate syncpoints.

Purge Cycle
: Length of time between purge cycles. The purge is used to terminate unused protected threads. This is done by flagging any idle protected threads in each purge cycle. If the thread still has not been used by the next purge cycle, the thread is terminated.

  The thread purge time is dependent on the release of the CICS/DB2 Attachment Facility. For attaches supplied with all releases of DB2, the thread purge time is a hardcoded constant of 30 seconds. For attaches supplied with CICS 4.1.0 (or higher), this time is defined by the PURGEC parameter on the DSNCRCT TYPE=INIT macro. It may be up to 59 minutes, 59 seconds, with a default time of 30 seconds.

No. Plan Entries
: Number of distinct DB2ENTRY objects defined in this instance of the CICS/DB2 Attachment Facility.

No. Tran Entries
: Number of distinct DB2TRAN objects defined in this instance of the CICS/DB2 Attachment Facility.

Area 1 - RCT General Information for CICS/TS 1.1 and Below

This area of the panel shows Resource Control Table (RCT) general information for CICS/TS 1.1 and below.

```
CICS JOB NAME .....CICS5102   RCT NAME .......DSN2CT51   STATISTICS DEST ..CSSL
CICS AUTHID .......CICS51E2   DYN ENTRY TRACEID ...449   ERRDEST CSMT,****,****
NO. TRANIDS .............74   DYN EXIT TRACEID ....450   SNAP SYSOUT CLASS ...R
RCT TABLE ENTRIES .......22   DB2 CALL TRACEID ....448   START TRAN ID ....DSNC
```

where

CICS JOB/STC NAME
: Job name or started task name for this CICS region.

RCT NAME
: Name of the Resource Control Table (RCT) currently in use by this CICS.

STATISTICS DEST
: Transient data queue for the DB2 attachment statistical report.

CICS AUTHID
: DB2 authorization ID for this CICS region. The name is specified by the SIGNID parameter of the DSNCRCT TYPE=INIT macro. If this parameter is not specified, the VTAM APPLID for the CICS system is used.

DYN ENTRY TRACEID
: Trace ID (decimal) to be used for recording the entry to the user dynamic plan exit routine.

ERRDEST=
: Up to three transient data queues for unsolicited messages. Asterisks (****) indicate an unassigned destination.

NO. TRANIDS
: Number of distinct transaction IDs defined in this RCT table definition. This can be greater than the number of RCT table entries because multiple transaction IDs can be defined for one entry.

DYN EXIT TRACEID
: Trace ID (decimal) to be used for recording the exit from the user dynamic plan exit routine.

SNAP SYSOUT CLASS
: SYSOUT class to use for a SNAP dump should a thread subtask fail.

RCT TABLE ENTRIES
: Number of entries in this DSNCRCTx table.

DB2 CALL TRACEID
: Value of the CICS user trace ID (decimal) that the CICS attachment uses to trace calls to DB2.

START TRAN ID
Name of the transaction to use to start the CICS connection to DB2.

Area 2 - Thread Connection Summary for CICS/TS 1.2 and Later

This area of the panel shows thread connection summary information for CICS/TS 1.2 and later.

```
Current Tasks ..........1   Max Tasks Used .........1   Max Task Limit .....160
INDOUBT THREADS ........0
```

where

Current Tasks
: Number of MVS subtasks currently allocated for thread connections by this CICS system.

Max Tasks Used
: Maximum number of threads that were used by this CICS region.

Max Task Limit
: Maximum number of threads that are permitted in this CICS region, as specified in the TCBLIMIT parameter. The recommended value for TCBLIMIT is the sum of all the values of the THREADLIMIT parameters on the DB2CONN and DB2ENTRY objects, plus COMTHREADLIMIT. The value you choose for TCBLIMIT can be exceeded by increasing the THREADLIMIT values for selected subtasks.

  Caution: The TCBLIMIT value has a relationship to the DB2 CTHREAD value specified in DSNZPARM. TCBLIMIT is the maximum number of threads permitted by this CICS system, whereas CTHREAD is the maximum number of threads permitted systemwide. If the CTHREAD value is exceeded, the excess requests are queued in DB2 until a thread becomes available.

INDOUBT THREADS
: The current number of IN DOUBT DB2 threads for this CICS region. An IN DOUBT thread is usually caused by an MVS system or DB2 system failure during an application program's COMMIT process. DB2 usually resolves such threads during its restart process, but occasionally, due to an application program's other CICS activity, it is not able to. IN DOUBT threads may also be caused by performing a CICS COLD restart after a DB2 or MVS failure.

  Recommendation: An IN DOUBT thread represents a significant set of resources not available to any DB2 application. An effort to resolve any IN DOUBT threads should be made as quickly as possible.

Area 2 - Thread Connection Summary for CICS/TS 1.1 and Below

This area of the panel shows thread connection summary information for CICS/TS 1.1 and below.

```
CURRENT THREAD REQUEST ...1   MAX THREAD LIMIT ....160   THRD PURGE TIME ....30
CURRENT SUBTASKS ........26   IN DOUBT THREADS ......0   CREATE THD ERR ...AEY9
```

where

CURRENT THREAD REQUESTS
: Sum of current thread requests for all entries in this RCT table.

MAX THREAD LIMIT
: Maximum number of threads allowed for this CICS as specified on the THRDMAX parameter.

THREAD PURGE TIME
: Number of seconds to wait before terminating an unused thread.

The purge is used to terminate unused protected threads. This is done by flagging any idle protected threads in each purge cycle. If the thread still has not been used by the next purge cycle, the thread is terminated.

The thread purge time is dependent on the release of the CICS/DB2 Attachment Facility. For attaches supplied with all releases of DB2, this time is a hardcoded constant of 30 seconds. For attaches supplied with CICS 4.1.0 (or higher), this time is defined by the PURGEC parameter on the DSNCRCT TYPE=INIT macro with a default of 30 seconds.

Note: This discussion applies only to protected threads as specified in the THRDS parameter. Threads that are not protected are terminated immediately after a COMMIT (EXEC CICS SYNCPOINT), unless another identical transaction is queued waiting for this thread.

CREATE THD ERR
: Indicates the action that will be taken by the CICS/DB2 Attachment Facility in case of a CREATE THREAD failure.

Possible values are

AEY9
: Indicates a transaction dump will be taken and the DSNCSQL Resource Manager Interface (RMI) associated with this transaction will be disabled. Disabling the RMI causes all subsequent SQL requests to receive a CICS AEY9 abend.

N906
: Indicates the transaction will receive a -906 SQLCODE and DSNCSQL RMI will not be disabled.

N906D
: Indicates the transaction will receive a -906 SQLCODE, DSNCSQL RMI will not be disabled, and a CICS transaction dump will be taken.

More information is available in the *DB2 Administration Guide* in the DSNCRCT TYPE=INIT section under the PCTEROP parameter.

CURRENT SUBTASKS
Number of active MVS subtasks currently allocated for this CICS attachment. This can be greater than the number of connected threads if the number of connected threads exceeds THRDMAX-2 and some protected threads must be terminated.

IN DOUBT THREADS
Current number of IN DOUBT DB2 threads for this CICS.

Area 3 - RCT Entry Summary

This area of the panel shows a summary line for each RCT entry.

```
     #IN          -------- THREADS --------  WAITS/     DB2           AUTH  THD
TXID GRP PLANNAME CURR ACTV PROT  MAX TWAIT OVERFLW   CALLS COMMITS CHECKS RUSE
---- --- -------- ---- ---- ---- ---- ----- ------- ------- ------- ------ ----
DSNC   0             0    1    1    1  POOL       0       0       0      0    0
P100   0 DSN8CC0     0    5    0    5  YES        0       0       0      0    0
D8CS   2 DSN8CC0     0    2    2    3  YES        0       0       0      0    0
TSM7   1 (DYN)       0    1    0    1  POOL       0       0       0      0    0
TXXX   2 TSMPL08     0    1    1    2  POOL       0       0       0      0    0
DBBS   1 DBBSRVR     0    2    0    2  YES        0       0       0      0    0
TST1   1 CMRGPL21    0    1    1    2  YES        0       0       0      0    0
TST2   1 CMRGPL21    0    1    1    2  YES        0       0       0      0    0
TST3   1 CMRGPL21    0    1    1    2  YES        0       0       0      0    0
TST4   1 CMRGPL21    0    1    1    2  YES        0       0       0      0    0
TSM2   1 TSMPL02     0    1    1    2  YES        0       0       0      0    0
TSM4   1 TSMPL04     0    1    1    2  YES        0       0       0      0    0
TSM5   1 TSMPL05     0    1    1    2  YES        0       0       0      0    0
TSM6   1 TSMPL06     0    1    1    2  YES        0       0       0      0    0
TSM9   1 TSMCOM9     0    1    1    2  YES        0       0       0      0    0
TSMA   1 TSMPL10     0    1    1    2  YES        0       0       0      0    0
TSMB   1 TSMPL11     0    1    1    2  NO         0       0       0      0    0
TSMC   1 TSMPL12     0    1    1    2  YES        0       0       0      0    0
XYZ1   1 CMRPLAN     0    1    0    1  POOL       0       0       0      0    0
ABCD   4 ABCDXYZZ    0    1    0    1  YES        0       0       0      0    0
H000  50 TSMPL03     1   25    5   25  YES        0       8       7      8    1
A100   1 TEST        0    1    0    1  YES        0       0       0      0    0
******************************** END OF DATA ********************************
```

where

TXID
: Transaction name or group name of this RCT definition.

IN GROUP
: Number of transactions in this group (CICS/TS 1.1 and below only).

PLANNAME
: Name of the plan to use for this transaction or group. DYN indicates that the plan name is dynamically assigned by an exit program.

THREADS

This section pertains to thread activity.

CURR Number of current thread requests. An asterisk to the right of this value indicates that some requests are queued or have overflowed to the pool.

ACTV Maximum number of threads that are allowed to be active for this group before requests are made to wait or are diverted to the pool. This value is specified by the THRDA parameter. THRDA can be adjusted dynamically up to the limit defined by MAX (THRDM).

Note: The THRDA parameter is not supported by CICS/TS 1.2 and later and this field is not shown in CICSR when the target is a CICS/TS 1.2 or greater system.

PROT Number of protected threads for this RCT entry as defined by the THRDS definition parameter.

Note: The THRDS parameter has been redefined by CICS/TS 1.2 and later and this field is not shown in CICSR when the target is a CICS/TS 1.2 or greater system.

MAX Maximum number of threads that can be started for this group as defined by the THRDM definition parameter.

TWAIT Indicates the action to take when the THRDA threshold is reached.

Possible values are

POOL Overflow to the pool
YES Wait for an entry thread to become available
NO Abend the program

WAITS/OVERFLW

Total number of times a transaction waited for a thread or overflowed to a POOL thread since this RCT definition was activated.

If TWAIT=POOL, the count represents overflows.

If TWAIT=YES, the count represents waits.

If TWAIT=NO, the count should be zero.

DB2 CALLS

Total number of DB2 calls since this RCT definition was activated.

COMMITS

Total number of DB2 commits since this RCT definition was activated.

AUTH CHECKS

Total number of DB2 authorization checks since this RCT definition was activated. If this number is less than the number of commits, it indicates thread reuse is saving authorization calls.

THD REUSE

Number of times a thread was reused in this RCT group (CICS 5.1.0 and later only).

This count is available only with CICS 5.1.0 and this column is not shown if the CICS system is less than Release 5.

CICSE—CICS DB2 RCT Entry Detail

This display shows the detail for one RCT entry.

```
BOOLE AND BABBAGE----------   CICS DB2 RCT ENTRY    -------------  RX AVAILABLE
SERV ==> CICSE           INPUT    15:19:01  INTVL=> 5  LOG=> N  TGT==> DB2HHH
PARM ==> CICS52C1,H000                        ROW     1 OF    32 SCROLL=> CSR
EXPAND:  USERS, LINESEL(DUSER), CICST

DB2Entry Name ...............H000          DB2CONN Name ...............RCTHH
CICS Connect ID .........CICS52C1          CICS Auth ID ............CICS52C1
DB2Entry Install time ...27JUL 15.13.30.48
                                             - - - - THREAD COUNTS - - - -
TYPE .......................ENTRY          Current Threads ................1
AUTH String ..............ACCTDEP          HWM Threads ....................1
PLAN NAME ................TSMPL03          Thread Limit ..................25
PLANExitname ............********          Protected Threads ..............0
TCB PRIority ................HIGH          HWM Protected Threads ..........0
DRollback ...................YES          Protected Thread Limit .........5
THREADWait ...................YES          Thread Reuse Count .............0
DB2 Accounting Type ..........UOW          Thread Terminations ............0
                                          Number of WAITS ................0
DB2 CALLS ......................1            - - - TASK (TCB) COUNTS - - -
COMMITS ........................0          Current Tasks ..................1
READ-ONLY COMMITS ..............0          HWM for Tasks ..................1
ROLLBACKS ......................0          Tasks on ReadyQ ................0
AUTHORIZATIONS .................1          HWM Tasks on ReadyQ ............0
Total Transactions .............0

TRANIDS................. H000 H001 H002 H003 H004 H005 H006 H007 H008 H009
                         H010 H011 H012 H013 H014 H015 H016 H017 H018 H019
                         H020 H021 H022 H023 H024 H025 H026 H027 H028 H029
                         H030 H031 H032 H033 H034 H035 H036 H037 H038 H039
                         H040 H041 H042 H043 H044 H045 H046 H047 H048 TSM3

- - - - - - - - - - - - - THREAD RESOURCE ANALYSIS - - - - - - - - - - - - -

                        ---SINCE CREATE THREAD---
THD#   STATUS   TOT CPU #COMMITS #ABORTS  ELAPSED TXID PLAN      TASK USERID
----   ------- -------- -------- ------- -------- ---- -------- ----- --------
   0   ACTIVE     15 ms        0       0    17 s  TSM3 TSMPL03     29 BOLPJE1
********************************* END OF DATA *********************************
```

Figure 40. CICS DB2 RCT Entry for CICS/TS 1.2 and Later

```
BOOLE AND BABBAGE----------   CICS DB2 RCT ENTRY    -------------  RX AVAILABLE
SERV ==> CICSE           INPUT    12:38:21  INTVL=> 3  LOG=> N  TGT==> DB2G
PARM ==> CICS51E1,D8CS                        ROW     1 OF    24 SCROLL=> CSR
EXPAND:  USERS, LINESEL(DUSER)

CICS CONNECT ID......... CICS51E1           RCT NAME ............ DSN2CT51
CICS AUTHID............. CICS51E1
GROUP ID..........(TXID)     D8CS           --------- STATISTICS ---------
PLAN NAME.........(PLAN)  DSN8CC0           DB2 CALLS ...................0
PLAN ALLOC EXIT(PLNPGME)                    COMMITS .....................0
TCB DISPATCHING.(DPMODE)     HIGH           READ-ONLY COMMITS ...........0
ROLLBACK.........(ROLBE)      YES           ABORTS ......................0
AUTH=............ USER,TERM,TXID           AUTHORIZATIONS ..............0
TYPE.............(TYPE)    ENTRY
TWAIT............(TWAIT)      YES           WAITS .......................0
ACTIVE LIMIT.....(THRDA)        2           CURRENT THREAD REQUESTS .....0
PROTECTED THREADS(THRDS)        2           ACTIVE SUBTASKS .............2
THREAD MAX.......(THRDM)        3           MAX THREAD REQUESTS .........0
ACCOUNTING/TRAN.(TOKENE)       NO           THREAD REUSE ................0
                                            TCBS ATTACHED ...............4
TRANIDS...........(TXID) DTST D8CS

- - - - - - - - - - - - - - THREAD RESOURCE ANALYSIS - - - - - - - - - - - - -

                        ---SINCE CREATE THREAD---
THD# P STATUS   TOT CPU #COMMITS #ABORTS  ELAPSED TXID PLAN      TASK USERID
---- - ------- -------- -------- ------- -------- ---- -------- ----- --------
   0 P CONN       14 ms
   1 P CONN       19 ms
********************************* END OF DATA *********************************
```

Figure 41. CICS DB2 RCT Entry for CICS/TS 1.1 and Below

Select Code:

CICSE

Parameter:

The following parameters can be specified for this service. If no parameter is specified, the first RCT entry of the first CICS connection is displayed.

- CICS connection id

  DB2 connection name used by this CICS region. It is the same as the CICS VTAM APPLID.

- txid

  Name of this transaction group. This is the first transaction specified on the TXID operand. This parameter is optional. If it is omitted, the first RCT entry is displayed.

Description:

This service displays detail for one RCT entry.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first line displayed and the total number of lines that can be displayed. For example:

```
ROW 1 OF   16
```

Expand:

The CICS DB2 RCT Summary display can be EXPANDed to the following display:

USERS
: User Summary display with a parameter of CICS to show only the active CICS connections.

LINESEL(DUSER)
: A detailed display of information about a specific thread (DUSER) can be selected from the Thread Resource Analysis section by positioning the cursor on the line for that thread and pressing ENTER.

CICST
: CICS DB2 RCT Transactions display.

Scrolling:

The display can be scrolled up or down using the appropriate PF keys, or it can be moved forwards (PF11) or backwards (PF10) through the RCT table.

Area 1 - RCT Entry Parameters for CICS/TS 1.2 and Later

This area of the panel shows the Resource Control Table (RCT) entry parameters for CICS/TS 1.2 and later.

```
DB2Entry Name ...............H000          DB2CONN Name ...............RCTHH
CICS Connect ID .........CICS52C1          CICS Auth ID ............CICS52C1
DB2Entry Install time ...27JUL 15.13.30.48

TYPE ......................ENTRY
AUTH String ..............ACCTDEP
PLAN NAME ................TSMPL03
PLANExitname ............********
TCB PRIority ................HIGH
DRollback ...................YES
THREADWait ..................YES
DB2 Accounting Type ..........UOW
```

where

DB2Entry Name
: Name of the CICS Resource Definition Online (RDO) object that describes a group of connections to DB2 for a given plan. This name is derived either from the macro level Resource Control Table (RCT) or from the installed RDO definition.

CICS Connect ID
: DB2 connection name that this CICS region used to identify itself to DB2. By default, this name is the CICS VTAM APPLID for this CICS system.

DB2Entry Install time
: Date and time this DB2Entry object was installed and activated to DB2.

TYPE
: Type of this DB2Entry object. Possible values are

  ENTRY
  POOL
  COMMAND

AUTH String
: Value of the AUTH directive that determines how the CICS/DB2 Attachment Facility constructs the DB2 authorization ID for this DB2Entry object. It can be either a directive, such as USER, USERID, TERM, TXID, SIGNID, or GROUP; or it can be a character string of up to eight bytes. If a character string was specified, the field title is *AUTH String*; otherwise, it reads *AUTH Type*.

  Recommendation: Keep your authorization scheme as simple as possible. The higher the number of unique authorization IDs in DB2, the more expensive an authorization check becomes during thread creation.

PLAN NAME
: Name of the DB2 PLAN to be used for this DB2Entry object. DYN indicates that the PLAN name is dynamically assigned by a PLAN allocation exit program.

PLANExitname
: Name of the program specified for the PLANEXITNAME parameter. This program is called to dynamically assign the PLAN name for a transaction in this DB2Entry object.

Recommendation: Avoid the use of the dynamic plan allocation exit.

The dynamic plan allocation exit operation prevents thread reuse. This feature should be used only for transactions that link to a number of different programs that invoke DB2. An example of such a transaction is the traditional application generator, such as CSP. The plan for such a transaction can get so large that performance and BIND problems can occur, thus necessitating splitting the plan into smaller parts.

TCB PRIority
: Subtask dispatching priority relative to the CICS main task. This value is specified by the PRIority parameter. Possible values are

HIGH	Thread TCBs have a higher MVS priority than CICS.
EQ	Thread TCBs share the same MVS priority as CICS.
LOW	Thread TCBs have a lower MVS priority than CICS.

Recommendation:

PRIority(LOW)
: Use for CPU-intensive transactions in DB2 and for transactions where the CICS system must also process non-DB2 work.

PRIority(HIGH)
: Use for short-duration transactions.

PRIority(EQ)
: This is logically no different than PRIority=LOW, due to the way MVS subtasking works.

DRollback
: YES|NO. Indicates whether a syncpoint rollback is to be performed in the event this program is selected as a victim in a DB2 deadlock. This value is specified by the DRollback parameter when defining the DB2Entry object.

THREADWait
: Indicates the action to be taken when the number of concurrent requests in this DB2Entry object exceeds the THREADLimit value. Possible values are

POOL	Overflow to the pool.
YES	Wait for an entry thread to become available.
NO	Abend the program.

DB2 Accounting Type

Specifies whether the CICS/DB2 Attachment Facility will produce a DB2 accounting record per unit of work (UOW), per transaction, per tranid (i.e. when the tranid changes) or not at all, for transactions using this DB2Entry object. Possible values are

NONE There are no accounting records to be cut.

TASK The CICS/DB2 Attachment Facility will cut an accounting record per task.

TXID The CICS/DB2 Attachment Facility will cut an accounting record only when the tranid using the thread changes.

UOW The CICS/DB2 Attachment Facility will cut an accounting record per unit of work (UOW), provided the thread has been released at syncpoint.

DB2CONN Name

Name of the CICS Resource Definition Online (RDO) object that describes the DB2/CICS connection. This name is derived either from the macro level Resource Control Table (RCT) or from the installed RDO definition.

CICS Auth ID

DB2 authorization ID for this CICS region. This value is specified in the SIGNID parameter of the DSNCRCT TYPE=INIT statement or the definition of the DB2CONN object. If SIGNID is not specified, this ID defaults to the VTAM APPLID of the CICS system.

Area 1 - RCT Entry Parameters for CICS/TS 1.1 and Below

This area of the panel shows the Resource Control Table (RCT) entry parameters for CICS/TS 1.1 and below.

```
CICS CONNECT ID......... CICS51E1
CICS AUTHID............ CICS51E1
GROUP ID..........(TXID)     D8CS
PLAN NAME.........(PLAN)  DSN8CC0
PLAN ALLOC EXIT(PLNPGME)
TCB DISPATCHING.(DPMODE)     HIGH
ROLLBACK.........(ROLBE)      YES
AUTH=............ USER,TERM,TXID
TYPE.............(TYPE)    ENTRY
TWAIT............(TWAIT)      YES
ACTIVE LIMIT.....(THRDA)        2
PROTECTED THREADS(THRDS)        2
THREAD MAX.......(THRDM)        3
ACCOUNTING/TRAN.(TOKENE)       NO
```

where

CICS CONNECT ID
: DB2 connection name that this CICS region used to identify itself to DB2. It is the same as the CICS VTAM APPLID.

CICS AUTHID
: DB2 authorization ID for this CICS region. The name is specified by the SIGNID parameter of the DSNCRCT TYPE=INIT macro. If this parameter is not specified, the VTAM APPLID for the CICS system is used.

GROUP ID (TXID)
: Name of this transaction group. This is the first transaction for this RCT entry.

PLAN NAME
: Name of the DB2 PLAN used for the group. DYN indicates that the PLAN name is dynamically assigned by the Plan allocation exit.

PLAN ALLOC EXIT
: Name of the module specified on the PLNPGME parameter that is called to determine a PLAN name for the group. This is blank if PLNEXIT=NO is specified.

TCB DISPATCHING
: HIGH|EQ|LOW. The subtask dispatching priority relative to the CICS main task as specified on the DPMODE parameter.

ROLLBACK (ROLBE)
: YES|NO. Indicates whether the synchronization point rollback is to be performed in the event this program is selected in a DB2 deadlock as specified on the ROLBE parameter.

AUTH=

Value of the AUTH DIRECTIVES that determines how CICS is to construct the DB2 authorization ID for this entry. It can either be a character string at a maximum of eight bytes or three subparameters.

Possible subparameter values are

GROUP	Use the RACF group name
SIGNID	Use the CICS authorization ID
TERM	Use the terminal name
TXID	Use the transaction ID
USER	Use the CICS sign-on user operator identification (3 characters)
USERID	Use the CICS sign-on user ID (8 characters)
*	Null indicator

TYPE

RCT definition type, which can be

- ENTRY
- POOL
- COMMAND

TWAIT

Indicates the action to take when the THRDA threshold is reached.

Possible values are

POOL	Overflow to the pool
YES	Wait for an entry thread to become available
NO	Abend the program

ACTIVE LIMIT

Threshold for invoking TWAIT processing as specified on the THRDA parameter.

PROTECTED THREADS

Number of protected threads as specified on the THRDS parameter.

THREAD MAX

Maximum number of threads allowed for this transaction group as specified on the THRDM parameter.

ACCOUNTING/TRAN (TOKENE)

States whether (YES/NO) accounting records are created for each transaction, even those that are reusing threads.

Area 2 - Statistics for CICS/TS 1.2 and Later

This area of the panel shows statistics on DB2 calls, commits, overflows, threads, and tasks for CICS/TS 1.2 and later.

```
                                          - - - - THREAD COUNTS - - - -
                                        Current Threads ................1
                                        HWM Threads ....................1
                                        Thread Limit ...................25
                                        Protected Threads ..............0
                                        HWM Protected Threads ..........0
                                        Protected Thread Limit .........5
                                        Thread Reuse Count .............0
                                        Thread Terminations ............0
                                        Number of WAITS ................0
DB2 CALLS ......................1          - - - TASK (TCB) COUNTS - - -
COMMITS ........................0        Current Tasks ..................1
READ-ONLY COMMITS ..............0        HWM for Tasks ..................1
ROLLBACKS ......................0        Tasks on ReadyQ ................0
AUTHORIZATIONS .................1        HWM Tasks on ReadyQ ............0
Total Transactions .............0
```

where

DB2 CALLS
: Number of DB2 calls made by transactions in this DB2Entry object since the DB2 connection was started.

COMMITS
: Number of two-phase DB2 commits for transactions in this DB2Entry object since the DB2 connection was started.

READ-ONLY COMMITS
: Number of DB2 READ-ONLY commits for transactions in this DB2Entry object since the DB2 connection was started (single-phase commits).

ROLLBACKS
: Number of DB2 aborts (SYNCPOINT ROLLBACK) for transactions in this DB2Entry object since the DB2 connection was started.

AUTHORIZATIONS
: Number of DB2 authorization calls for transactions in this DB2Entry object since the DB2 connection was started.

Total Transactions
: Actual number of transactions that have been executed under this DB2Entry object.

THREAD COUNTS:

Current Threads
: Number of threads currently connected to DB2 for this DB2Entry object.

HWM Threads
: High-water mark of threads requested for this DB2Entry object.

Thread Limit
The THREADLimit parameter controls the maximum number of threads that can be active for this DB2Entry object.

If this threshold is exceeded, all new requests are required to wait for a thread, are diverted to use pool threads, or are terminated.

Protected Threads
Number of threads currently protected for this DB2Entry object. The maximum value is specified by the PROtectnum parameter (see “Protected Thread Limit” below).

Protected threads are checked for activity every purge cycle (see “THREAD PURGE TIME” in the CICSR analyzer on page 225). If the thread is inactive for more than two purge cycles, this thread is allowed to decay. Any threads in excess of the PROtectnum value will terminate when the transaction ends, and thus, are not protected.

HWM Protected Threads
Highest number of protected threads that have been used by this DB2Entry object.

Protected Thread Limit
Number of protected threads defined in this DB2Entry object. This option is defined by the PROtectnum parameter.

Protected threads are checked for activity every purge cycle (see “THREAD PURGE TIME” in the CICSR analyzer on page 225). If the thread is inactive for more than two purge cycles, this thread is allowed to decay. Any threads in excess of the PROtectnum value will terminate when the transaction ends, and thus, are not protected.

Thread Reuse Count
Number of times a thread was reused in this DB2Entry object.

Thread Terminations
Number of times a thread was terminated in this DB2Entry object.

Number of WAITS / Number of OVERFLOWS
Total number of times a request had to wait for a thread or was overflowed to a pool thread.

TASK (TCB) COUNTS:

Current Tasks
Number of MVS subtasks (TCBs) that are currently assigned to service this DB2Entry object.

HWM for Tasks
Highest number of MVS subtasks (TCBs) that were concurrently assigned to service this DB2Entry object.

Tasks on ReadyQ
Number of TCBs waiting to be reassigned under this DB2Entry object.

HWM Tasks on ReadyQ
Maximum number of subtasks (TCBs) that were waiting to be reassigned under this DB2Entry object.

Area 2 - Statistics for CICS/TS 1.1 and Below

This area of the panel shows statistics on DB2 calls, commits, overflows, and threads for CICS/TS 1.1 and below.

```
RCT NAME ........... DSN2CT51

--------- STATISTICS ---------
DB2 CALLS ...................0
COMMITS .....................0
READ-ONLY COMMITS ...........0
ABORTS ......................0
AUTHORIZATIONS ..............0

WAITS .......................0
CURRENT THREAD REQUESTS .....0
ACTIVE SUBTASKS .............2
MAX THREAD REQUESTS .........0
THREAD REUSE ................0
TCBS ATTACHED ...............4
```

where

RCT NAME
: Name of the Resource Control Table (RCT) currently in use.

DB2 CALLS
: Number of DB2 calls made by transactions in this group since the DB2 connection was started or restarted.

COMMITS
: Number of DB2 commits for transactions in this group since the DB2 connection was started (two-phase commits).

READ-ONLY COMMITS
: Number of DB2 READ-ONLY commits for transactions in this group since the DB2 connection was started (single-phase commits).

ABORTS
: Number of DB2 aborts for transactions in this group since the DB2 connection was started.

AUTHORIZATIONS
: Number of DB2 authorization calls for transactions in this group since the DB2 connection was started.

WAITS/OVERFLOWS

Total number of times a request had to wait for a thread or overflowed to a pool thread.

This column reports the number of times the number of concurrent requests in any RCT group exceeded its THRDA value. When this occurs, the request is either queued or overflowed to the RCT pool as determined by the TWAIT parameter. Either action causes a degradation of transaction throughput.

Recommendation:

Review the workload in this RCT group. If the usual situation is a high number of waits or overflows, consider increasing the thread resources available to this group (increase THRDA).

A note of caution: The figures reported here are maintained for the life of the CICS Attachment Facility. Unusual peaks of activity can produce misleading numbers. Watch this value over a reasonable time before making changes.

CURRENT THREAD REQUESTS

Number of current thread requests. An asterisk to the right of this field indicates that some thread requests are queued or have overflowed to the pool.

ACTIVE SUBTASKS

Number of MVS subtasks currently active for this group. This may be less than the THRDS value if CICS had to terminate subtasks because the THRDMAX-2 limit was reached.

MAX THREAD REQUESTS

High-water mark of threads requested for this group.

THREAD REUSE

Number of times a thread was reused in this RCT group (CICS 5.1.0 and later only).

This count is available only with CICS 5.1.0 and this column is not shown if the CICS system is less than Release 5.

TCBS ATTACHED

Number of MVS TCBs that have been attached in this RCT group (CICS 5.1.0 and later only).

This count is available only with CICS 5.1.0 and this column is not shown if the CICS system is less than Release 5.

Area 3 - TRANIDS Information

This area of the panel shows a list of transaction IDs.

```
TRANIDS..........(TXID) DTST D8CS
```

where

TRANIDS

For CICS/TS 1.1 and below, this area displays the list of transaction IDs (TXID) in this group. Additional lines are used if necessary to list all the transactions in the group.

For CICS/TS 1.2 and later, this area displays transaction IDs (DB2Tran objects) that can use this DB2Entry object. Additional lines will be used if necessary to list all the transactions, up to a maximum of 50 transactions. If more than 50 transactions have been defined, use the CICST service.

Area 4 - Thread Resource Information

This area of the panel displays the thread resource information. It shows the CPU balance between subtasks and whether a particular thread is being reused.

The total TCB CPU time gives you an estimate of the amount of work being performed by each thread. If some threads have very little CPU time, you have probably dedicated too many threads to this RCT entry.

A thread is reused when a request for the same PLAN and AUTHID arrives before the thread purge time limit is reached (see THREAD PURGE TIME on the CICSR service). If the PLAN or AUTHID changes, the current thread is terminated and a new thread created. If the thread purge time is exceeded before the next transaction arrives, the thread is terminated.

If the subtask has a thread that is active, the number of commits since the thread was created is shown. If a trancode performs only one commit per execution, then this commit count represents the number of times this thread is reused.

```
- - - - - - - - - - - - - - THREAD RESOURCE ANALYSIS - - - - - - - - - - - - -

                        ---SINCE CREATE THREAD---
THD# P STATUS   TOT CPU #COMMITS #ABORTS  ELAPSED TXID PLAN      TASK USERID
---- - ------- -------- -------- ------- -------- ---- -------- ----- --------
   0 P CONN       14 ms
   1 P CONN       19 ms
********************************* END OF DATA *********************************
```

where

THD# P
: Subtask number within this RCT entry relative to 0.

  Threads that are protected with the *THDS* specification in the RCT are flagged with a P in the protected (P) column (CICS/TS 1.1 and below only).

STATUS
: Status of the DB2 connection for this subtask. Possible values are

ACTIVE	Create thread has been performed and a transaction is currently active.
WAITING	Create thread has been performed and the thread is waiting for another transaction. If the thread purge limit is reached before a transaction arrives, the thread is terminated.
CONN	Subtask is connected to DB2 but create thread has not been performed.
QUEUED	Subtask is connected to DB2 but create thread has been queued in DB2 due to a lack of resources. For example, this situation could occur when the number of CICS threads exceeds the DB2 CTHREAD value.

TOT CPU
: Total accumulated CPU time since this subtask was created.

#COMMITS SINCE CREATE THREAD
Number of commits issued by the trancode since the thread was created. This field is blank if the thread has been terminated or Accounting Level 1 statistics have not been set.

If TOKENE=YES, this field shows only the number of commits for the current transaction.

This number represents the number of times the thread was reused if TOKENE=NO and the transaction issues one commit per invocation.

#ABORTS SINCE CREATE THREAD
Number of aborts issued by the trancode since the thread was created. This field is blank if the thread has been terminated or Accounting Level 1 statistics have not been set.

If TOKENE=YES, this field shows only the number of aborts for the current transaction.

ELAPSED SINCE CREATE THREAD
Elapsed time since the thread was created. This field is blank if the thread has been terminated or Accounting Level 1 statistics have not been set.

If TOKENE=YES, this field shows only the elapsed time of the current transaction.

If the status is QUEUED, the elapsed time shown represents the time the task has been active since the start of this unit of recovery. In most cases this time will be very close to the time the task has been waiting in DB2.

TXID
Shows which of the transactions assigned to this RCT entry is using this thread. This field is blank if the thread has been terminated.

PLAN
Shows the PLAN currently in use for this thread, even those assigned by a PLAN allocation exit routine. This field is blank if the thread has been terminated.

TASK
Task number of the current transaction. This field is blank if no transaction is active.

USERID
ID of the user requesting the transaction. This is the eight-byte user ID if available; otherwise, the operator ID from the CICS sign-on facility is used. This field is blank if no transaction is active or the operator has not invoked the CICS sign-on facility.

CICST—CICS DB2 RCT Transactions

This display shows all possible transactions that are defined for the given DB2Entry object of the CICS/DB2 Attachment Facility.

```
BOOLE AND BABBAGE----------   CICS DB2 RCT TXIDS    -------------  RX AVAILABLE
SERV ==> CICST           INPUT    15:21:14  INTVL=> 5  LOG=> N  TGT==> DB2HHH
PARM ==> CICS52C1,H000                        ROW     1 OF    10 SCROLL=> CSR
EXPAND:  USERS, CMRTASK

DB2Entry Name ...............H000          DB2CONN Name ............CICS52C1
CICS CONNECT ID ............RCTHH          CICS AUTHID .............CICS52C1

- - - - - - - - - - - - - - - TRANSACTION LIST- - - - - - - - - - - - - - - - -
 TRANID..USED    TRANID..USED    TRANID..USED    TRANID..USED    TRANID..USED
 ------------    ------------    ------------    ------------    ------------
 H000......NO    H001......NO    H002......NO    H003......NO    H004......NO
 H005......NO    H006......NO    H007......NO    H008......NO    H009......NO
 H010......NO    H011......NO    H012......NO    H013......NO    H014......NO
 H015......NO    H016......NO    H017......NO    H018......NO    H019......NO
 H020......NO    H021......NO    H022......NO    H023......NO    H024......NO
 H025......NO    H026......NO    H027......NO    H028......NO    H029......NO
 H030......NO    H031......NO    H032......NO    H033......NO    H034......NO
 H035......NO    H036......NO    H037......NO    H038......NO    H039......NO
 H040......NO    H041......NO    H042......NO    H043......NO    H044......NO
 H045......NO    H046......NO    H047......NO    H048......NO    TSM3.....YES
********************************* END OF DATA *********************************
```

Figure 42. CICS DB2 RCT Transactions

Select Code:

CICST

Parameter:

The following parameters are required for this service. If the parameter is invalid, an error message is returned.

- CICS connection id

  DB2 connection name used by this CICS region. It is the same as the CICS VTAM APPLID.

- db2entry name

  Name of this DB2Entry object.

Description:

This display shows all possible transactions that are defined for the given DB2Entry object of the CICS/DB2 Attachment Facility. All transactions that have been used are highlighted.

CICSE shows the first 50 defined transactions. You can use this display to see the complete list of transactions when more than 50 transactions are defined.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the transaction displayed and the total number of transactions that can be displayed in a scrollable list. For example:

```
ROW    1 OF 2
```

Expand:

The CICS DB2 RCT Transactions display can be EXPANDed to the following displays:

USERS

User Summary display with a parameter of CICS to show only the active CICS connections.

CMRTASK

MAINVIEW for CICS DB2 Task display for all tasks accessing DB2 from the target CICS system.

Note: If MAINVIEW for CICS is not accessible, this EXPAND button is not highlighted and cannot be selected.

Area 1 - Connection Information

This area of the panel shows general connection information.

```
DB2Entry Name ...............H000          DB2CONN Name ............CICS52C1
CICS CONNECT ID ............RCTHH          CICS AUTHID .............CICS52C1
```

where

DB2Entry Name
: Name of the CICS Resource Definition Online (RDO) object that describes a group of connections to DB2 for a given plan. This name is derived either from the macro level Resource Control Table (RCT) or from the installed RDO definition.

CICS CONNECT ID
: DB2 connection name that this CICS region used to identify itself to DB2. By default, this name is the VTAM APPLID for this CICS system.

DB2CONN Name
: Name of the CICS Resource Definition Online (RDO) object that describes the DB2 CICS connection. This name is derived either from the macro level Resource Control Table (RCT) or from the installed RDO definition.

CICS AUTHID
: DB2 authorization ID for this CICS region. This value is specified in the SIGNID parameter of the DSNCRCT TYPE=INIT statement or the definition of the DB2CONN object. If SIGNID is not specified, this ID defaults to the VTAM APPLID of the CICS system.

Area 2 - Transaction List

This area of the panel shows all the transaction IDs associated with this DB2Entry object.

Note: All transactions that have been used are highlighted.

```
 - - - - - - - - - - - - - - - TRANSACTION LIST- - - - - - - - - - - - - - - - -
 TRANID..USED    TRANID..USED    TRANID..USED    TRANID..USED    TRANID..USED
 ------------    ------------    ------------    ------------    ------------
 H000......NO    H001......NO    H002......NO    H003......NO    H004......NO
 H005......NO    H006......NO    H007......NO    H008......NO    H009......NO
 H010......NO    H011......NO    H012......NO    H013......NO    H014......NO
 H015......NO    H016......NO    H017......NO    H018......NO    H019......NO
 H020......NO    H021......NO    H022......NO    H023......NO    H024......NO
 H025......NO    H026......NO    H027......NO    H028......NO    H029......NO
 H030......NO    H031......NO    H032......NO    H033......NO    H034......NO
 H035......NO    H036......NO    H037......NO    H038......NO    H039......NO
 H040......NO    H041......NO    H042......NO    H043......NO    H044......NO
 H045......NO    H046......NO    H047......NO    H048......NO    TSM3.....YES
*********************************** END OF DATA ***********************************
```

where

TRANID
: Name of the CICS transaction that can use this DB2Entry object.

USED
: YES|NO. Indicates whether this transaction ID has been used since the time the CICS/DB2 Attachment Facility was started.

Chapter 12. Lock Displays

This chapter describes the analyzer display services that provide lock contention information about a targeted DB2 system.

LOCKD—Lock Contention by DB/TS

The DB2 Lock Status screen is used to determine which objects and transactions have problems.

```
BOOLE AND BABBAGE----------LOCK CONTENTION BY DB/TS -----------PERFORMANCE MGMT
SERV ==> LOCKD            INPUT   21:48:26  INTVL=> 3  LOG=> N  TGT==> DB2A
PARM ==> ,H                                 ROW      1 OF     31 SCROLL=> CSR
EXPAND:  MON(LOCK), DBTS, LKOUT, LOCKU, LINESEL(LOCKE)
- - - - - OBJECT - - - - -  - LOCK -   - - LOCK OWNER - -  WAIT  - WAITING -
DATABASE  TSPACE  PAGE/PART TYPE STAT  USER ID  C   PLAN   CNT
-------- -------- -------- ----- ----  -------- - -------- ---- --------------
$$PLAN   BATLGEN            SKCT SHRD  SHR-CNT  = 003        0
$$PLAN   DB2CAFT2           SKCT SHRD  CIR4     X DB2CAFT2   0
$$PLAN   DSNESPCS           SKCT SHRD  HTS2     T DSNESPCS   0
$$PLAN   DSN8IC13           SKCT SHRD  DSN8IC13 I DSN8IC13   0
$$PLAN   GMBPLAN            SKCT SHRD  SHR-CNT  = 002        0
DSNDB01                     DBTS SHRD  DB2LOAD2 B GMBPLAN    0
DSNDB01  DBD01              PSET ISHR  DB2LOAD2 B GMBPLAN    0
DSNDB01  SCT02              PSET ISHR  DB2LOAD2 B GMBPLAN    0
DSNDB06                     DBTS SHRD  HTS2     T DSNESPCS   0
DSNDB06  SYSDBASE           PSET ISHR  HTS2     T DSNESPCS   0
DSNDB06  SYSGROUP           PSET IEXC  HTS2     T DSNESPCS   0
DSNDB07                     DBTS SHRD  DSN8IC13 I DSN8IC13   0
DSNDB07  DSNTMP01           PSET IEXC  DSN8IC13 I DSN8IC13   0
DSN8D13A          00000201  IPAG SHRD  DSN8IC13 I DSN8IC13   0
DSN8D13A          00000201  IPAG SHRD  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13D 000002    DPAG SHRD  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13D           PSET ISHR  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13E       01  DSET ISHR  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13E 000002    DPAG SHRD  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13E       02  DSET ISHR  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13E       03  DSET ISHR  DSN8IC13 I DSN8IC13   0
DSN8D13A DSN8S13E       04  DSET ISHR  DSN8IC13 I DSN8IC13   0
DSN8D13P DSN8S13C           PSET ISHR  DSN8IC13 I DSN8IC13   0
LOADDB1                     DBTS SHRD  HTS2     T DSNESPCS   0
LOADDB1  HTSTS2   00000C    DPAG EXCL  HTS2     T DSNESPCS   0
LOADDB1  HTSTS2   00000D    DPAG EXCL  HTS2     T DSNESPCS   0
LOADDB1  HTSTS2   00000E    DPAG EXCL  HTS2     T DSNESPCS   1  LOADDB2-B
LOADDB1  HTSTS2   00000A    DPAG EXCL  HTS2     T DSNESPCS   0
LOADDB1  HTSTS2   00000B    DPAG EXCL  HTS2     T DSNESPCS   0
LOADDB1  HTSTS2             PSET IEXC  HTS2     T DSNESPCS   0
LOADDB3  LOADTS9            PSET EXCL  DB2LOAD2 B GMBPLAN    0
```

Figure 43. DB2 Lock Status Screen

By default, this panel only shows locks that have current waiters.

Select Code:
LOCKD

Parameter:

Database and table space lookup can be done system-wide, by specific object, or by object group with an object name qualifier.

One of the following parameters can be specified. If no parameters are entered, all databases and all table spaces holding locks that currently have waiters are displayed.

S database

Selects the specified database for display.

A generic group of databases can be selected for display.

For example:

```
S XYZ+
```

where the plus sign (+) indicates any character.

S database,table space

Selects the specified database and associated table space for display.

A generic group of table spaces can be selected for display by using the + qualifier.

For example:

```
S +,XYZ+
```

shows all table spaces with an XYZ prefix and their associated databases.

F database

Finds the specified database and displays it at the top of the list. The plus sign (+) can be used as a generic qualifier to represent any character in the database name.

F database,table space

Finds the specified database and associated table space and displays them at the top of the list. The plus sign (+) can be used as a generic qualifier to represent any character in the database or table space name.

,H

Displays all held locks.

,W

Displays all locks currently having waiters. This is the default.

Parameters ,H and ,W can be specified with the S and F parameters as follows:

S database,[,H|W]
S database,table space[,H|W]
F database,[,H|W]
F database,table space[,H|W]

,PLAN

Replace the authorization ID in the WAITING field with the plan name.

,CORRID

Replace the authorization ID in the WAITING field with the correlation name.

Description:

This display is used to determine which objects and transactions have contention problems. You can also determine who holds exclusive locks on each table space and who is currently waiting because of lock contention.

The database and table space presentation is sorted by DATA BASE, TABLE SPACE, and PAGE/PART.

This list is scrollable.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first lock displayed and the total number of locks that can be displayed in the scrollable list.

For example:

```
ROW   1 OF  1,167
```

Expand:

The LOCKD display can be EXPANDed to the following displays:

MON(LOCK)
: Active Timer Requests display of all active monitors in the resource or user lock (LOCK) area

DBTS
: Database and Table Space Status display

LKOUT
: Lockout History display

LOCKU
: Lock Contention by User display

LINESEL(LOCKE)
: A detailed display of information about a specific user (LOCKE) can be selected from this list by positioning the cursor on the line for that user and pressing ENTER.

Area 1 - Object Description

The following three columns qualify the object of a lock:

```
- - - - - OBJECT - - - - -
DATABASE  TSPACE  PAGE/PART
-------- -------- --------
DSNDB01  SCT02
DSNDB06
DSNDB06  SYSDBASE
DSNDB06  SYSGROUP
DSNDB07
DSNDB07  DSNTMP01
DSN8D13A          00000201
DSN8D13A          00000201
DSN8D13A DSN8S13D 000002
DSN8D13A DSN8S13D
DSN8D13A DSN8S13E       01
```

where

DATABASE
: Database name of the locked object.

  Depending on the type of object or type of lock, this field can be blank.

TSPACE
: Table space name of the locked object.

  Depending on the type of object or type of lock, this field can be blank.

  Table space name is qualified by database name.

PAGE/PART
: Depending on the type of object or type of lock, this field contains one of the following:

- Locked page
- Locked partition
- Blank

When the page number is displayed, the first six digits refer to the page that is locked. If there is a row lock or an index subpage, it is defined by two additional digits, for example:

000002 refers to page 000002
00000201 refers to page 000002, index subpage 01
00002103 refers to page 000021, record ID (RID) 03

For large objects, the page number is increased to eight digits. A locked page or locked partition using a row lock or index subpage lock has two additional digits. For example:

00000002 refers to page 00000002
0000000201 refers to page 00000002, index subpage 01
000000210A refers to page 00000021, record ID (RID) 0A (10)

When this field contains the partition number that is locked, only two digits are displayed; for example:

0F refers to partition number 15

For skeleton package table locks and collection locks, these three columns are used to display the 18-character collection ID followed by the 8-character package ID.

Area 2 - Lock Description

This area shows the lock characteristics as

```
 - LOCK -
 TYPE STAT
----- ----
 SKCT SHRD
 DBTS SHRD
 PSET ISHR
 PSET ISHR
 DBTS SHRD
 PSET ISHR
 PSET IEXC
```

where

TYPE This field can be

ALBP	ALTER BUFFERPOOL lock.
CATC	CATMAINT convert catalog lock.
CATD	CATMAINT convert directory lock.
CATM	CATMAINT migration lock.
CDBP	DDF Communications Database (CDB) P-lock.
CLKT	Collection lock. DATABASE field contains the collection ID name.
DBDP	Database Descriptor (DBD) P-lock.
DBEX	Database group exception LPL/GRECP lock.
DBTS	Database lock (on DBD).
DBUP	Database group exception update lock.
DCMS	Database command serialization (DB2 5.1 and later).
DPAG	Data page lock.
DRCS	Cursor Stability drain lock.
DRRR	Repeatable read drain lock.
DRWR	Write drain lock.
DSET	Data set lock (LOCKPART on table space is NO).
GBPP	Group buffer pool level castout P-lock.
HASH	Hash anchor lock.
IEOF	Index end-of-file lock.
IPAG	Index page lock.
IXTP	Index tree P-lock.
MASD	Mass delete lock.
PAGP	Page P-lock.
PART	Partition lock (DB2 5.1 and later).
PDSO	Page set or data set open/close lock.
PSCP	Page set or partition level castout P-lock.
PSET	Page set (table space).
PSPI	Page set piece lock.
PSPP	Page set or partition P-lock.
RBND	Autobind or remote bind lock.
RGDA	Retry GETPAGE during abort.
RLFP	Resource Limit Facility (RLF) P-lock.
ROW	Data row lock.
RPDB	Repair DBD test/diagnose.
SCAR	Shared Communications Area (SCA) access for restart or redo information.

SDBA	Start/Stop lock on DBA table by DDL.
SGBP	Group buffer pool start and stop lock.
SKCT	Skeleton Cursor Table (plan).
SKPT	Skeleton Package Table lock. DATABASE/TSPACE fields contain the collection ID plus the DBRM name.
SREC	Buffer Manager SYSLGRNG recording lock (for the duration of SYSLGRNG update).
TABL	Table lock.
UIDA	Utility I/O damage assessment.
UNKN	Unknown (undefined lock).
UTEX	Utility exclusive execution lock.
UTID	Utility UID lock.
UTIL	Utility serialization lock.
32DP	32K desperation pool lock.

See the IBM *DB2 Administration Guide* and the IBM *DB2 Application Programming Guide and SQL Guide* for a further explanation of DB2 locks.

STAT This field can contain one of the following eight values:

SHRD	Shared
SHR	Unprotected Share
ISHR	Intent for Share
SIX	Share with Intent for Exclusive
UPD	Update
IEXC	Intent for Exclusive
EXCL	Exclusive
NSUP	Non-shared Update

Area 3 - Lock Owner

The following three fields qualify the owner of the lock:

```
- - LOCK OWNER - -
USER ID  C   PLAN
-------- - --------
SHR-CNT  = 003
CIR4     X DB2CAFT2
HTS2     T DSNESPCS
DSN8IC13 I DSN8IC13
SHR-CNT  = 002
DB2LOAD2 B GMBPLAN
DB2LOAD2 B GMBPLAN
DB2LOAD2 B GMBPLAN
HTS2     T DSNESPCS
HTS2     T DSNESPCS
```

where

USER ID User ID of the lock owner.

The contents of this field depend on the connection type, as follows:

Value	Connect Type
jobname (TSO logon ID)	TSO and batch
DB2 authorization ID	IMS and CICS
IRLM/XES	Global lock held by another member of the data sharing group

C A character in this field represents the connection type (Attach mode) of the lock owner, which can be

I	IMS
C	CICS
T	TSO
B	Batch
X	Call Attach Facility
U	Utility
D	Database access thread (DBAT)
S	DB2 internal system task

Note: SHR-CNT = nnnn indicates that shared locks are held on an object by several users; nnnn is the number of users.

PLAN DB2 plan name of the lock owner.

Area 4 - Waiting Users

The last two columns display the number and IDs of users waiting for this object.

```
                                        WAIT  - WAITING -
                                        CNT
                                        ---- --------------
                                        0
                                        0
                                        0
                                        0
                                        0
                                        0
                                        1  LOADDB2-B
                                        0
                                        0
                                        0
                                        0
```

where

WAIT CNT
: Number of users waiting for the locked object to be released.

WAITING
: IDs of the users waiting for the locked object to be released and their connection type as

```
userid-c
```

where c can be

I	IMS
C	CICS
T	TSO
B	Batch
X	Call Attach Facility
U	Utility
D	Database access thread (DBAT)
S	DB2 internal system task

If there is more than one user waiting for a locked object, as many user IDs as can fit in the WAITING field for that object are displayed, starting with the first queued user ID.

Note: Userid can be replaced by plan name or correlation name with a parameter specification to better identify CICS or IMS users.

LOCKU—Lock Contention by User (Summary)

The DB2 User Lock Summary screen is used to determine which users are experiencing or causing locking problems.

```
BOOLE AND BABBAGE----------LOCK CONTENTION BY USER  -----------PERFORMANCE MGMT
SERV ==> LOCKU            INPUT   17:18:14  INTVL=> 3  LOG=> N  TGT==> DB2A
PARM ==>                                    ROW      1 OF      3 SCROLL=> CSR
EXPAND:  MON(LOCK), LOCKD, LKOUT, LINESEL(LOCKE),
 - - - - - - - USER - - - - - - - - -      -  LOCKS HELD - -      WAIT    IN
 USER ID  CONNECT    PLAN   CORRELATION      SHARED  EXCLUSIVE    COUNT  WAIT
 -------- -------- -------- ------------    -------- ---------   ------- ----
 AMR1     TSO      DSNESPRR AMR1                  4         1         1
 CIR4X    TSO      DSNESPRR CIR4X                 6         1         0  *
 DSN8IC13 X14H     DSN8IC13 0002DSN8IC13          1         0         0
 DSN8IH13 X14H     DSN8IH13 0001DSN8IH13         10         0         0
```

Figure 44. DB2 User Lock Summary Screen

Select Code:
LOCKU

Parameter:
None

Description:
The User Lock Summary screen, shown in Figure 44, is used to determine which users are experiencing or causing locking problems.

The user lock summary is sorted by user ID, connection type, and plan.

If the user list does not fit on one screen, it can be scrolled.

Service Message(s):
A message in the parameter field of the service shows the sequence number of the first user ID displayed and the total number of user IDs that can be displayed in a scrollable list.

For example:

```
ROW  1 OF  38
```

Expand:
The LOCKU display can be EXPANDed to the following displays:

MON(LOCK)
Active Timer Requests display of all active monitors in the resource or user lock (LOCK) area.

LOCKD
Lock Contention by DB/TS display.

LKOUT
Lockout History display.

LINESEL(LOCKE)
A detailed display of lock contention information about a user (LOCKE) can be selected by positioning the cursor on the line for that user and pressing ENTER.

Area 1 - Information

If the displayed user ID is waiting to obtain a lock, the entire line is highlighted.

```
- - - - - - - USER - - - - - - - - - -      -  LOCKS HELD - -      WAIT    IN
USER ID  CONNECT    PLAN   CORRELATION      SHARED  EXCLUSIVE    COUNT  WAIT
-------- -------- -------- ------------    -------- ---------   ------- ----
AMR1     TSO      DSNESPRR AMR1                   4         1         1
CIR4X    TSO      DSNESPRR CIR4X                  6         1         0  *
DSN8IC13 X14H     DSN8IC13 0002DSN8IC13           1         0         0
DSN8IH13 X14H     DSN8IH13 0001DSN8IH13          10         0         0
```

where

USER ID
User ID of the lock owner or requestor.

The contents of this field depend on the connection type, as follows:

Value	**Connect Type**
jobname (TSO logon ID)	TSO and batch
DB2 authorization ID	IMS and CICS

CONNECT
Connection type (Attach mode) of the user, which can be

- IMS subsystem ID
- CICS ID
- TSO
- BATCH
- DB2CALL (Call Attach Facility)
- UTILITY
- SERVER

PLAN
DB2 plan name in use by the user.

CORRELATION
Correlation ID of the user thread.

LOCKS HELD SHARED
Number of SHARED locks currently held by this user.

Note: This count is not displayed on the User Lock Detail screen.

LOCKS HELD EXCLUSIVE
Number of EXCLUSIVE locks currently held by this user.

Note: This count is not displayed on the User Lock Detail screen.

WAIT COUNT
Number of users waiting for locks currently held by this user.

Note: This count is not displayed on the User Lock Detail screen.

IN WAIT
An asterisk (*) in this column indicates that the user is waiting to obtain a lock. In addition, the entire line is highlighted.

LOCKE—Lock Contention by User (Detail)

The DB2 User Lock Detail screen is used to determine how a specific user is experiencing or causing locking problems.

```
BOOLE AND BABBAGE---------  LOCK CONT USER DETAIL  ------------PERFORMANCE MGMT
SERV ==> LOCKE           INPUT    09:47:19  INTVL=> 3  LOG=> N  TGT==> DB2A
PARM ==> CIR4X                                ROW     1 OF     8 SCROLL=> CSR
EXPAND:  MON(LOCK), DUSER, DREGN
ID:CIR4X        CONNECT:TSO        ~
PLAN:DSNESPRR     CORRELATION:CIR4X
- - - - - OBJECT - - - - -  - LOCK - HOLD/WAIT
DATABASE  TSPACE PAGE/PART  TYPE STAT  COUNT  HOLDERS/WAITERS
-------- -------- --------  ---- ---- ------- ---------------------------------
-------------(WAITING)--------------- --------(HOLDERS)------------------------
DSN8D13A DSN8S13E       01  DSET EXCL       1 AMR1    -T
-------------(HOLDING)--------------- --------(WAITERS)------------------------
$$PLAN   DSNESPRR           SKCT SHRD       0
DSNDB06                     DBTS SHRD       0
DSNDB06  SYSDBASE           PSET IEXC       0
DSNDB06  DSNDTX01 00000A    IPAG SHRD       0
DSNDB06  SYSDBASE 000034    DPAG SHRD       0
DSNDB06  DSNDSX01 000005    IPAG SHRD       0
DSN8D13A                    DBTS SHRD       0
```

Figure 45. DB2 User Lock Detail Screen

Select Code:

LOCKE

Parameter:

One of the following parameters can be specified to identify the user to be displayed on the User Lock Detail screen:

- Correlation ID
- User ID, which can be

Value	Connect Type
jobname (TSO logon ID)	TSO and batch
DB2 authorization ID	IMS and CICS

Description:

This display is used to determine how this user is experiencing or causing locking problems. It lists the objects with locks for this user and shows the IDs of users waiting for or holding a lock on an object. Positioning the cursor on the line of the user ID within the User Lock Summary screen (Figure 45 on page 261) and pressing the ENTER key produces this same display.

The HOLDERS/WAITERS area of the screen is presented in two parts: a WAITING section and a HOLDING section. The WAITING section is shown first if the user is waiting to obtain any lock(s). The HOLDING section shows the locks that this user is currently holding.

The HOLDING section objects are sorted and displayed by the highest wait count first, then by database name, followed by table space name, and finally by page or part number. Thus, objects with users waiting for a lock held by this user are displayed before those with no users waiting. If the list does not fit on one screen, it can be scrolled.

Note: The WAITING section of the HOLDERS/WAITERS area shows HOLD count and HOLDERS data. The HOLDING section shows WAIT count and WAITERS data (see “Area 3 - Waiting or Holding Details” on page 266).

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first lock displayed and the total number of locks that can be displayed in a scrollable list. For example:

```
ROW   1 OF  12
```

Expand:

The LOCKE display can be EXPANDed to the following displays:

MON(LOCK)
: Active Timer Requests display of all active monitors in the resource or user lock (LOCK) area

DUSER
: Detail User Status display

DREGN
: MAINVIEW for IMS Detail Region display for the region related to this DB2 thread, if MAINVIEW for IMS is installed (for IMS threads only)

Note: If MAINVIEW for IMS is not accessible, this EXPAND button is not highlighted and cannot be selected.

CMRTASK
: MAINVIEW for CICS DB2TASK display, which lists all current CICS/DB2 tasks, if MAINVIEW for CICS is installed (for CICS threads only)

Note: If MAINVIEW for CICS is not accessible, this EXPAND button is not highlighted and cannot be selected.

Area 1 - Object Description

Three columns qualify the object of a lock:

```
- - - - - OBJECT - - - - -
DATABASE  TSPACE  PAGE/PART
-------- -------- --------
$$PLAN   DSNESPRR
DSNDB06
DSNDB06  SYSDBASE
DSNDB06  DSNDTX01 00000A
DSNDB06  SYSDBASE 000034
DSNDB06  DSNDSX01 000005
DSN8D13A
```

where

DATABASE
: Database name of the locked object.

  Depending on the type of object or type of lock, this field may be blank.

TSPACE
: Table space name of the locked object, which is qualified by the database name.

  Depending on the type of object or type of lock, this field may be blank.

PAGE/PART
: Depending on the type of object or type of lock, this field contains one of the following:

- Locked page
- Locked partition
- Blank

When the page number is displayed, the first six digits refer to the page that is locked. If there is a row lock or an index subpage, it is defined by two additional digits.

For example:

000002 refers to page 000002
00000201 refers to page 000002, index subpage 01
00002103 refers to page 000021, record ID (RID) 03

For large objects, the page number is increased to eight digits. A locked page or locked partition using a row lock or index subpage lock has two additional digits. For example:

00000002 refers to page 00000002
0000000201 refers to page 00000002, index subpage 01
000000210A refers to page 00000021, record ID (RID) 0A (10)

When this field contains the partition number that is locked, only two digits are displayed.

For example:

0F refers to partition number 15

For skeleton package table locks and collection locks, these three columns are used to display the 18-character collection ID followed by the 8-character package ID.

Area 2 - Lock Description

This area shows the lock characteristics as follows:

```
- LOCK -
TYPE STAT
---- ----
SKCT SHRD
DBTS SHRD
PSET IEXC
IPAG SHRD
```

where

TYPE
This field can be one of the following:

ALBP	ALTER BUFFERPOOL lock.
CATC	CATMAINT convert catalog lock.
CATD	CATMAINT convert directory lock.
CATM	CATMAINT migration lock.
CDBP	DDF Communications Database (CDB) P-lock.
CLKT	Collection lock. DATABASE field contains the collection ID name.
DBDP	Database Descriptor (DBD) P-lock.
DBEX	Database group exception LPL/GRECP lock.
DBTS	Database lock (on DBD).
DBUP	Database group exception update lock.
DCMS	Database command serialization (DB2 5.1 and later).
DPAG	Data page lock.
DRCS	Cursor Stability drain lock.
DRRR	Repeatable read drain lock.
DRWR	Write drain lock.
DSET	Data set lock (LOCKPART on table space is NO).
GBPP	Group buffer pool level castout P-lock.
HASH	Hash anchor lock.
IEOF	Index end-of-file lock.
IPAG	Index page lock.
IXTP	Index tree P-lock.
LOB	Large object lock (DB2 6.1 and later).
MASD	Mass delete lock.
PAGP	Page P-lock.
PART	Partition lock (DB2 5.1 and later).
PDSO	Page set or data set open/close lock.
PSCP	Page set or partition level castout P-lock.
PSET	Page set (table space).
PSPI	Page set piece lock.
PSPP	Page set or partition P-lock.
RBND	Autobind or remote bind lock.
RGDA	Retry GETPAGE during abort.
RLFP	Resource Limit Facility (RLF) P-lock.
ROW	Data row lock.
RPDB	Repair DBD test/diagnose.
SCAR	Shared Communications Area (SCA) access for restart or redo information.
SDBA	Start/Stop lock on DBA table by DDL.

SGBP	Group buffer pool start and stop lock.
SKCT	Skeleton Cursor Table (plan).
SKPT	Skeleton Package Table lock. DATABASE/TSPACE fields contain the collection ID plus the DBRM name.
SREC	Buffer Manager SYSLGRNG recording lock (for the duration of SYSLGRNG update).
TABL	Table lock.
UIDA	Utility I/O damage assessment.
UNKN	Unknown (undefined lock).
UTEX	Utility exclusive execution lock.
UTID	Utility UID lock.
UTIL	Utility serialization lock.
32DP	32K desperation pool lock.

See the IBM *DB2 Administration Guide* and the IBM *DB2 Application Programming Guide and SQL Guide* for a further explanation of DB2 locks.

STAT

This field shows the lock status for locks held by this user. If this user is waiting for a lock on an object, the STAT field shows the status of the lock to be acquired. It can contain one of the following values:

SHRD	Shared
SHR	Unprotected Share
ISHR	Intent for Share
SIX	Share with Intent for Exclusive
UPD	Update
IEXC	Intent for Exclusive
EXCL	Exclusive
NSUP	Non-shared Update

Area 3 - Waiting or Holding Details

This area displays the users that are either holding a lock or waiting for a held lock on the object.

```
                                    HOLD/WAIT
                                      COUNT  HOLDERS/WAITERS
                                     ------- --------------------------------
-------------(WAITING)--------------- --------(HOLDERS)-----------------------
                                           1 CIR4    -T
-------------(HOLDING)--------------- --------(WAITERS)-----------------------
                                           0
                                           0
                                           0
                                           0
```

where

WAITING
: If this line is displayed, the data shown in the HOLDERS/WAITERS area is the ID of the user holding a lock on the object and the connection type as

```
userid-c
```

where c can be

I	IMS
C	CICS
T	TSO
B	Batch
X	Call Attach Facility
U	Utility
D	Database Access Thread
G	Global lock held by IRLM for data sharing

The user ID displayed depends on the connection type. For TSO and batch, it is the jobname (TSO logon ID). For IMS and CICS, it is the DB2 authorization ID. For a global lock, it is the character string `IRLM/XES`.

A maximum of three users can be shown in this area for each object.

The HOLD/WAIT COUNT field contains

HOLD/WAIT COUNT
: Number of users holding a lock on this field.

HOLDING
: If this line is displayed, the data shown in the HOLDERS/WAITERS area is the ID of the user waiting for a held lock on the object and the connection type as

```
userid-c
```

where c can be

I	IMS
C	CICS
T	TSO
B	Batch
X	Call Attach Facility
U	Utility
D	Database Access Thread

The user ID displayed depends on the connection type. For TSO and batch, it is the jobname (TSO logon ID). For IMS and CICS, it is the DB2 authorization ID.

A maximum of three users can be shown in this area for each object.

The HOLD/WAIT COUNT field contains

HOLD/WAIT COUNT
: Number of users waiting for the held lock.

CLAIM—Claims and Drains for Table Space Partitions

The CLAIM displays provide summary and detail status of claims and drains on objects within a selected table space.

```
BOOLE AND BABBAGE------------- CLAIM/DRAIN BY TS ----------------  RX AVAILABLE
SERV ==> CLAIM           INPUT    17:30:03  INTVL=> 5  LOG=> N  TGT==> DB2D
PARM ==> DBTS=(DSNDB06,ACT)                ROW      1 OF      4 SCROLL=> CSR
EXPAND:  MON(LOCK), LOCKD, LOCKU, LINESEL(DETAIL)

---------OBJECT------------                    ----CLAIM---- ----DRAIN----
DBNAME   TSPACE   PART TYPE STATUS              CS  RR WRITE  CS  RR WRITE WAIT
-------- -------- ---- ---- ------------------ --- --- ----- --- --- ----- ----
DSNDB06  ACT           TS   RW                   1                       1
******************************** END OF DATA ********************************
```

Figure 46. Claim/Drain for Table Space Panel

Select Code:

CLAIM

Parameter:

The following parameter (with both operands) is required for this service. If the parameter is invalid, an error message is returned.

DBTS=(dbname,tsname)

Selects all partitions or data sets of the table space, where dbname and tsname are the names of the database and table space.

Description:

The purpose of this display is to show the status of all partitions within a table space to simplify utility scheduling with the partition independence feature of DB2.

This display is usually accessed with line selection from DBTS, since both dbname and tsname are required as parameters for CLAIM.

The summary display lists all partitions for the selected table space, showing the current number of claims and drains by class and the number of waiters for a drain lock (highlighted if not zero).

The database and table space presentation is sorted by DBNAME, TSNAME, and PART.

This list is scrollable.

Service Message(s):

A message in the parameter field of the service shows the sequence number of the first object displayed and the total number of objects that can be displayed in the scrollable list; for example:

```
ROW 1 OF 25
```

Expand:

The CLAIM display can be EXPANDed to the following displays:

MON(LOCK)
: Active Timer Requests display of all active monitors in the resource or user lock (LOCK) area

LOCKD
: Lock Contention by DB/TS

LOCKU
: Lock Contention by User

LINESEL(DETAIL)
: A detailed display of information about a specific object (table space partition or data set) can be selected from this list by positioning the cursor on the line for that object and pressing ENTER.

Area 1 - Claims and Drains for Table Space Partition

The following fields display the number of claims and drains on this partition, and whether any thread is waiting for access.

```
---------OBJECT------------                    ----CLAIM---- ----DRAIN----
DBNAME   TSPACE   PART TYPE STATUS              CS  RR WRITE  CS  RR WRITE WAIT
-------- -------- ---- ---- ------------------ --- --- ----- --- --- ----- ----
DSNDB06  ACT           TS   RW                   1                       1
******************************** END OF DATA ********************************
```

where

DBNAME
: An 8-character database name, as it appears in the DB2 catalog.

TSPACE
: An 8-character table space name, defined as part of the adjacent database, as it appears in the DB2 catalog.

PART
: Partition number.

It is blank for a simple table space or simple index space. For nonpartitioned indexes on a partitioned table space, it is the logical partition number preceded by the character L (for example, L01).

TYPE
: Type can be

TS Table space
IX Index

STATUS

Current state of this object, which can be one or more of the following:

CHKP	Table space is in check pending state.
COPY	An image copy is required for this object.
DEFER	Table space or index space is marked for deferred restart.
GRECP	Object (a table space, a table space partition, index space, or index space partition) is marked recovery pending because of the failure of a group buffer pool. (This status value appears only on spaces. It does not apply to databases.)
INDBT	Indoubt processing is required.
LPL	Object has pages or ranges of pages that are unavailable because of logical or physical damage.
LSTOP	Logical partition is stopped.
OPENF	Object had an open data set failure.
PSRCP	Object is in a page set recovery pending state.
RECP	Table space or index space is in a recovery pending state.
REST	Object is currently under restart processing.
RO	Object is started for read activity only.
RW	Object is started for read and write activity.
STOP	Object is stopped.
STOPE	Table space, index space, or partition was implicitly stopped by DB2 because DB2 was unable to open the corresponding data set or because an error occurred while DB2 attempted to apply log records during restart.
STOPP	A stop is pending or in progress for this table space or index space.
UT	Table space, index space, or partition is started for utility processing only.
UTRO	Object was started RW, but a utility in process has changed access to RO.
UTRW	Object is started RW, and a utility is currently in process.
UTUT	Object was started RW, but a utility is in process and only UT access is allowed.

If more than one status occurs, as each status is cleared, the next status in sequence is displayed.

CLAIM CS

Number of Cursor Stability (CS) read class claims on this object. This allows reading only, with an isolation level of CS.

Note: A claim is a notification to DB2 that an object is being accessed.

CLAIM RR

Number of Repeatable Read (RR) read class claims on this object. This allows reading only, with an isolation level of RR.

CLAIM WRITE
: Number of Write (WR) class claims on this object. This allows reading, updating, inserting, and deleting.

DRAIN CS
: Number of Cursor Stability (CS) read class drain locks held this object (1 or blank).

A drain is the action of taking over access to an object by preventing new claims. It is implemented with a drain lock.

Note: Drain locks are also shown in the LOCKx displays.

DRAIN RR
: Number of Repeatable Read (RR) read class drain locks held on this object (1 or blank).

DRAIN WRITE
: Number of Write (WR) class drain locks held on this object.

WAIT
: Number of waiters for drain locks held on this object. The line is highlighted when the wait count is nonzero.

Claim/Drain Detail for a Partition

The display shown in Figure 47 can be viewed by tabbing to a line in the CLAIM display and pressing ENTER. This detail display shows each thread needing access to that partition. Drain waiters are shown first (since they are being delayed by contention), followed by drain lock holders and then claim holders. Within this prioritization, the threads are sorted by CORRID.

```
BOOLE AND BABBAGE------------- CLAIM/DRAIN BY TS ----------------  RX AVAILABLE
SERV ==> CLAIM           INPUT    17:30:03  INTVL=> 5  LOG=> N  TGT==> DB2D
PARM ==> DBTS=(DSNDB06,ACT),DETAIL          ROW      1 OF      4 SCROLL=> CSR
EXPAND:  MON(LOCK), LOCKD, LOCKU, LINESEL(DUSER)

DBNAME: DSNDB06. TSNAME: ACT..... PART: .... TYPE: TS
STATUS: RW................
                        ---------DRAIN-----------  ---CLAIM-----
CORRID       CONNID    STATUS MODE CLASS SCOPE    CLASS SCOPE
------------ --------  ------ ---- ----- -------  ----- -------
CIR10UTIL    UTILITY   HOLD   IX   WRITE DEALLOC
CIR10        DB2CALL                              CS    COMMIT
********************************* END OF DATA *********************************
```

Figure 47. CLAIM - Claim/Drain Detail Panel

DBNAME
: An 8-character database name, as it appears in the DB2 catalog.

TSNAME
: An 8-character table space name, defined as part of the adjacent database, as it appears in the DB2 catalog.

PART
: Partition number or data set sequence number.

TYPE
: Type can be

DB	Database
TS	Table space
IX	Index
-D	Data set
-P	Partition

STATUS
Current state of this object, which can be one or more of the following:

CHKP Table space is in check pending state.

COPY An image copy is required for this object.

DEFER Table space or index space is marked for deferred restart.

GRECP Object (a table space, a table space partition, index space, or index space partition) is marked recovery pending because of the failure of a group buffer pool. (This status value appears only on spaces. It does not apply to databases.)

INDBT Indoubt processing is required.

LPL Object has pages or ranges of pages that are unavailable because of logical or physical damage.

LSTOP Logical partition is stopped.

OPENF Object had an open data set failure.

PSRCP Object is in a page set recovery pending state.

RECP Table space or index space is in a recovery pending state.

REST Object is currently under restart processing.

RO Object is started for read activity only.

RW Object is started for read and write activity.

STOP Object is stopped.

STOPE Table space, index space, or partition was implicitly stopped by DB2 because DB2 was unable to open the corresponding data set or because an error occurred while DB2 attempted to apply log records during restart.

STOPP A stop is pending or in progress for this table space or index space.

UT Table space, index space, or partition is started for utility processing only.

UTRO Object was started RW, but a utility in process has changed access to RO.

UTRW Object is started RW, and a utility is currently in process.

UTUT Object was started RW, but a utility is in process and only UT access is allowed.

If more than one status occurs, as each status is cleared, the next status in sequence is displayed.

CORRID
Correlation ID of the thread associated with this object as a drain waiter, drain holder, or claim holder.

CONNID
Connection type (Attach mode) of the thread associated with this object.

DRAIN STATUS
HOLD for a drain lock holder, or WAIT for a waiter.

DRAIN MODE
Drain lock mode of S, U, X, IS, IX, or SIX.

DRAIN CLASS
Drain lock class:

CS	Cursor Stability Read
RR	Repeatable Read
WRITE	Write

DRAIN SCOPE
Duration of the drain lock:

DEALLOC	Lock is freed at deallocation.
COMMIT	Lock is freed at commit.
CSRHOLD	Lock is freed when all cursors are closed.
SYSTEM	Lock is freed by the system.
PLNFREE	Lock is freed when the plan is complete.

CLAIM CLASS
Claim class:

CS	Cursor Stability Read
RR	Repeatable Read
WRITE	Write

CLAIM SCOPE
Duration of the drain lock:

DEALLOC	Lock is freed at deallocation.
COMMIT	Lock is freed at commit.
CSRHOLD	Lock is freed when all cursors are closed.

LKOUT—Lockout History

The Lockout History display provides an online history of timeouts (IFCID 196) and deadlocks (IFCID 172).

Note: This display is functionally stabilized; however, it will be removed from the product in future releases. This display is no longer documented in this manual; however, extensive help panels are available online.

The same information is displayed in the windows mode views for lockouts. These views also provide improved analysis capabilities, such as summaries of lock contention by resource or plan. Refer to the lockout views or to the lock contention tuning wizard.

It is recommended that you use these updated windows mode views to analyze timeouts and deadlocks.

See Volume 3 of the *MAINVIEW for DB2 User Guide* for information about these views.

Chapter 13. EDM Pool Display

This chapter describes the analyzer service that provides status and activity information about the EDM pool for a targeted DB2 system.

Note: This service does not support the new counts for DB2 6.1 or later. These new counts are supported in the windows mode views, STEDMP and STEDMPD. See Volume 3 of the *MAINVIEW for DB2 User Guide* for information about these views.

EDMPL—DB2 Environmental Descriptor Manager (EDM) Pool Status

The EDM Pool Status panel displays the status and activity of the Environmental Descriptor Manager pool.

Note: NA is displayed for any fields not available in the installed target DB2 system.

```
BOOLE AND BABBAGE----------    EDM POOL STATUS      -----------PERFORMANCE MGMT
SERV ==> EDMPL           INPUT    11:13:04  INTVL=> 3  LOG=> N  TGT==> DB2D
PARM ==>                                       LINE    1 OF   15 SCROLL=> CSR
EXPAND:  MON(EDM), EDMPL(FREE), EDMPL(DBD)

                                                                % FOUND
                      # PAGES  % PAGES      REQUESTS  LOADS    IN POOL
                      -------  -------      -------- -------   -------
    FREE PAGES          1,999     95.6

    SKCT'S                 22      1.1

    SKPKG'S                22      1.1

    SQL CACHE             102      3.2

    CT'S                   16      0.8           205      23      88.8

    DBD'S                  21      1.0           525      13      97.5

    PKG'S                   0      0.0           544     109      80.0

    TOTAL               2,080                  1,274     145      88.6

*** FAILURES DUE TO POOL FULL ***     0
****************************** END OF DATA *********************************
```

Figure 48. EDM Pool Status Panel

Select Code:

EDMPL

Parameter:

One of the following parameters can be specified for this service. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

FREE Displays the EDMPL Free Storage panel (see "Free Storage" on page 285).

DBD Displays the EDMPL Database Descriptors panel (see "Database Descriptors" on page 286).

Notes:

- The DELTA and RATE parameters for this service affect only the REQUESTS and LOADS and % FOUND IN POOL statistics presentation.
- Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

Displays the status and activity of the Environmental Descriptor Manager (EDM) pool. This display shows when critical thresholds defined for resource usage are exceeded, which may impact users by degrading performance. This information can be used to determine whether installation parameters need to be adjusted to expedite DB2 throughput.

Service Message(s):

When either the DELTA or RATE parameter is used for this service, the following message is displayed in line 3:

```
INTERVAL (MIN) n1/n2
```

where

n1 Is the number of elapsed minutes.

n2 Is the length of the interval.

This indicates the time elapsed within the current statistics interval. If interval times include fractions of a minute, these fractions are truncated on the display.

Expand:

The EDMPL display can be EXPANDed to the following displays:

MON(EDM)
Active Timer Requests display of all active monitors in the Environmental Descriptor Manager pool (EDM) area

EDMPL(FREE)
EDMPL Free Storage display panel

EDMPL(DBD)
EDMPL Database Descriptors display panel

Note: You can access the Free Storage and Database Descriptors displays with either of these methods:

- Tab to the EXPAND button and press ENTER
- Tab to either the FREE PAGE or DBD'S line in the EDMPL display and press ENTER

Area 1 - Free Pages - General EDM Pool Information

This area displays the number and percent of EDM pool pages available.

```
                    # PAGES  % PAGES
                    -------  -------
    FREE PAGES        1,999     95.6
```

where

PAGES
Number of available 4K EDM pool pages.

This includes pages that are never used and pages containing CTs (Cursor Tables) no longer in use.

% PAGES
Number of 4K EDM pool pages available, expressed in percent.

If this value is more than 20 percent during peak periods, the EDM pool is probably too large and can be reduced without performance degradation.

Area 2 - SKCT - Skeleton Cursor Table (Plan) Information

This area shows open Skeleton Cursor Table (SKCT) allocation (plans) by

```
                    # PAGES  % PAGES
                    -------  -------
    SKCT'S               22      1.1
```

where

PAGES
Number of EDM pool pages allocated to SKCTs.

Pages allocated to SKCTs are considered stealable.

% PAGES
Percentage of EDM pool pages allocated to SKCTs.

Area 3 - SKPKG - Skeleton Package Table Information

This area shows the SKPKG counter and its percentage of EDM pool usage.

```
                    # PAGES  % PAGES
                    -------  -------
    SKPKG'S               22      1.1
```

where

PAGES
Number of pages used for the skeleton package table.

Pages allocated to SKPTs are considered stealable.

% PAGES
Percentage of 4K EDM pool pages used for skeleton package tables.

Area 4 - Dynamic SQL Statement Cache Information

This area shows the impact of the dynamic SQL statement cache on the EDM pool.

```
                    # PAGES  % PAGES
                    -------  -------
   SQL CACHE             102      3.2
```

where

PAGES
Number of pages used for the dynamic SQL statement cache.

Note: The *cache dynamic SQL* feature must be enabled (see the CACHE DYNAMIC SQL field in the POOLS section of the ZPARM display).

% PAGES
Percentage of EDM pool pages allocated to the dynamic SQL statement cache.

Area 5 - CT - Cursor Table Section Information

In general, there is at least one Cursor Table section (CT), often more, allocated to an open plan. This area shows the allocation to open CTs by

```
                                                                  % FOUND
                    # PAGES  % PAGES     REQUESTS     LOADS      IN POOL
                    -------  -------     --------   -------      -------
     CT'S                16      0.8          205        23         88.8
```

where

PAGES
Number of EDM pool pages allocated to CTs.

% PAGES
Percentage of EDM pool pages allocated to CTs.

REQUESTS
Number of EDM pool requests caused by a CREATE THREAD. Presentation of this field depends on the service parameter chosen.

LOADS
Number of EDM pool loads from the DB2 directory to satisfy CREATE THREAD requests. Presentation of this field depends on the service parameter chosen.

% FOUND IN POOL
Percentage of requests that were satisfied by existing pages in the EDM pool and did not require I/O to the DB2 directory.

Area 6 - DBD - Database Descriptor Information

This area shows the impact of database descriptors on the EDM pool by

```
                                                                  % FOUND
                     # PAGES  % PAGES     REQUESTS     LOADS      IN POOL
                     -------  -------     --------   -------      -------
     DBD'S                21      1.0          525        13         97.5
```

where

PAGES
Number of EDM pool pages allocated to DBDs.

This reflects both those in use and not. Pages allocated to DBDs not in use are considered stealable.

% PAGES
Percentage of EDM pool pages allocated to DBDs.

REQUESTS
Number of EDM pool requests for DBDs. Presentation of this field depends on the service parameter chosen.

LOADS
Number of EDM pool loads from the DB2 directory for DBDs. Presentation of this field depends on the service parameter chosen.

% FOUND IN POOL
Percentage of requests satisfied by existing DBDs in the EDM pool and did not require I/O to the DB2 Directory.

Area 7 - PKG - Package Table Information

This area shows the set of PKG counters showing request and load activity for package table sections.

```
                                                                  % FOUND
                     # PAGES  % PAGES     REQUESTS     LOADS      IN POOL
                     -------  -------     --------   -------      -------
     PKG'S                 0      0.0          544       109         80.0
```

where

PAGES
Number of 4K EDM pool pages used for package table sections.

% PAGES
Percentage of the EDM pool pages used for package table sections.

REQUESTS
Number of requests for package table sections.

LOADS
Number of load package table sections.

% FOUND IN POOL
Percentage of requests satisfied by existing package table sections in the EDM pool and thus not requiring I/O to the DB2 directory.

Area 8 - Summaries

This area summarizes pages, requests, loads, and the overall ratio of loads to requests and shows the number of DB2 request failures because of a full EDMPL pool as follows:

```
                                                                  % FOUND
                     # PAGES  % PAGES     REQUESTS     LOADS      IN POOL
                     -------  -------     --------   -------      -------
   TOTAL               2,080                 1,274       145         88.6

*** FAILURES DUE TO POOL FULL ***       0
```

where

TOTAL
: Totals of # PAGES, REQUESTS, and LOADS and summary ratio of found in pool.

FAILURES DUE TO POOL FULL
: Number of requests to DB2 that failed because of EDM out-of-space conditions.

This condition is indicated by an SQLCODE of -904, reason code 0C90089. Presentation of this field depends on the service parameter chosen.

Frequent FAILURES DUE TO POOL FULL indicate that the EDM pool is too small. There is no provision for specifying the EDM pool size at installation, because the size is calculated from the DSNTIPD and DSNTIPE panel parameters. However, you can override the actual EDM pool size in the DSNTIPC panel after it is calculated by the CLIST from values on previous panels.

Free Storage

The display shown in Figure 49 can be viewed by tabbing to the FREE PAGES line in the EDMPL display and pressing ENTER or by selecting the FREE expand button.

```
BOOLE AND BABBAGE----------    EDM POOL STATUS      -------------  RX AVAILABLE
SERV ==> EDMPL           INPUT    10:00:03  INTVL=> 3  LOG=> N  TGT==> DB2E
PARM ==> FREE                                  LINE    1 OF   15 SCROLL=> CSR


                   EDM FREE STORAGE

        TOTAL EDM FREE PAGES              = 1,999
        PERCENT OF PAGES FREE IN EDM      = 95.6
        TOTAL EDM FREE ENTRIES            = 10
        LARGEST CONTIGUOUS FREE ENTRIES   = 80,      18,      7,      6,      3
        LARGEST CT/PT: DSN8IC0            = 20480 --CT

******************************** END OF DATA **********************************
```

Figure 49. EDMPL Free Storage Panel

where

TOTAL EDM FREE PAGES
: Number of available 4K EDM pool pages.

  This includes pages that are never used and pages containing CTs (Cursor Tables) no longer in use.

PERCENT OF PAGES FREE IN EDM
: Number of 4K EDM pool pages available, expressed in percent.

  If this value is more than 20 percent during peak periods, the EDM pool is probably too large and can be reduced without performance degradation.

TOTAL EDM FREE ENTRIES
: Total number of free storage entries available in the EDM pool.

LARGEST CONTIGUOUS FREE ENTRIES
: Number of 4K pages in the largest contiguous free storage entries in the EDM pool. Up to five values are displayed.

LARGEST CT/PT
: Largest cursor table or package table name and size in bytes in the EDM pool free storage.

Database Descriptors

The display shown in Figure 50 can be viewed by tabbing to the DBD'S line in the EDMPL display and pressing ENTER or by selecting the DBD expand button.

```
BOOLE AND BABBAGE----------    EDM POOL STATUS      -------------  RX AVAILABLE
SERV ==> EDMPL           INPUT    10:00:03  INTVL=> 3  LOG=> N  TGT==> DB2E
PARM ==> DBD,SORT=DN                           LINE    1 OF   14 SCROLL=> CSR
EXPAND:  LINESEL(DBTS)


                   DATABASE DESCRIPTORS
                  DBD NAME      DBD SIZE
                  --------      --------
                  DSNDB01           8866
                  DSNDB02           1866
                  DSNDB03           2866
                  DSNDB04           4866
                  DSNDDF            4028
                  DWTAZSD           8866
                  DZTEST           28188
                  MWDMRDB1         32294
                  MWRXDDB1         32294
                  NHJTEST          24218
                  NHJ1DB2           8200
                  PRDBTEST         10184
                  PRDB1            12184  (INVALIDATED)
                  TEST12           17142
******************************** END OF DATA ***********************************
```

Figure 50. EDMPL Database Descriptors Panel

where

DBD NAME
: Name of each database descriptor in the EDM pool.

DBD SIZE
: Size of each database descriptor in bytes.

INVALIDATED (for data sharing only)
: If the DBD has been changed by another member of the data sharing group, this field displays INVALIDATED. Existing users of the DBD will be unaffected by the change and will continue to use this copy. The next new user of the DBD will load a valid copy from DASD.

EDMPL DBD Sort

The EDMPL DBD display can be sorted by any column.

To request a sort of the display, enter the following in the PARM field:

`,SORT=value`

where value can be

DN DBD Name - alphabetic sort (default)
DS DBD Size - numeric descending sort

EDMPL DBD Expand

From the EDMPL DBD display, you can expand to the following display:

LINESEL(DBTS)
: A detailed display of information about a specific database (DBTS with a parameter of S database) can be selected from this list by positioning the cursor on the line for that database and pressing ENTER.

Chapter 14. Buffer Pool Displays

This chapter describes the analyzer services that provide status and activity information about the buffer pools and RID pool for a targeted DB2 system.

BFRPL—DB2 Buffer Pool Status

The Buffer Pool Status display shows the status and utilization of DB2 buffer pools.

Note: This service supports the new 8K and 16K buffer pools; however, it does not support the new counts for DB2 6.1 and will be removed from the product in future releases. This service is no longer documented in this manual; however, extensive help panels are available online.

These new counts are supported in the windows mode views for local buffer pools and global buffer pools, which can be accessed from the DB2 Buffer Pool Easy Menu (EZDBFRPL). It is recommended that you use these updated windows mode views to analyze the status and utilization of DB2 buffer pools.

See Volume 3 of the *MAINVIEW for DB2 User Guide* for information about these views.

DBIOx—I/O (Realtime)

The I/O Analysis (Realtime) panels display information about I/O activity and buffer pool cache statistics that is collected by DB2 per data set. There are two types of displays, one showing I/O activity and one showing buffer pool cache statistics. For each, there are four displays from this data, where the only difference is in the degree of granularity:

- DBIOR—I/O ANALYSIS—DB/TS
- DBIOB—I/O ANALYSIS—BPOOL
- DBIOV—I/O ANALYSIS—VOLUME
- DBIOD—I/O ANALYSIS—DATASET

Note: These displays are functionally stabilized; however, they will be removed from the product in future releases. These displays are no longer documented in this manual; however, extensive help panels are available online.

The same information is displayed in the windows mode views for page sets, which can be accessed from the Page Set Easy Menu (EZDPS). These views also provide improved analysis capabilities, such as SSI views of DB2 I/Os to shared volumes (or data sets in a data sharing environment).

It is recommended that you use these updated windows mode views to analyze I/O activity.

See Volume 3 of the *MAINVIEW for DB2 User Guide* for information about these views.

RIDPL—RID Pool Status

The Record ID (RID) Pool Status panel shows the RID pool usage and failure statistics.

```
BOOLE AND BABBAGE----------   RID POOL STATUS     -------------PERFORMANCE MGMT
SERV ==> RIDPL           INPUT    11:44:25  INTVL=> 3  LOG=> N  TGT==> DB2D
PARM ==>                                      ROW 1 OF 10  SCROLL=> CSR
EXPAND:  MON(BUFR), BFRPL

       TOTAL BLOCKS:    420              BLOCKS AVAILABLE:    400

       MAXIMUM USED:     20              BLOCKS IN USE:        20 (5%)

 - - - - - - - - - - - - - - - - FAILURES - - - - - - - - - - - - - - - - - -

       EXCEEDED RDS LIMIT:       0       INSUFFICIENT POOL SIZE:     0
       EXCEEDED DM  LIMIT:       0       TOO MANY CONCURRENT:        0

**************************** END OF DATA ************************************
```

Figure 51. Record ID Pool Status Panel

Select Code:

RIDPL

Parameter:

One of the following parameters can be specified for this service. These parameters apply only to the failure statistics. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA — Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined interval. The default is 30 minutes.

DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE — Displays the values for this statistics interval, calculated at a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Description

The Record ID (RID) Pool Status panel shows the RID pool usage and failure statistics.

Service Messages

When either the DELTA or RATE parameter is used for this service, the following message is displayed in line 3:

`INTERVAL (MIN) n1/n2`

where

n1 — Is the number of elapsed minutes.

n2 — Is the length of the interval.

This indicates the time elapsed within the current statistics interval. If interval times include fractions of a minute, these fractions are truncated on the display.

A message in the parameter field of the panel shows the sequence number of the first row of information displayed and the total number of rows that can be displayed in this scrollable service. For example:

```
ROW 1 OF 10
```

Expand:

The RIDPL display can be expanded to the following displays:

BFRPL
: Buffer Pool Status display

MON(BUFR)
: Active Timer Request display of all active monitors in the DB2 buffer pool (BUFR) area

Area 1 - Pool Status

This area shows pool status.

```
TOTAL BLOCKS:    420              BLOCKS AVAILABLE:    400

MAXIMUM USED:     20              BLOCKS IN USE:        20 (5%)
```

where

TOTAL BLOCKS
: Total number of 16K blocks allocated to the RID pool.

  This value is extracted from the DSNZPARM definition.

BLOCKS AVAILABLE
: Number of 16K blocks available for the RID lists.

MAXIMUM USED
: Maximum number of 16K blocks used for the RID lists.

BLOCKS IN USE
: Current number of 16K blocks used for the RID lists.

Area 2 - Failures

This area shows the reasons for the RID list processing failures.

```
 - - - - - - - - - - - - - - - - FAILURES - - - - - - - - - - - - - - - - - -

       EXCEEDED RDS LIMIT:       0       INSUFFICIENT POOL SIZE:     0
       EXCEEDED DM  LIMIT:       0       TOO MANY CONCURRENT:        0

**************************** END OF DATA ************************************
```

where

EXCEEDED RDS LIMIT
: Number of times the number of RIDs for a request exceeded the RDS (Relational Data System) limit.

INSUFFICIENT POOL SIZE
: Number of times the pool size was insufficient to meet the concurrent number of RID lists.

EXCEEDED DM LIMIT
: Number of times the number of RIDs for a request exceeded the DM (Data Manager) limit.

TOO MANY CONCURRENT
: Number of times that DB2 determined that there were too many concurrent requests.

Chapter 15. Log Display

This chapter describes the analyzer service that provides status and activity information about the logs for a targeted DB2 system.

DLOGS—DB2 Log Status

The DB2 Log Status panel shows log status, configuration, and activity.

```
BOOLE & BABBAGE------------     DB2 LOG STATUS      -----------PERFORMANCE MGMT
SERV ==> DLOGS            INPUT   20:30:02  INTVL=> 3  LOG=> N  TGT==> DB2A
PARM ==>                                      ROW     1  OF   20  SCROLL=> CSR
EXPAND:  MON(LOG)
 - - - - - - - - - - - - - - LOG DATA SET CONFIGURATION - - - - - - - - - - - -
TYPE     CURRENT MODE   DEVICE  VOLUME   UNIT   DEFINED  AVAILABLE      % USED
ACTIVE-1  DS03   SNGL   3350    IMF010   472         3          2           7%

ARCHIVE-1 A00045 SNGL   SYSDA   BLKSIZE:  8,192    CI'S ARCHIVED:         600


- - - - - BSDS DATA SET CONFIGURATION  - - - - - -  - - - - - CHECKPOINTS - - -
TYPE      MODE   DEVICE  VOLUME   UNIT   ACCESSES           FREQUENCY    5,000
BSDS-1    DUAL   3350    IMF010   472         184           NEXT CKPT:   4,335
BSDS-2    DUAL   3350    IMF010   472                       RBA:  0000048F8AFC

- - - - - - - - - - - - - - - - - - BUFFERS - - - - - - - - - - - - - - - - - - -
BUFFER SIZE(K)      400    CI'S CREATED          922  WRITE REQ-FORCE      144
# BUFFERS           100    WRITES             12,786  WRITE REQ-NOWAIT  12,642
WRITE THRESHOLD      20    THRESHOLD %-BFRS       20  WRITE REQ-WAIT         0
INPUT BUFFER(K)      28    WAITS UNAVAIL.BFRS      0  %
FORCE REQS          1%

- - - - - - - - - - - - - - - RETRIEVAL EFFICIENCY - - - - - - - - - - - - - - -
CURRENT/MAX ALLOC     0/ 3      FROM ARCHIVE      0       FROM ACTIVE      203
DELAYED FOR ALLOC        0      READ ALLOCS       0       FROM BUFFERS       0
DELAYED FOR VOLUME       0      LOOK-AHEAD        0
                                LK-AHD FAIL       0
```

Figure 52. DB2 Log Status Panel

Select Code:

DLOGS

Parameter:

One of the following parameters can be specified for this service. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Note: Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

This display shows log status, configuration and activity. It is scrollable.

Service Message(s):

When either the DELTA or RATE parameter is used for this service, the following message is displayed in line 3:

```
INTERVAL (MIN) n1/n2
```

where

n1 Is the number of elapsed minutes.

n2 Is the length of the interval.

This indicates the time elapsed within the current statistics interval. If interval times include fractions of a minute, these fractions are truncated on the display.

A message in the parameter field of the panel shows the sequence number of the first row of information displayed and the total number of rows that can be displayed in this scrollable service.

For example:

```
ROW 1 OF 20
```

Expand:

The DLOGS display can be EXPANDed to the following display:

MON(LOG) Active Timer Requests display of all active monitors in the DB2 log (LOG) area

Area 1 - Log Data Set Configuration Section

The log data set configuration matrix contains the following information about active and archive log data sets:

```
 - - - - - - - - - - - - - - LOG DATA SET CONFIGURATION - - - - - - - - - - - -
TYPE     CURRENT MODE   DEVICE  VOLUME   UNIT   DEFINED  AVAILABLE      % USED
ACTIVE-1  DS03   SNGL   3350    IMF010   472         3          2           7%

ARCHIVE-1 A00045 SNGL   SYSDA   BLKSIZE:  8,192    CI'S ARCHIVED:         600
```

where

TYPE
Type of log data set, as follows:

Active - Both primary and secondary, if active.
Archive - Both primary and secondary, if active.

CURRENT
Lowest level data set name qualifier for the individual log type.

As DB2 increments these names, the displayed data set name suffix indicates the current generation of these data sets.

MODE
Either SNGL (single) or DUAL depending on which mode was defined at installation.

If the mode is DUAL and an error occurred, the log affected shows an ERROR status.

DEVICE
Physical device type where the data set resides.

This can be a DASD model identifier or TAPE for the archive logs.

VOLUME
Physical volume where the data set resides.

This information is not shown for the archive log.

UNIT
Physical unit where the data set resides.

This information is not shown for the archive log.

DEFINED
Number of log data sets defined to this DB2 system.

This information is not shown for the archive log.

AVAILABLE
Number of log data sets currently available to this DB2 system.

This information is not shown for the archive log.

% USED
Amount of space used within the current log data set, expressed as a percentage.

This information is not shown for the archive log.

BLKSIZE
Archive log block size, as defined at DB2 installation.

The default is 8198, the range is 8192 to 28672 in 4K increments.

CI'S ARCHIVED
Total number of active log records archived to date.

Area 2 - BSDS Data Set Configuration Section

This area shows the data set configuration matrix, which contains the following information about the BSDS log data set(s):

```
- - - - - BSDS DATA SET CONFIGURATION  - - - - - -
TYPE      MODE   DEVICE  VOLUME   UNIT   ACCESSES
BSDS-1    DUAL   3350    IMF010   472         184
BSDS-2    DUAL   3350    IMF010   472
```

where

TYPE
: Type of BSDS data set.

  Both primary and secondary are shown, if active.

MODE
: Either SINGLE or DUAL depending on which mode was defined at installation.

  If the mode is DUAL and an error occurred, the data set affected shows an ERROR status.

DEVICE
: Physical device type where the data set resides.

VOLUME
: Physical volume where the data set resides.

UNIT
: Physical unit where the data set resides.

ACCESSES
: Number of times the Log Manager accessed the BSDS. Presentation of this field depends on the service parameter chosen.

Area 3 - Checkpoint Information

This area displays information on checkpoints as follows:

```
- - - - - CHECKPOINTS - - -
        FREQUENCY:   5,000
        NEXT CKPT:   4,335
        RBA:  0000048F8AFC
```

where

FREQUENCY:
Number of log records written between DB2 checkpoints.

This is the checkpoint frequency (200 to 500,000 range) as defined at DB2 installation. The default is 1000.

NEXT CHKPT:
Number of log records to be written before the next checkpoint is taken.

RBA:
Relative byte address of the last checkpoint.

Area 4 - Buffers Section

This area of the panel shows the active log capacities and activity as

```
- - - - - - - - - - - - - - - - - - BUFFERS - - - - - - - - - - - - - - - - - - - - -
BUFFER SIZE(K)      400    CI'S CREATED          922  WRITE REQ-FORCE      144
# BUFFERS           100    WRITES             12,786  WRITE REQ-NOWAIT  12,642
WRITE THRESHOLD      20    THRESHOLD %-BFRS       20  WRITE REQ-WAIT         0
INPUT BUFFER(K)      28    WAITS UNAVAIL.BFRS      0  %
FORCE REQS          1%
```

where

BUFFER SIZE(K)
: Total log output buffer size (in kilobytes) as defined at DB2 installation.

  This value, which is a multiple of 4, can be between 40 and 4000. The default is 400.

BUFFERS
: Number of log buffers, which is the buffer size divided by 4.

  Each buffer is identical in size to a log control interval (CI) of 4K.

WRITE THRESHOLD
: Number of log buffers to be filled before a write occurs, as specified at DB2 installation.

  This number can be from 1 to 256. The default is 20.

INPUT BUFFER(K)
: Log input buffer size (in kilobytes) as defined at DB2 installation.

  This value, which is a multiple of 4, can be between 28 and 60. The default is 28.

CI'S CREATED
: Total number of CIs created by write requests. Presentation of this field depends on the service parameter chosen.

WRITES
: Total number of write requests to the active log. Presentation of this field depends on the service parameter chosen.

  If dual logging is in effect, the number shown is the number of calls for the primary log. The same number occurs for the secondary log.

THRESHOLD %-BFRS
: Number of log buffers to be filled before a write occurs, expressed as a percentage of the total buffers.

WAITS:UNAVAIL.BFRS
: Number of times logging activity had to wait because of unavailable buffers. Presentation of this field depends on the service parameter chosen.

  Increase the log buffer size or count if this number is significant.

WRT REQ-FORCE
: Count of FORCE log-write requests. Presentation of this field depends on the service parameter chosen.

WRT REQ-NOWAIT
: Count of NOWAIT log-write requests. Presentation of this field depends on the service parameter chosen.

WRT REQ-WAIT
: Count of WAIT log-write requests. Presentation of this field depends on the service parameter chosen.

% FORCE REQS
: Percentage of the total log write requests that were forced.

  DB2 performance is degraded if this number is too high.

Area 5 - Log Retrieval Efficiency

This area displays the following information about log retrieval efficiency:

```
- - - - - - - - - - - - - - - RETRIEVAL EFFICIENCY - - - - - - - - - - - - - -
CURRENT/MAX ALLOC     0/ 3      FROM ARCHIVE      0       FROM ACTIVE      203
DELAYED FOR ALLOC        0      READ ALLOCS       0       FROM BUFFERS       0
DELAYED FOR VOLUME       0      LOOK-AHEAD        0
                                LK-AHD FAIL       0
```

where

CURRENT/MAX ALLOC
: Both the current and maximum allocations of input archive log data sets.

If the MAX ALLOC value is reached, another backout requiring the archive log causes the DELAYED FOR ALLOC to be incremented.

DELAYED FOR ALLOC
: Number of times backout processing was delayed because of unavailable resources. This is usually because not enough tape units have been made available for archive read (MAX ALLOC above). It can also be that the log read service task is not available.

DELAYED FOR VOLUME
: Number of times backout processing was delayed because of tape volume contention, where only one reader per tape is possible.

FROM ARCHIVE
: Number of times backout was performed from the archive log data set(s), rather than the active log.

A count of more than zero indicates that the active log is probably too small. Presentation of this field depends on the service parameter chosen.

READ ALLOCS
: Number of archive log read allocations. Presentation of this field depends on the service parameter chosen.

This value increments during backout operations performed from the archive log data set(s). This is the least desirable and most expensive form of DB2 backout processing.

If this number seems high, consider increasing the number of active log data sets or the frequency of COMMIT processing for higher volume applications.

LOOK-AHEAD
: Number of look-ahead tape mounts attempted.

LK-AHD-FAIL
: Number of failed look-ahead tape mounts.

FROM ACTIVE
: Number of times successful backouts were possible from the active log data set(s). Presentation of this field depends on the service parameter chosen.

Although this is not as expensive as FROM ARCHIVE, I/O is required and this form of backout is not as desirable as FROM BUFFERS.

FROM BUFFERS

Number of times successful backouts were possible from the log buffers. Presentation of this field depends on the service parameter chosen.

This is the most desirable form of backout because no I/O is involved.

Chapter 16. DDF Displays

This chapter describes the analyzer services that provide distributed processing statistics for a targeted DB2 system.

- DDFSM provides summary statistics about data flow between remote locations.
- DDFDT displays additional statistics for a specific location.
- DDFVT and DDFCV display VTAM-related information.

DDFSM—DDF Statistics Summary

The DDF Statistics Summary panel displays a row of statistics for each remote location for which the target DB2 has statistics.

```
BOOLE AND BABBAGE---------- DDF STATISTICS SUMMARY  -------------  RX AVAILABLE
SERV ==> DDFSM            INPUT   07:00:22  INTVL=> 5  LOG=> N  TGT==> DB2F
PARM ==>                                    ROW      1 OF      1 SCROLL=> CSR
EXPAND:  DDFVT, USERS, DDFCV, LINESEL(DDFDT)
LOCATION:   DB2F                      DDF ADDRESS SPACE CPU:     0.0%
LUNAME:     LUDB2F                    DATABASE ACCESS THREADS:     0/10
DDF STATUS: STARTED                   DIST ALLIED THREADS:         1
DBAT Q:        0                      CONVERSATIONS DEALLOC:       0

THREADS  CURRENT INACTIVE:      0     CONNECTIONS COLD STARTS:         0
         MAXIMUM INACTIVE:      0                 WARM STARTS:         0
                                                  RESYNC ATTEMPTS:     0
                                                  RESYNC SUCCESSES:    0

                              TRANSACTION  CONVERSATION    BYTES     CONV
REMOTE LOCATION   LUNAME       TO   FROM    TO  FROM    SENT  REC    Q'D
----------------  --------   ----- -----  ----- -----  ----- -----  ----
DB1F              LUDB1F         2     0      2     0   2690  3316     0
****************************** END OF DATA ******************************
```

Figure 53. DDF Statistics Summary Panel

Select Code:

DDFSM

Parameter:

One of the following parameters can be specified for this service. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Note: Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

Displays a row of statistics for each remote location for which the target DB2 has statistics.

Expand:

The DDFSM display can be EXPANDed to the following displays:

DDFVT
: DDF VTAM Status display

USERS
: User Summary display with the DDF parameter

DDFCV
: DDF Conversations display

LINESEL(DDFDT)
: Detailed display of information about a specific remote location (DDFDT) can be selected from this location list by positioning the cursor on the line for that location and pressing ENTER

Area 1 - Local Location Statistics

This area displays information about the local site of the target DB2 subsystem.

```
LOCATION:   DB2F                        DDF ADDRESS SPACE CPU:     0.0%
LUNAME:     LUDB2F                      DATABASE ACCESS THREADS:     0/10
DDF STATUS: STARTED                     DIST ALLIED THREADS:         1
DBAT Q:        0                        CONVERSATIONS DEALLOC:       0

THREADS  CURRENT INACTIVE:      0       CONNECTIONS COLD STARTS:         0
         MAXIMUM INACTIVE:      0                   WARM STARTS:         0
                                                    RESYNC ATTEMPTS:     0
                                                    RESYNC SUCCESSES:    0
```

where

LOCATION:
: Location name of the local site of the target DB2 subsystem.

LUNAME:
: VTAM logical unit name of the local location.

DDF STATUS:
: Status of DDF:

STARTED	DDF has been started.
NOT STARTED	DDF has not been started.
NOT INSTALLED	DDF option has not been specified for this DB2.

DBAT Q:
: Number of Database Access Threads queued for execution.

THREADS CURRENT INACTIVE:
: Current number of inactive Database Access Threads.

MAXIMUM INACTIVE:
: Maximum number of inactive threads that existed.

DDF ADDRESS SPACE CPU:
CPU utilization of the DIST address space as a percentage of total CPU usage.

DATABASE ACCESS THREADS:
n n/m, where n is the current number of active database access threads and m is the maximum allowable as specified in ZPARM.

DIST ALLIED THREADS:
Number of active threads participating in distributed processing (excluding database access threads).

CONVERSATIONS DEALLOC:
Number of conversations deallocated because the ZPARM limit was reached for maximum concurrent remote threads (active + inactive).

CONNECTIONS COLD STARTS:
Number of cold start connections with all remote locations (two-phase commit operations only).

WARM STARTS:
Number of warm start connections with all remote locations (two-phase commit operations only).

RESYNC ATTEMPTS:
Number of resynchronization connections attempted with all remote locations (two-phase commit operations only).

RESYNC SUCCESSES:
Number of resynchronization connections that succeeded with all remote locations (two-phase commit operations only).

Area 2 - Remote Location Statistics

This area displays information about each remote site.

```
                                TRANSACTION  CONVERSATION    BYTES     CONV
REMOTE LOCATION   LUNAME          TO   FROM    TO  FROM    SENT  REC    Q'D
----------------  --------      ----- -----  ----- -----  ----- -----  ----
DB1F              LUDB1F          2     0      2     0   2690  3316     0
****************************** END OF DATA ******************************
```

where

REMOTE LOCATION
Name of the remote location.

Note: The statistics for all DRDA locations are grouped together with a location name of 'DRDA REMOTE LOCS'.

LUNAME
VTAM logical unit name of the remote location.

TRANSACTION
Number of DB2 transactions migrated to and from this location.

CONVERSATION
Number of conversations initiated to and from the remote location. A conversation is a specific instance of an LU 6.2 session between a remote and a local location.

BYTES
Number of bytes sent and received.

CONV QUEUED
Number of conversations queued because the limit had been reached. This limit is determined by the VTAM definitions for both logical units and the specifications in the Communications Data Base (CDB). If this number is high, you may want to increase the session limit, but be aware that doing so will increase the network load.

DDFDT—DDF Statistics Detail

This service displays statistics about a specific remote location.

```
BOOLE AND BABBAGE---------- DDF STATISTICS DETAIL   -------------  RX AVAILABLE
SERV ==> DDFDT            INPUT   07:03:43  INTVL=> 5  LOG=> N  TGT==> DB2F
PARM ==> DB1F                               ROW     1  OF    19  SCROLL=> CSR
EXPAND:  DDFVT, DDFCV

                       LUNAME    LOCATION           CONV Q   DBAT Q
                       --------  ----------------   ------   ------
              REMOTE.. LUDB1F    DB1F                  N/A      N/A
              LOCAL... LUDB2F    DB2F                    0        0

                        FROM       TO                          FROM       TO
                       REMOTE    REMOTE                       REMOTE    REMOTE
SQL STATEMENTS......        0         4    2PH PREPARE.....        0         0
ROWS................        0         0    2PH LAST AGENT..        0         0
BYTES...............    3,316     2,690    2PH COMMITS.....        0         0
MESSAGES............        2         4    2PH BACKOUTS....        0         0
TRANSACTIONS........        0         2    2PH FORGET RSP..        0         0
CONVERSATIONS.......        0         2    2PH REQ COMMIT..        0         0
COMMITS.............        0         0    2PH BACKOUT RSP.        0         0
ABORTS..............        0         0
BLOCK FETCH ROWS....        0         0
BLOCK FETCH BLOCKS..        0         0
******************************** END OF DATA ***********************************
```

Figure 54. DDF Statistics Detail Panel

Select Code:

DDFDT

Parameter:

Required parameter:

location name — Specifies the name of the remote site. If this service is selected from the DDFSM service, this value is primed.

Optional parameters:

One of the following parameters can be specified for this service. It must be separated from the location name with a comma. If neither of these parameters is entered, the current values accumulated since DB2 subsystem startup are displayed.

,DELTA — Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

,RATE — Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Note: Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

Displays statistics for the specified remote location.

Expand:

The DDFDT display can be EXPANDed to the following displays:

DDFVT
: DDF VTAM Status display

DDFCV
: DDF Conversations display

Area 1 - General Statistics

This area displays information about the local site of the target DB2 subsystem and the specified remote site.

```
                        LUNAME    LOCATION           CONV Q   DBAT Q
                        --------  ----------------   ------   ------
              REMOTE.. LUDB1F    DB1F                   N/A      N/A
              LOCAL... LUDB2F    DB2F                     0        0
```

where

NETWORK
: VTAM network names for the remote and local locations.

LUNAME
: VTAM logical unit names for the remote and local locations.

LOCATION
: Location names for the remote and local locations. The local location is the site of the target DB2 subsystem.

CONV QUEUED
: Number of conversations queued because the limit had been reached. This limit is determined by the VTAM definitions for both logical units and the specifications in the Communications Data Base (CDB). If this number is high, you may want to increase the session limit, but be aware that doing so will increase the network load. This value is not applicable to the remote location.

DBAT Q
: Number of Database Access Threads queued for execution.

Area 2 - Remote Location Statistics

This area displays information about the specified remote site.

```
                        FROM       TO                          FROM       TO
                       REMOTE    REMOTE                       REMOTE    REMOTE
SQL STATEMENTS......        0         4    2PH PREPARE.....        0         0
ROWS................        0         0    2PH LAST AGENT..        0         0
BYTES...............    3,316     2,690    2PH COMMITS.....        0         0
MESSAGES............        2         4    2PH BACKOUTS....        0         0
TRANSACTIONS........        0         2    2PH FORGET RSP..        0         0
CONVERSATIONS.......        0         2    2PH REQ COMMIT..        0         0
COMMITS.............        0         0    2PH BACKOUT RSP.        0         0
ABORTS..............        0         0
BLOCK FETCH ROWS....        0         0
BLOCK FETCH BLOCKS..        0         0
******************************** END OF DATA ***********************************
```

where

SQL STATEMENTS
: Number of SQL statements sent and received.

ROWS
: Number of rows sent to the remote location, including the SQLDA. The received column is the number of rows of data received from the remote location, excluding the SQLCA and SQLDA (if sent).

BYTES
: Number of bytes sent and received.

MESSAGES
: Number of VTAM messages sent and received.

TRANSACTIONS
: Number of DB2 transactions migrated to and from this location.

CONVERSATIONS
: Number of conversations initiated to and from the remote location. A conversation is a specific instance of using an LU 6.2 session between a remote and a local location.

SQL COMMITS
: Number of commit requests sent and received.

SQL ABORTS
: Number of abort requests sent and received.

BLOCK FETCH ROWS
: Number of rows transmitted using block fetch. The same value is displayed in the send and receive columns.

BLOCK FETCH BLOCKS
: Number of blocks transmitted using block fetch.

These statistics are provided for two-phase commit operations:

2PH PREPARE
: Number of prepare requests sent to the participant and received from the coordinator for two-phase commit operations.

2PH LAST AGENT
: Number of last agent requests sent to the coordinator and received from the initiator for two-phase commit operations.

2PH COMMITS
: Number of commit requests sent to the participant and received from the coordinator for two-phase commit operations.

2PH BACKOUTS
: Number of backout requests sent to the participant and received from the coordinator for two-phase commit operations.

2PH FORGET RSP
: Number of forget responses sent to the coordinator and received from the participant for two-phase commit operations.

2PH REQ COMMIT
: Number of request commit responses sent to the coordinator and received from the participant for two-phase commit operations.

2PH BACKOUT RSP
: Number of backout responses sent to the coordinator and received from the participant for two-phase commit operations.

DDFVT—DDF VTAM Status

The DDF VTAM Status panel displays a row of VTAM data for each logmode for an LU.

```
BOOLE AND BABBAGE----------    DDF VTAM STATUS      -----------PERFORMANCE MGMT
SERV ==> DDFVT            INPUT   18:08:47  INTVL=> 3  LOG=> N  TGT==> DB2D
PARM ==>                                    ROW     1 OF     1   SCROLL=> CSR
EXPAND:  DDFSM, LINESEL(DDFCV)
LOCATION:      SEATTLE                      VTAM LEVEL:          0340
LOCAL NETWORK: USBOOL01                     CONVERSATIONS:         10
LU NAME:       SEDB2A

                   SYSTEM                     CONV  CNOS       DISTR DBASE  CONV
LUNAME   LOGMODE  LOGMODE  REMOTE LOCATION    LIM  SESS CONVS THRDS THRDS   Q'D
-------- -------- -------- ---------------- ----- ----- ----- ----- ----- -----
NYDB2A   IBMDB2LM IBMDB2LM NEW_YORK            10    10     2     0     1     0
NYDB2A   DB2LMNY  IBMDB2LM NEW_YORK            10    10     2     0     1     0
CHDB2A   DB2LMCH  IBMDB2LM CHICAGO             10    10     2     0     1     0
NODB2A   IBMDB2LM IBMDB2LM NEW_ORLEANS         10    10     2     0     1     0
NODB2A   DB2LMNO  IBMDB2LM NEW_ORLEANS         10    10     2     0     1     0
******************************** END OF DATA ********************************
```

Figure 55. DDF VTAM Status Panel

Select Code:

DDFVT

Parameter:

One of the following parameters can be specified for this service. If no parameter is entered, the current values from DB2 subsystem startup are displayed.

DELTA Displays the current values for this statistics interval. The statistics interval is a cumulative count within a predefined time interval (the default is 30 minutes). DELTA is the difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request.

RATE Displays the values for this statistics interval, calculated in a per minute rate. The rate is DELTA divided by the number of elapsed minutes.

Note: Statistics intervals are MVDB2, not DB2, statistics intervals. The interval time is predefined in minutes with the DB2STATS parameter in the BBIISP00 member of the BBPARM data set.

Description:

Displays rows of VTAM data for each remote location and logmode combination for which the target DB2 has statistics.

Expand:

The DDFVT display can be EXPANDed to the following displays:

DDFSM
: DDF Statistics Summary display.

LINESEL(DDFCV)
: Detailed display of information about DDF conversations for a remote location (DDFCV) can be selected from this location list by positioning the cursor on the line for that location and pressing ENTER.

Area 1 - Local Location Statistics

This area displays information about the local site of the target DB2 subsystem.

```
LOCATION:      SEATTLE              VTAM LEVEL:              330
LOCAL NETWORK: USBOOL01             CONVERSATIONS:            10
LU NAME:       SEDB2A
```

where

LOCATION:
Name of the local location of the target DB2 subsystem.

LOCAL NETWORK:
Name of the VTAM network of the local location.

LUNAME:
VTAM logical unit name of the local location.

VTAM LEVEL:
VTAM release of the local location.

CONVERSATIONS:
Current number of allocated conversations.

Note: This value does not include system conversations.

Area 2 - Remote Location Statistics

This area displays information about each logmode for an LU.

```
                    SYSTEM                      CONV  CNOS       DISTR DBASE  CONV
LUNAME   LOGMODE  LOGMODE  REMOTE LOCATION    LIM  SESS CONVS THRDS THRDS   Q'D
-------- -------- -------- ---------------- ----- ----- ----- ----- ----- -----
NYDB2A   IBMDB2LM IBMDB2LM NEW_YORK            10    10     2     0     1     0
NYDB2A   DB2LMNY  IBMDB2LM NEW_YORK            10    10     2     0     1     0
CHDB2A   DB2LMCH  IBMDB2LM CHICAGO             10    10     2     0     1     0
NODB2A   IBMDB2LM IBMDB2LM NEW_ORLEANS         10    10     2     0     1     0
NODB2A   DB2LMNO  IBMDB2LM NEW_ORLEANS         10    10     2     0     1     0
******************************** END OF DATA ********************************
```

where

LUNAME
: VTAM logical unit name of the remote location.

LOGMODE
: VTAM logon mode name.

SYSTEM LOGMODE
: Name of the logmode entry to be used for system conversations for this LU. This is also the default logmode used when the CDB does not indicate specific logmode selection for distributed threads.

REMOTE LOCATION
: Name of the remote location.

CONV LIM
: Maximum conversations specified in the SYSIBM.SYSLUMODES table for the logmode for this LU.

CNOS SESS
: Negotiated session limit for this remote location.

CONVS
: Current number of active conversations for the logmode for this LU.

Note: This value does not include system conversations.

DISTR THRDS
: Number of distributed threads active for this remote location.

DBASE THRDS
: Number of database access threads active for this remote location.

CONV Q'D
: Number of conversations currently queued because the session limit for the logmode for this LU has been reached.

DDFCV—DDF Conversations

The DDF Conversations panel displays a row of information for each active conversation.

```
BOOLE AND BABBAGE----------   DDF CONVERSATIONS     -----------PERFORMANCE MGMT
SERV ==> DDFCV            INPUT   18:09:09  INTVL=> 3  LOG=> N  TGT==> DB2D
PARM ==>                                    ROW     1 OF     4   SCROLL=> CSR
EXPAND:  DDFVT, USERS
LOCATION: SEATTLE

LUNAME   LOGMODE  SESSION ID        LAST REQ   STATE   PLAN NAME AUTHID   TYPE
-------- -------- ---------------- ---------- -------- --------- -------- -----
NYDB2A   DB2LMNY  009F01ADF20A0E38 17:49:11.8 RECEIVE  RXDB2     CIR7     DBAT
NYDB2A   DB2LMNY  009F01ADF20A0E37 17:49:10.2 RECEIVE  RXDB2     CIR7     DBAT
NYDB2A   IBMDB2LM F09F01ADF20A0E35            SEND                        SYS-S
NYDB2A   IBMDB2LM 009F01ADF20A0E36            SEND                        SYS-P
******************************** END OF DATA ********************************
```

Figure 56. DDF Conversations Panel

Select Code:

DDFCV

Parameter:

The following parameter can be specified for this service:

luname
: Specifies that only conversations for a specific LUNAME are displayed. This value is primed if the service is entered from a line select option in the DDFVT service.

Description:

Displays a row of statistics for each active conversation.

Expand:

The DDFCV display can be EXPANDed to the following displays:

DDFVT
: DDF VTAM Status display.

USERS
: User Summary display with the DDF parameter.

Area 1 - VTAM Conversations

This area displays information about each active conversation.

```
LOCATION: SEATTLE

LUNAME   LOGMODE  SESSION ID        LAST REQ   STATE   PLAN NAME AUTHID   TYPE
-------- -------- ---------------- ---------- -------- --------- -------- -----
NYDB2A   DB2LMNY  009F01ADF20A0E38 17:49:11.8 RECEIVE  RXDB2     CIR7     DBAT
NYDB2A   DB2LMNY  009F01ADF20A0E37 17:49:10.2 RECEIVE  RXDB2     CIR7     DBAT
NYDB2A   IBMDB2LM F09F01ADF20A0E35            SEND                        SYS-S
NYDB2A   IBMDB2LM 009F01ADF20A0E36            SEND                        SYS-P
******************************** END OF DATA ********************************
```

where

LOCATION:
Name of the local location of the target DB2 subsystem.

LUNAME
VTAM logical unit name of the remote location.

LOGMODE
VTAM logon mode entry name for this session.

SESSION ID
VTAM session instance ID as 16 hex digits.

Note: If the conversation is queued, this value is all zeroes.

LAST REQ
Time the last request was sent or received.

Note: This value is not available for system conversations.

STATE
State of the conversation:

SEND	Conversation is in VTAM SEND mode.
RECEIVE	Conversation is in VTAM RECEIVE mode.
ALLOCATE	Conversation is being allocated.
DEALLOC	Conversation is being deallocated.

PLAN NAME
Plan name of the thread using this session.

Note: This value is not available for system conversations.

AUTHID
AUTHID of the user using this session.

Note: This value is not available for system conversations.

TYPE
Type of session:

DIST	A distributed thread is using this session.
DBAT	A database access thread is using this session.
SYS-S	Secondary system conversation.
SYS-P	Primary system conversation.

Part 4. Monitors (Early Warnings/Recent History)

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Chapter 17. Introduction

Each DB2 monitor service is a timer-driven monitor that measures a key DB2 system resource variable over time and writes warning messages whenever user-defined thresholds are exceeded as requested by the user. The measurement obtained at each sampling interval is compared to a user-defined threshold for that variable. The threshold comparison detects conditions for which user-defined warning messages can be issued. The measurements are stored online so that a plot of the recent history of any monitored variable can be viewed at any time. Optional service parameters narrow the scope of a single request and let several requests for the same monitor service be active concurrently for some of the monitors (see "Resource or Workload Monitors" on page 60).

Each of these DB2 monitor services is described in this section by

- Service select code needed to request the service.
- Valid parameters that can be used with the request.
- Value measured.
- Type of data collected.

Note: As described in "Data Measurements" on page 62, a plot of collected COUNT data type also shows the calculated rates-per-second (AVG/SEC) for each sampling interval. A plot of collected AVERAGE data type also shows the event counts (EVENTS) per interval.

- The default service title that is used in the displays and for the warning message, which can be overridden with the TITLE keyword of the SET request (see "Monitor Request Title" on page 63).
- The warning message that can be issued by that service.

  Note: Additional monitors function as background exception samplers. These background samplers send messages to the DB2EX analyzer display when exception thresholds are exceeded. See "Background Exception Sampler" on page 341.

Alphabetical List of Monitor Services

Table 19 lists the DB2 monitor display services alphabetically.

Table 19. Alphabetical List of DB2 Monitor Services

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#GSWC	GBP CLEAN PAGES WRITTEN	455
#GSWR	GBP CHANGED PAGES WRITTEN	455
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#MAXL	MAXIMUM LOCKS HELD	460
#PFIO	PREFETCH I/O	453
#PFPG	PREFETCH PAGES READ	453
#PFRD	PREFETCH READS	452
#PFRQ	PREFETCH REQUESTS	453
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#SPRC	STORED PROCEDURES EXECUTED	449
#SQLA	ADMINISTRATIVE SQL STATEMENTS	448
#SQLC	SQL STATEMENTS PER COMMIT	448
#SQLD	DDL STATEMENTS	447
#SQLM	DATA MANIPULATIVE SQL STATEMENTS	447
#SUSP	SUSPENSIONS	460
#TMO	TIMEOUTS	459
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@ELDR	AVERAGE ELAPSED FOR DRAIN WAITS	467
@ELGL	AVERAGE ELAPSED WAIT—GLOBAL LOCK	469
@ELGM	AVERAGE ELAPSED WAIT—NOTIFY MESSAGE	469
@ELP3	AVERAGE ELAPSED WAIT—ALL CLASS 3	466
@ELPD	AVERAGE ELAPSED IN DB2	465
@ELPL	AVERAGE ELAPSED FOR PAGE LATCH	468
@ELPR	AVERAGE ELAPSED FOR PREFETCH READS	467
@ELIO	AVERAGE ELAPSED FOR I/O	466
@ELLK	AVERAGE ELAPSED FOR LOCKS	466
@ELSP	AVERAGE ELAPSED WAIT—SPROC TCB	468
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ARCTC	TAPE VOLUME CONTENTION READ DELAYS	435
ARCTM	LOOK-AHEAD TAPE MOUNTS	435
ARCWA	ARCHIVE LOG WRITE ALLOCATIONS	431

Table 19. Alphabetical List of DB2 Monitor Services (Continued)

Service	Title	page
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BINDS	SUCCESSFUL AUTOMATIC BINDS	380
BNPKF	FAILED AUTOMATIC BINDS FOR PACKAGES	382
BNPKS	SUCCESSFUL AUTOMATIC BINDS FOR PACKAGES	381
BPUSE	BUFFER POOL PERCENT IN USE	402
BPUTL	BUFFER POOL PERCENT UTILIZATION	401
BSDSA	BSDS ACCESS REQUESTS	434
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DB2DP	DEMAND PAGING	437
DBATQ	DBATS QUEUED-MAXDBAT	445
DBTQD	DATABASE THREAD QUEUED	377
DDFBR	DDF BYTES RECEIVED	439
DDFBS	DDF BYTES SENT	439
DDFCQ	DDF CONVERSATIONS QUEUED	440
DDFT1	CONNECT TERM-MAX TYPE1	444
DESRD	NUMBER OF PAGES FOR WHICH DESTRUCTIVE READ REQUESTED	410
DRN	DRAIN REQUESTS	395
DRNF	DRAIN FAILURES	395
DROWA	DIRECT ROW ACCESS	386

Table 19. Alphabetical List of DB2 Monitor Services (Continued)

Service	Title	page
DSOPN	DATABASE DATA SETS OPEN	373
DSOPR	DATABASE DATA SET OPEN REQUESTS	373
DSUTL	OPEN DATABASE DATA SET UTILIZATION	374
DWTX	VERTICAL DEFERRED WRITE THRESHOLD REACHED	410
ECSAP	EXTENDED CSA PERCENTAGE OF UTILIZATION	438
EDMDS	EDM DATA SPACE % UTIL	400
EDMLD	AVERAGE EDM REQUESTS PER LOAD I/O	399
EDMUT	EDM POOL % UTILIZATION	399
EOMFL	END OF MEMORY FAILURES	379
EOTFL	END OF TASK FAILURES	380
G2WRF	GBP CF WRITE FAIL 2NDRY	429
GCAST	GBP CASTOUT REQUESTS	426
GCTPG	GBP CASTOUT PAGES	426
GETPG	GETPAGE REQUESTS	403
GETRI	GETPAGE (GET) REQUESTS PER READ I/O (RIO)	406
GFAIL	GBP FAILURES	428
GNEG	NEGOTIATE P-LOCK	397
GNOEN	NO ENGINES—P-LOCK	398
GNTFM	NOTIFY MESSAGES	398
GOTHR	GBP OTHER REQUESTS	428
GPGWR	GBP PAGES WRITTEN	425
GPLK	GLOBAL P-LOCK REQUESTS	395
GRDIN	GBP READ REQUESTS—INTEREST	427
GRDNO	GBP READ REQUESTS—NO INTEREST	427
GRDRQ	GBP READ REQUESTS WITH DATA	425
GSUSP	GLOBAL LOCK SUSPENSIONS	397
GXES	GLOBAL LOCK XES REQUESTS	396
HPRDF	READ PAGES FAILURES	422
HPVPA	SUCCESSFUL ASYNCHRONOUS READS FOR HP-TO-VP	420
HPVPS	SUCCESSFUL SYNCHRONOUS READS FOR HP-TO-VP	420
HPWRF	WRITE PAGE FAILURES	421

Table 19. Alphabetical List of DB2 Monitor Services (Continued)

Service	Title	page
ILREQ	IRLM REQUEST COUNTS	394
IXLOK	INDEX SPACE LOCKS	390
LDEAD	LOCK DEADLOCK FAILURES	391
LESCL	LOCK ESCALATIONS	392
LOBMX	MAX LOB STORAGE	386
LOGRD	LOG READS FOR BACKOUT/RECOVERY	433
LOGUT	ACTIVE LOG PERCENT UTILIZATION	433
LOGWR	LOG WRITE REQUESTS	432
LOGWT	LOG BUFFER WAITS	432
LREQ	LOCK REQUESTS	393
LSTPF	NUMBER OF LIST PREFETCH REQUESTS	409
LSUSP	SUSPENSIONS	393
LTIME	LOCK TIMEOUT FAILURES	392
MAXPF	MAXIMUM CONCURRENT PARALLEL I/O PREFETCH STREAMS	421
MIAPF	MULTI-INDEX FAILURES	409
MIGDS	MIGRATED DATA SETS	407
MXLOK	MAXIMUM PAGE LOCK HELD BY USER	391
NACTC	CURRENT INACTIVE DB THREADS	441
NESTM	MAX NESTED SQL LEVEL	387
PFDIO	DYNAMIC PREFETCH READ I/O	416
PFDPG	DYNAMIC PREFETCH PAGES READ	416
PFDRQ	DYNAMIC PREFETCH REQUESTS	415
PFIOF	PREFETCH I/O FAILURES	417
PFLIO	LIST PREFETCH READ I/O	414
PFLPG	LIST PREFETCH PAGES READ	415
PFSIO	SEQUENTIAL PREFETCH READ I/O	413
PFSPG	SEQUENTIAL PREFETCH PAGES READ	413
PFSRQ	SEQUENTIAL PREFETCH REQUESTS	412
PFTIO	TOTAL PREFETCH READ I/O	411
PFTPG	TOTAL PREFETCH PAGES READ	412

Table 19. Alphabetical List of DB2 Monitor Services (Continued)

Service	Title	page
PFTRQ	TOTAL PREFETCH REQUESTS	411
PGLOK	PAGE LOCKS	391
PIO	PREFETCH READ I/O	408
PKBND	NUMBER OF PACKAGES BOUND	381
PLBND	NUMBER OF PLANS BOUND	381
PRLF	I/O PARALLEL GROUPS WITH FALLBACK TO SEQUENTIAL	384
PRLG	I/O PARALLEL GROUPS EXECUTED	384
PRLGF	CONDITIONAL GETPAGE FAILURE	418
PRLQ	PARALLEL QUERY REQUESTS	417
PRLQF	PARALLEL QUERY REQUEST FAILURES	418
PRLSF	SYSPLEX PARALLEL QUERY FAILURES	385
PRL12	PREFETCH REDUCED TO 1/2	419
PRL14	PREFETCH REDUCED TO 1/4	419
PWS	SYSTEM PAGES WRITTEN	405
PWSWI	SYSTEM PAGES WRITTEN (PWS) PER WRITE I/O (WIO)	407
P2CON	2-PHASE CONNECTIONS	441
P2RMC	REMOTE LOCATION COORDINATOR COMMITS	443
P2RMI	REMOTE LOCATION COORDINATOR INDOUBTS	443
P2RMR	REMOTE LOCATION COORDINATOR ROLLBACKS	444
P2RMT	REMOTE LOCATION COORDINATOR TOTAL OPERATIONS	442
P2RSY	2-PHASE RESYNC CONNECTIONS	442
RIDUT	RID POOL PERCENT UTILIZATION	409
RIO	READ I/O ACTIVITY	404
RSQLR	REMOTE SQL STATEMENTS RECEIVED	383
RSQLS	REMOTE SQL STATEMENTS SENT	383
RTO	RECALL TIME-OUTS	408
RWP	READS WITH PAGING	402
SEQIO	SEQUENTIAL READ I/O REQUESTS	423
SEQPG	SEQUENTIAL GETPAGE REQUESTS	422
SPROC	STORED PROCEDURES	385

Table 19. Alphabetical List of DB2 Monitor Services (Continued)

Service	Title	page
SQLAC	SQL ACTIVITY	382
SWS	SYSTEM PAGE UPDATES	404
SWSPW	SYSTEM PAGE UPDATES (SWS) PER SYSTEM PAGES WRITTEN (PWS)	406
THDAB	ABORTED THREADS	378
THDAC	ACTIVE THREAD STATUS	376
THDCR	CREATE THREAD REQUESTS	377
THDID	IN DOUBT THREAD STATUS	377
THDQD	QUEUED THREAD STATUS	376
THDUT	THREAD PERCENT UTILIZATION	375
THDWT	CREATE THREAD WAITED	378
TRIGR	TRIGGER USAGE	387
TSLOK	TABLE SPACE LOCKS	390
UDF	UDF USAGE	388
USLOK	USERS SUSPENDED FOR LOCKS	389
WIO	WRITE I/O ACTIVITY	405
WKMAX	MAX WORKFILES USED CONCURRENTLY	424
WKNBF	WORKFILE NOT CREATED - NO BUFFERS	424
WKPFZ	WORKFILE PREFETCH QUANTITY IS ZERO	423
WWP	WRITES WITH PAGING	403

Resource Monitor Services by Area

Table 20 lists the DB2 resource monitor services grouped by area.

Table 20. DB2 Resource Monitor Services by Area

Service	Title	Page	Area
DSOPN	DB DATA SETS OPEN	373	General DB2 System
DSOPR	DB DATA SET OPEN REQUESTS	373	
DSUTL	OPEN DB DATA SET % UTIL	374	
CONUT	CONNECTION % UTILIZATION	375	User Activity
THDUT	THREAD % UTILIZATION	375	
THDAC	ACTIVE THREADS	376	
THDQD	QUEUED THREADS	376	
DBTQD	DATABASE THREAD QUEUED	377	
THDID	IN DOUBT THREADS	377	
THDCR	CREATE THREAD REQUESTS	377	
THDWT	CREATE THREAD WAITED	378	
THDAB	ABORTED THREADS	378	
COMP2	PHASE 2 COMMITS	378	
COMSY	SYNC COMMITS	379	
COMRO	READ-ONLY COMMITS	379	
EOMFL	EOM FAILURES	379	
EOTFL	EOT FAILURES	380	
BINDS	SUCCESSFUL AUTO BINDS	380	
BINDF	FAILED AUTO BINDS	380	
PLBND	PLANS BOUND	381	
PKBND	PACKAGES BOUND	381	
BNPKS	AUTO BIND PKG SUCCESSFUL	381	
BNPKF	AUTO BIND PKG FAILED	382	
SQLAC	SQL ACTIVITY	382	
RSQLS	REMOTE SQL SENT	383	
RSQLR	REMOTE SQL RECEIVED	383	
PRLG	I/O PARALLEL GROUPS EXECUTED	384	
PRLF	I/O PARALLEL GROUPS WITH FALLBACK TO SEQUENTIAL	384	
PRLSF	SYSPLEX PARALLEL QUERY FAILURES	385	
SPROC	STORED PROCEDURES	385	

Table 20. DB2 Resource Monitor Services by Area (Continued)

Service	Title	Page	Area
USLOK	USERS SUSPENDED FOR LOCK	389	Locks
TSLOK	TABLE SPACE LOCK COUNT	390	
IXLOK	INDEX SPACE LOCK COUNT	390	
PGLOK	PAGE LOCK COUNT	391	
MXLOK	MAX PAGE LOCKS	391	
LDEAD	LOCK DEADLOCK FAILURES	391	
LTIME	LOCK TIMEOUT FAILURES	392	
LESCL	LOCK ESCALATIONS	392	
LSUSP	SUSPENSIONS	393	
LREQ	LOCK REQUESTS	393	
ILREQ	IRLM REQUEST COUNTS	394	
CLM	CLAIM REQUESTS	394	
CLMF	CLAIM FAILURES	394	
DRN	DRAIN REQUESTS	395	
DRNF	DRAIN FAILURES	395	
GPLK	GLOBAL P-LOCK REQUESTS	395	
GXES	GLOBAL LOCK XES REQUESTS	396	
GSUSP	GLOBAL LOCK SUSPENSIONS	397	
GNEG	NEGOTIATE P-LOCK	397	
GNOEN	NO ENGINES - P-LOCK	398	
GNTFM	NOTIFY MESSAGES	398	
EDMUT	EDM % UTILIZATION	399	EDM Pool
EDMLD	AVG EDM REQUESTS/LOAD	399	

Table 20. DB2 Resource Monitor Services by Area (Continued)

Service	Title	Page	Area
BPUTL	BFR POOL % UTILIZATION	401	Buffer Pools
BPUSE	BFR POOL % IN USE	402	
RWP	READS WITH PAGING	402	
WWP	WRITES WITH PAGING	403	
GETPG	GETPAGE REQUESTS	403	
RIO	READ I/O	404	
SWS	SYSTEM PAGE UPDATES	404	
WIO	WRITE I/O	405	
PWS	SYSTEM PAGES WRITTEN	405	
GETRI	GETPAGES PER READ I/O	406	
SWSPW	UPDATES PER PAGE WRITTEN	406	
PWSWI	PAGES WRITTEN/ WRITE I/O	407	
MIGDS	MIGRATED DATA SETS	407	
RTO	RECALL TIME-OUTS	408	
PIO	PREFETCH READ I/O	408	
RIDUT	RID POOL % UTILIZATION	409	
MIAPF	MULTI-INDEX FAILURES	409	
LSTPF	LIST PREFETCH REQ	409	
DESRD	DESTRUCTIVE READ	410	
DWTX	VERTICAL DEFERRED WRITE THRESHOLD REACHED	410	
PFTRQ	TOTAL PREFETCH REQUESTS	411	
PFTIO	TOTAL PREFETCH READ I/O	411	
PFTPG	TOTAL PREFETCH PAGES READ	412	
PFSRQ	SEQUENTIAL PREFETCH REQUESTS	412	
PFSIO	SEQUENTIAL PREFETCH READ I/O	413	
PFSPG	SEQUENTIAL PREFETCH PAGES READ	413	
PFLRQ	LIST PREFETCH REQUESTS	414	
PFLIO	LIST PREFETCH READ I/O	414	
PFLPG	LIST PREFETCH PAGES READ	415	
PFDRQ	DYNAMIC PREFETCH REQUESTS	415	
PFDIO	DYNAMIC PREFETCH READ I/O	416	
PFDPG	DYNAMIC PREFETCH PAGES READ	416	
PFIOF	PREFETCH I/O FAILURES	417	
PRLQ	PARALLEL QUERY REQUESTS	417	
PRLQF	PARALLEL QUERY REQUEST FAILURES	418	
PRLGF	CONDITIONAL GETPAGE FAILURES	418	
PRL12	PREFETCH REDUCED TO 1/2	419	
PRL14	PREFETCH REDUCED TO 1/4	419	
HPVPS	SUCCESSFUL SYNCHRONOUS READS FOR HP-TO-VP	420	
HPVPA	SUCCESSFUL ASYNCHRONOUS READS FOR HP-TO-VP	420	
MAXPF	MAXIMUM CONCURRENT PARALLEL I/O PREFETCH STREAMS	421	
HPWRF	WRITE PAGE FAILURES	421	
HPRDF	READ PAGE FAILURES	422	

Table 20. DB2 Resource Monitor Services by Area (Continued)

Service	Title	Page	Area
SEQPG	SEQUENTIAL GETPAGE REQUESTS	422	Buffer Pools (continued)
SEQIO	SEQUENTIAL READ I/O REQUESTS	423	
WKPFZ	WORKFILE PREFETCH QUANTITY IS ZERO	423	
WKNBF	WORKFILE NOT CREATED - NO BUFFERS	424	
WKMAX	MAX WORKFILES USED CONCURRENTLY	424	
GRDRQ	GBP READ REQUESTS WITH DATA	425	
GPGWR	GBP PAGES WRITTEN	425	
GCAST	GBP CASTOUT REQUESTS	426	
GCTPG	GBP CASTOUT PAGES	426	
GRDIN	GBP READ REQUESTS - INTEREST	427	
GRDNO	GBP READ REQUESTS - NO INTEREST	427	
GFAIL	GBP FAILURES	428	
GOTHR	GBP OTHER REQUESTS	428	
ARCWA	ARCHIVE LOG WRITE ALLOCS	431	Logs
ARCRA	ARCHIVE LOG READ ALLOCS	431	
ARCWR	ARCHIVE LOG CI WRITES	432	
LOGWT	LOG BUFFER WAITS	432	
LOGWR	LOG WRITE REQUESTS	432	
LOGUT	ACTIVE LOG % UTILIZATION	433	
LOGRD	LOG READS FOR BACKOUT	433	
BSDSA	BSDS ACCESSES	434	
CHKPT	NUMBER OF CHECKPOINTS	434	
ARCTC	TAPE VOLUME CONTENTION READ DELAYS	435	
ARCDL	READ ACCESSES DELAYED	435	
ARCTM	LOOK-AHEAD TAPE MOUNTS	435	
DB2DP	DB2 DEMAND PAGING	437	MVS Services
CSAPG	CSA PAGING	438	
CSAP	CSA % UTILIZATION	438	
ECSAP	ECSA % UTILIZATION	438	
DDFBS	DDF BYTES SENT	439	DDF
DDFBR	DDF BYTES RECEIVED	439	
DDFCQ	DDF CONVERSATIONS QUEUED	440	
CNVLM	CONVERSATIONS DEALLOCATED - ZPARM LIMIT	440	
NACTC	CURRENT INACTIVE DB THREADS	441	
P2CON	2-PHASE CONNECTIONS	441	
P2RSY	2-PHASE RESYNC CONNECTIONS	442	
P2RMT	REMOTE LOCATION COORDINATOR TOTAL OPERATIONS	442	
P2RMI	REMOTE LOCATION COORDINATOR INDOUBTS	443	
P2RMC	REMOTE LOCATION COORDINATOR COMMITS	443	
P2RMR	REMOTE LOCATION COORDINATOR ROLLBACKS	444	

Workload Monitor Services by Area

A service with a # prefix means that monitor collects a count; an @ prefix means that monitor collects averages. Optional service parameters narrow the scope of a single request and let several requests for the same monitor service be active concurrently (see "The SET Timer Request" on page 75). Selection criteria also can be specified to analyze specific workloads.

The workload and resource monitor requests are activated and controlled by the same timer and SET facility. Workload monitor data is collected the same as the workload trace data, through the Instrumentation Facility Interface (IFI) facility.

Table 21 lists the DB2 workload monitor services grouped by area.

Table 21. DB2 Workload Monitor Services by Area

Service	Title	Page	Area
#SQLD	DDL SQL STATMENTS	447	SQL Monitors
#SQLM	DATA MANIPULATIVE STMTS	447	
#SQLA	ADMINISTRATIVE STMTS	448	
#SQLC	SQL STMTS PER COMMIT	448	
#DYN	DYNAMIC SQL STATEMENTS	449	
#CALL	SQL CALL STATEMENTS	449	
#SPRC	STORED PROCEDURES EXECUTED	449	
#REOP	REOPTIMIZATIONS	450	
#GETP	GETPAGE REQUESTS	451	Buffer Usage Monitors
#UPDP	UPDATE PAGE REQUESTS	451	
#RDIO	READ I/Os	452	
#PFRD	PREFETCH READS	452	
#WRIT	WRITE IMMEDIATES	452	
#PFRQ	PREFETCH REQUESTS	453	
#PFIO	PREFETCH I/O	453	
#PFPG	PREFETCH PAGES READ	453	
#GETF	CONDITIONAL GETPAGE FAILURES	454	
#HPVS	SYNCHRONOUS HIPERPOOL READS	454	
#HPPG	ASYNCHRONOUS HIPERPOOL PAGES READ	454	
#GSRD	GBP SYNCHRONOUS READS	455	
#GSWR	GBP CHANGED PAGES WRITTEN	455	
#GSWC	GBP CLEAN PAGES WRITTEN	455	
@CPU	AVERAGE CPU USED	457	CPU Usage Monitors
@CPUD	AVG CPU IN DB2	457	
#DDLK	DEADLOCKS	459	Lock Usage Monitors
#TMO	TIMEOUTS	459	
#SUSP	SUSPENSIONS	460	
#ESCL	ESCALATIONS	460	
#MAXL	MAX LOCKS HELD	460	
#CLMF	CLAIM FAILURES	461	
#DRNF	DRAIN FAILURES	461	
#GSUS	GLOBAL CONTENTION SUSPENSIONS	461	
#GFAL	FALSE CONTENTION SUSPENSIONS	462	
#GRTA	INCOMPATIBLE RETAINED LOCK SUSPENSIONS	462	
#GLRQ	GLOBAL P-LOCK LOCK REQUESTS	462	
#GLKX	GLOBAL LOCK XES REQUESTS	463	
#GNTS	NOTIFY MESSAGES SENT	463	

Table 21. DB2 Workload Monitor Services by Area (Continued)

Service	Title	Page	Area
@ELAP	AVG ELAPSED TIME	465	Elapsed Time Monitors
@ELPD	AVG ELAPSED IN DB2	465	
@ELP3	AVG ELAPSED WAIT - ALL CLASS 3	466	
@ELIO	AVG ELAPSED FOR I/O	466	
@ELLK	AVG ELAPSED FOR LOCKS	466	
@ELPR	AVG ELAPSED FOR PREFETCH READS	467	
@ELDR	AVG ELAPSED FOR DRAIN WAITS	467	
@ELCL	AVG ELAPSED FOR CLAIM WAITS	468	
@ELPL	AVG ELAPSED FOR PAGE LATCH	468	
@ELSP	AVG ELAPSED WAIT - SPROC TCB	468	
@ELGM	AVG ELAPSED WAIT - NOTIFY MESSAGE	469	
@ELGL	AVG ELAPSED WAIT - GLOBAL LOCK	469	
#PROC	DB2 TRANS PROCESSED	471	Transaction Workload Monitor
#PRLG	PARALLEL I/O GROUPS EXECUTED	473	Parallelism Monitors
#PRLR	PARALLEL I/O GROUPS EXECUTED REDUCED DEGREE	473	
#PRLF	PARALLEL I/O GROUPS FALLBACK TO SEQUENTIAL	474	
#PRLS	SYSPLEX PARALLEL QUERY FAILURES	474	

Background Exception Sampler

Background sampling is used to detect exception conditions in critical DB2 system resources (such as the logs or buffer pools) and also to detect thread exceptions during execution (runaway queries) that could be serious enough to impact DB2 performance.

Exception Handling

An exception sampler automatically scans the system on a fixed interval to detect whether one or more of the exception conditions listed in this section exists. If so, it is compared to the conditions found during the previous scan and updated when necessary. If an exception is new, it is time-stamped and added to the list displayed with the DB2EX service. The same message, with the target DB2 subsystem name appended in front, is written to the Journal log. If an AutoOPERATOR product is installed in the same BBI-SS PAS, the message can invoke an automation EXEC. The purpose of the message number is to allow AutoOPERATOR, if installed, to detect this message, to possibly undertake some corrective action, and add or remove an AutoOPERATOR exception condition to the AO system.

If the exception previously existed, no action is taken.

When a condition that previously existed is no longer detected, it is removed from the DB2EX display list, and a condition-cleared message is sent to the Journal log. The text begins with EXCEPTION CLEARED: followed by the original message text. For example, when a DZ1090S FINAL ACTIVE LOG DATASET 75% FULL condition no longer exists, a DZ1091I message is issued as

```
DZ1091I  EXCEPTION CLEARED: FINAL ACTIVE LOG DATASET 75% FULL
```

List of Exceptions

This is a list of predefined exceptional conditions that cause entries to be placed on the exceptions screen. These show the severity level of the exception as

I	Information Only
W	Warning
S	Severe
M	Resource or Workload Monitor-detected exceptions

To change the parameter definitions for these exceptions, see “Customizing Background Processing” in the *MAINVIEW for DB2 Customization Guide*.

Note: Messages with buffer pool identifiers, shown as BP(n), can show the following values:

- 0—49 for 4K pools
- K—K9 for 32K pools

Information Only Exceptions

- `DZ0010I - (n) DB(s)/TS(s) STOPPED`

  There are (n) number of databases and objects in the databases that are stopped.

  Note: Not currently available for DB2 4.1 and 5.1.

- `DZ0020I - USER (user) LOCK ESCALATED`

  The NUMLKTS installation parameter was exceeded by this user, which caused lock escalation.

- `DZ0030I - LOG ARCHIVE JOB WAITING`

  The job that archives the active log is waiting to execute.

- `DZ0040I - BP(n) DEFERRED WRITE REACHED`

  The deferred write threshold (50 percent of buffer utilization) was reached, causing asynchronous write activity to be started.

Warning Exceptions

- `DZ0510W - LAST ACTIVE LOG OPENED FOR OUTPUT`

  The last available active log data set was opened for output. Archiving may have been delayed.

- `DZ0520W - BP(n) PREFETCH DISABLED`

  The sequential prefetch threshold (90% of buffer utilization) was reached, disabling sequential prefetch activity.

- `DZ0530W - (n) DB(s)/TS(s) RESTRICTED`

  There are (n) number of databases and objects in the databases that have restricted usage defined in DB2.

  Note: Not currently available for DB2 4.1 and 5.1.

- `DZ0540W - ARCHIVE LOG READS OCCURRING`

  Read activity is taking place from the archive log for a backout or recovery. Consider increasing the active log size.

- `DZ0550W - MAX TSO USERS CONNECTED`

  All available, defined TSO connections are in use.

- `DZ0560W - MAX BATCH USERS CONNECTED`

  All available, defined batch connections are in use.

- `DZ0570W - MAX DATASETS OPEN`

  The maximum number of data sets is now open.

- `DZ0590W - SOS - SHORT ON STORAGE`

  DB2 is short on storage.

- `DZ0610W - dddd RUNAWAY IMS MPP`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PST=nnnn TRAN=tttttttt TYPE=tttt CRGN=cccccccc
  USER xxxxxxxx
  ```

  IMS MPP user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0620W - dddd RUNAWAY CICS TRANSACTION  USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj TRAN=tttttttt TASK=nnnn
  ```

  CICS user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0630W - dddd RUNAWAY TSO QUERY USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  PGM=pppppppp PLAN=llllllll
  ```

  TSO user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. pppppppp is the name of the program and llllllll is the DB2 plan this user is executing. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0640W - dddd RUNAWAY BATCH  USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PGM=pppppppp PLAN=llllllll
  ```

  Batch user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. pppppppp is the name of the program and llllllll is the DB2 plan this user is executing. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0650W - dddd RUNAWAY CAF, USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PGM=pppppppp PLAN=llllllll
  ```

  CAF user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. pppppppp is the name of the program and llllllll is the DB2 plan this user is executing. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0660W - dddd RUNAWAY UTILITY FUNCTION USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PGM=pppppppp PLAN=llllllll
  ```

  Utility user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. pppppppp is the name of the program and llllllll is the DB2 plan this user is executing. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0670W - dddd RUNAWAY DBAT USER xxxxxxxx`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj
  ```

  Database access thread user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0680W - dddd RUNAWAY IMS BMP`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PST=nnnn TRAN=tttttttt TYPE=tttt CRGN=cccccccc
  USER xxxxxxxx
  ```

  IMS BMP user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

- `DZ0690W - dddd RUNAWAY IMS TBMP`

  ```
  CPU% =nnn|GETPAGES=ggggg|GP-RATE=rrrrr|CPUTOT=ccccc|
  ELAPSED=eeeee|UPDCOM=nnnnnn
  J=jjjjjjjj PST=nnnn TRAN=tttttttt TYPE=tttt CRGN=cccccccc
  USER xxxxxxxx
  ```

  IMS transaction BMP (TBMP) user xxxxxxxx is using resources that exceed defined thresholds for DB2 subsystem dddd. Message shows specific resource exceeding the threshold (CPU, GETPAGE requests, or update requests without issuing a COMMIT).

Severe Exceptions

- `DZ1010S - INDOUBT THREADS`

  Indoubt threads exist.

- `DZ1020S - IMS TASK(S) QUEUED FOR THREAD(S)`

  IMS transactions are waiting for threads.

- `DZ1030S - CICS TASK(S) QUEUED FOR THREAD(S)`

  CICS transactions are waiting for threads.

- `DZ1040S - EDM POOL FULL FAILURES`

  The EDM pool limit was reached, causing allocation failures.

- `DZ1050S - BP(n) DM CRITICAL THRESHOLD REACHED`

  The Data Manager critical threshold (95 percent buffer utilization) was reached for buffer pool BP(n). When this occurs, DB2 considers all active buffer pools to be at this threshold and issues GETPAGE and RELEASEs at the row level instead of page level.

- `DZ1060S - BP(n) IMMEDIATE WRITE THRESHOLD REACHED`

  The immediate write threshold (97.5 percent buffer utilization) was reached for buffer pool BP(n). When this occurs, any update causes an immediate write.

- `DZ1080S - BP(n) EXPANSION FAILURE, VIRTUAL STORAGE SHORTAGE`

  An ALTER was requested and the buffer pool (BPn) could not expand because of a shortage of virtual storage.

- `DZ1090S - FINAL ACTIVE LOG DATASET 75% FULL`

  The last available active log is nearly full and archiving will be required soon.

- `DZ1100S - ACTIVE LOG REDUCED TO SINGLE MODE`

  A log data set error made one of the dual logs unusable (if dual logging was in effect). DB2 switched to single mode.

- `DZ1110S - BSDS REDUCED TO SINGLE MODE`

  A BSDS error made one of the dual BSDSs unusable (if dual BSDSs were in use). DB2 switched to single mode.

Resource and Workload Monitor Messages

These messages are listed with the following service descriptions in Part 4, “Monitors (Early Warnings/Recent History)”.

Chapter 18. Active Timer Requests (Option 3)

The Active Timer Requests list can be accessed by selecting Option 3 from the Primary Option Menu or by using the D line command from the Data Collection Monitors list application.

Option 3 from the Primary Option Menu displays all the active timer requests (workload or resource monitor service requests, application trace service requests, and Image log requests for analyzer or monitor summary service displays) that you are authorized to view.

Using the D line command displays the active timer requests for the selected service only.

With this application you can

- View or modify active monitors
- View plot or graphic monitor summary displays
- Print a screen image of a monitor plot or graphic summary display to the online BBI-SS PAS Image log automatically or to the TS Image log or your BBISPRNT data set

```
BOOLE AND BABBAGE  --------- ACTIVE TIMER REQUESTS ----------  PERFORMANCE MGMT
COMMAND ===>                                                   TGT ===> DB2A
                                  INPUT    INTVL ==> 3      TIME --  10:52:10
COMMANDS: SM (START MONITORS), SORT, AREA, X ON|OFF, DM (DMON), DW (DWARN)
LC CMDS: S (SELECT), W (SHOW),      M(MODIFY),
         P (PURGE),  R (REPLICATE), H (HELP), Z (STOP)                     >>>
LC   SERV  PARM     TITLE                   CURRENT  WVAL |-8-6-4-2-0+2+4+6+8+|
     SOSCN          SOS CONTRACTIONS              0    NZ |         W         |
     DSOPN          DB DATA SETS OPEN            38    60 |>>>>>    W         |
     DSOPR          DB DATASET OPEN REQUESTS      0     3 |         W         |
     DSOPR BP0      DB DATASET OPEN REQUESTS      0     3 |         W         |
     DSOPR BP1      DB DATASET OPEN REQUESTS      0    NZ |         W         |
     DSOPR BP2      DB DATASET OPEN REQUESTS      0    NZ |         W         |
     DSUTL          OPEN DB DATASET % UTIL        3    20 |*        W         |
     CONUT TSO      CONNECTION % UTILIZATION     10    40 |<<       W         |
     CONUT BATCH    CONNECTION % UTILIZATION     10    60 |*        W         |
     THDUT          THREAD % UTILIZATION          0    30 |         W         |
     THDAC IMS      ACTIVE THREADS                0    NZ |         W         |
     THDAC BATCH    ACTIVE THREADS                0    NZ |         W         |
     THDAC CAF      ACTIVE THREADS                0     5 |         W         |
     THDQD          QUEUED THREADS                1    NZ |*********W*********|
     THDID          IN DOUBT THREADS              0    NZ |         W         |
     EDMLD          AVG EDM REQUESTS/LOAD         0   140 |         W         |
     EDMLD CT       AVG EDM REQUESTS/LOAD         0   140 |         W         |
     EDMLD DBD      AVG EDM REQUESTS/LOAD         0   140 |         W         |
     BPUTL          BFR POOL % UTILIZATION        6    30 |*        W         |
     BPUSE          BFR POOL % IN USE             0    30 |         W         |
     RWP            READS WITH PAGING             0    NZ |         W         |
     WWP            WRITES WITH PAGING            0    NZ |         W         |
     GETPG          GETPAGE REQUESTS            144    20 |*********W*********|
     GETPG BP0      GETPAGE REQUESTS            144    20 |*********W*********|
     GETPG BP1      GETPAGE REQUESTS              0    20 |         W         |
     GETPG BP2      GETPAGE REQUESTS              0    20 |         W         |
     GETRI          GETPAGES PER READ I/O        10   <30 |*********W******   |
```

Figure 57. Active Timer Requests Application (Before Scrolling Right)

```
 BOOLE AND BABBAGE  --------- ACTIVE TIMER REQUESTS ----------  PERFORMANCE MGMT
 COMMAND ===>                                                   TGT ===> DB2A
                                    INPUT    INTVL ==> 3      TIME --  10:52:10
 COMMANDS: SM (START MONITORS), SORT, AREA, X ON|OFF, DM (DMON), DW (DWARN)
 LC CMDS: S (SELECT), W (SHOW),      M(MODIFY),
          P (PURGE),  R (REPLICATE), H (HELP), Z (STOP)                    <<<
LC   SERV  PARM     TITLE                       USER ID  TARGET  SEC AREA  STAT
     SOSCN          SOS CONTRACTIONS            CIR7     DB2A     A  DSYS  ACTV
     DSOPN          DB DATA SETS OPEN           CIR7     DB2A     A  DSYS  ACTV
     DSOPR          DB DATASET OPEN REQUESTS    CIR7     DB2A     A  DSYS  ACTV
     DSOPR BP0      DB DATASET OPEN REQUESTS    CIR7     DB2A     A  DSYS  ACTV
     DSOPR BP1      DB DATASET OPEN REQUESTS    CIR7     DB2A     A  DSYS  ACTV
     DSOPR BP2      DB DATASET OPEN REQUESTS    CIR7     DB2A     A  DSYS  ACTV
     DSUTL          OPEN DB DATASET % UTIL      CIR7     DB2A     A  DSYS  ACTV
     CONUT TSO      CONNECTION % UTILIZATION    CIR7     DB2A     A  USER  ACTV
     CONUT BATCH    CONNECTION % UTILIZATION    CIR7     DB2A     A  USER  ACTV
     THDUT          THREAD % UTILIZATION        CIR7     DB2A     A  USER  ACTV
     THDAC IMS      ACTIVE THREADS              CIR7     DB2A     A  USER  ACTV
     THDAC BATCH    ACTIVE THREADS              CIR7     DB2A     A  USER  ACTV
     THDAC CAF      ACTIVE THREADS              CIR7     DB2A     A  USER  ACTV
     THDQD          QUEUED THREADS              CIR7     DB2A     A  USER  ACTV
     THDID          IN DOUBT THREADS            CIR7     DB2A     A  USER  ACTV
     EDMLD          AVG EDM REQUESTS/LOAD       CIR7     DB2A     A  EDM   ACTV
     EDMLD CT       AVG EDM REQUESTS/LOAD       CIR7     DB2A     A  EDM   ACTV
     EDMLD DBD      AVG EDM REQUESTS/LOAD       CIR7     DB2A     A  EDM   ACTV
     BPUTL          BFR POOL % UTILIZATION      CIR7     DB2A     A  BUFR  ACTV
     BPUSE          BFR POOL % IN USE           CIR7     DB2A     A  BUFR  ACTV
     RWP            READS WITH PAGING           CIR7     DB2A     A  BUFR  ACTV
     WWP            WRITES WITH PAGING          CIR7     DB2A     A  BUFR  ACTV
     GETPG          GETPAGE REQUESTS            CIR7     DB2A     A  BUFR  ACTV
     GETPG BP0      GETPAGE REQUESTS            CIR7     DB2A     A  BUFR  ACTV
     GETPG BP1      GETPAGE REQUESTS            CIR7     DB2A     A  BUFR  ACTV
     GETPG BP2      GETPAGE REQUESTS            CIR7     DB2A     A  BUFR  ACTV
     GETRI          GETPAGES PER READ I/O       CIR7     DB2A     A  BUFR  ACTV
```

Figure 58. Active Timer Requests Application (After Scrolling Right)

A select line command for an active monitor request provides direct access to a plot display of data collected by the selected monitor. Other line commands can be used to view current timer request options, access data entry panels to replicate or change the current options to make another unique SET timer request for that service, or confirm a purge of the selected request.

Timer requests are shown in the Active Timer Requests list as they are processed. This list can be scrolled left and right as well as up and down (see the *Using MAINVIEW* manual). It allows service selection by line command and shows all the active requests, parameters specified for each requested service, the latest measured value, the specified warning threshold, a plot for the current sampling, the user logon identification, the target DB2 of the request, the service security classification, the area of DB2 being monitored, and the service status by

Field Name	Description
LC	A line command input field. One-character line commands can be entered in this field to view, modify, or replicate the options for a selected request; purge a request; or display HELP information about the service (see "Line Commands" on page 353).
SERV	A scrollable list of services for all active timer requests by service select code. The Active Timer Requests list application can also be displayed by using the D line command from the Data Collection Monitors list, as described in "Line Commands" on page 361. Only those requests that are active for that service are shown.
PARM	This field shows the parameters that were defined for the active requests (see Chapter 4, "Alphabetical Reference of Services" on page 37 for a list of the services and applicable parameters).
TITLE	The service title.

Note: The next three fields are blank for application trace and Image log requests:

CURRENT	The latest measured value. **Note:** If the request is not active, its status (as defined in the STAT field) is displayed in this column.
WVAL	The warning threshold.
-8-6-4-2-0+2+4+6+8+0	A plot for the current sampling and a warning threshold (W marker) if the WVAL keyword was specified with the SET request. Plot characters indicate a trend as follows: < Shows a downward trend from the preceding sampled values. > Shows an upward trend from the preceding sampled values. * Shows no change from the preceding sampled values. If you have a color monitor, the graph is displayed in the following colors: Red Warning status Turquoise Normal values for the current interval Yellow Maximum Threshold: Values for the current period are greater than the values for the previous period Minimum Threshold: Values for the current period are less than the values for the previous period
USER ID	The logon identification of the user who made the request.
TARGET	The DB2 subsystem defined as the target of the requested service either by default or user-specified.
SEC	The security code for user access to the service.

AREA The DB2 resource area being analyzed. This field could contain

Field Data	Description
DSYS	General DB2 system
USER	User activity
LOCK	Resource or user locks
EDM	Environmental Descriptor Manager pool
BUFR	DB2 buffer pools
LOG	DB2 logs
DMVS	MVS services
DDF	Distributed Data Facility
WKLD	DB2 workload
DDF	Distributed Data Facility

STAT The service request status which could be

Field Data	Description
ACTV	The request is active.
COMP	The request executed and completed normally.
HELD	The request is being held and is pending release.
INIT	The request is being invoked for the first time (a start time was specified, but it has not been reached).
INV	The request terminated because of an invalid parameter or measurement. The BBI-SS PAS Journal log contains a descriptive message of the error.
LOCK	A LOCK command was issued for the service or the service abended.
QIS	The service is quiesced, because the target DB2 is not active.
RST	The target DB2 restarted. The request is waiting until the current interval expires before performing restart processing as specified by the RST keyword in the original request.

Application Transfer Commands

The following application transfer commands can be entered on the COMMAND line of the Active Timer Requests list application showing all timer requests:

SM (START MONITORS)
DM (DMON)
DW (DWARN)

SM (START MONITORS)

SM displays the Data Collection Monitors panel, which lists all the data collection monitor services you are authorized to view. (See Chapter 19, “Data Collection Monitors (SM Command)” on page 359.) From this panel you can use the S line command to select the data entry panel to start a timer request for any of the listed monitors.

DM (DMON)

DM displays the DMON service (see “Active Monitor Summary Display (DMON)” on page 101), which displays global data about the status and operation of active monitor services. If a warning threshold (WVAL) is specified with the monitor request, a graphic trend display is shown.

DW (DWARN)

DW displays the DWARN service (see “Active Monitor Warning Display (DWARN)” on page 103), which displays the status of active monitor services that currently exceed the threshold set with the WVAL parameter of the monitor request.

Primary Commands

The following primary commands can be entered on the COMMAND line of the Active Timer Requests list application showing all timer requests:

SORT
AREA
X ON|OFF

SORT

When the list of active timer requests is displayed initially, the list is sorted in the order the requests were made. SORT can be entered on the COMMAND line of the display to sort the list by any of the column headings. The first two characters of the column heading are used with SORT as

```
SORT cc
```

where `cc` can be any of the following two characters:

SE	Sorts the list alphabetically by service name (SERV column).
TI	Sorts the list alphabetically by service title (TITLE column).
CU	Sorts the numerical values in descending order (CURRENT column).
WV	Sorts the numerical values in descending order (WVAL column).
US	Sorts the list alphabetically by user ID (USER ID column).
TA	Sorts the list alphabetically by target ID (TARGET ID column).
SC	Sorts the list alphabetically by the security code.
AR	Sorts the list by the resource area (AREA column) as organized in Part 4, “Monitors (Early Warnings/Recent History)” on page 321.
ST	Sorts the list alphabetically by the service status displayed (STAT column).

AREA

You can use the AREA command to list only the services related to a specified area. The possible areas that can be specified are listed in the AREA column. For example, to list only the DB2 workload services, type on the COMMAND line

```
AREA WKLD
```

Type AREA to return to the list of all the services.

X ON|OFF

To display only the requests that are in warning status, type X ON in the command line and press ENTER. To display all requests, type X OFF in the command line and press ENTER. The default is to display all requests.

Line Commands

Entering one of the following one-character line commands in the LC field for a service executes the line command function. Multiple selections can be entered at one time by selecting a series of services and pressing the ENTER key. Each display in a series is processed by pressing the END key. Each data entry timer request panel in a series that is to be modified or purged is submitted by pressing the ENTER key then the END key to process the next request.

Line Command	Description
S	SELECT. Displays a plot of collected data or a list of scrollable trace entries. Selecting an active request for a resource or workload monitor service displays a plot of the data collected by the selected request (see “History PLOT Display (S Line Command for Monitor Request)”). **Note:** The S line command (SELECT a plot) is not valid for an active Image log request of an analyzer or general service display.
W	SHOW. Shows a display panel of the timer request options defined for the selected request for viewing only (see “Show Timer Request (W Line Command)” on page 354).
M	MODIFY. Shows a data entry panel of the timer request options defined for the selected request so the options can be changed (see “Modify Timer Request (M Line Command)” on page 355).
P	PURGE. Displays a PURGE panel to verify a purge of the selected request (see “Purge Request (P Line Command)” on page 357).
R	REPLICATE. Shows a data entry panel of all the timer request options defined for the selected request so that the options can be repeated or changed to make a new request for that service (see “Replicate Timer Request (R Line Command)” on page 356). The request must be unique (defined by the service select code plus a parameter).
H	HELP. Displays HELP information about the service for the selected request. Using H for a display service request shows the service title, describes what the service does, and defines any parameters. Using H for a monitor request shows the service title, describes the value measured by that monitor service, defines any parameters, and shows the format of the monitor warning message.
Z	Stops the request and retains collected data. The STOP time equals the current time.

History PLOT Display (S Line Command for Monitor Request)

The S line command displays a graphic history plot of the data collected by the selected monitor service. It generates the display described in “Monitor History Display (PLOT)” on page 95.

Show Timer Request (W Line Command)

The W line command can be used for any request shown in the Active Timer Requests list. The request types in the list are either for time-driven data collection monitor services or Image logging requests of monitor summary (DMON or DWARN) or analyzer service displays. Selecting a request with the W line command generates a display panel of the previously defined options for that SET timer request, as shown by the example in Figure 59:

```
BOOLE AND BABBAGE  ------ SHOW RESOURCE MONITOR REQUEST -----  PERFORMANCE MGMT
COMMAND ===>                                                  TGT ===> DB2A

                       DSOPR - DB DATASET OPEN REQUESTS

PARM:       BP0                           (Resource Selection Parameter)

INTERVAL:   00:01:00  START:   09:18:00   STOP:                   QIS:   YES

WVAL:       3         WMSG:               WLIM:   10   WIF:   1    WIN:   1

RST:        HOT                           (Restart Option: HOT,COLD,PUR,QIS)

TITLE:      DB DATASET OPEN REQUESTS      (Title)

PLOTMAX:                                  (Maximum PLOT X-Axis Value)

RANGES:                                   (1-4 Range Distr. Upper Limits)

LOG:        NO                            (NO,ATSTOP,ATPD,ATINTVL,ATWARN)
```

Figure 59. Show Timer Request Options Application

Each option is suffixed by a colon (:), which means the option value cannot be changed. The options are defined in “The SET Timer Request” on page 75. Pressing the END key redisplays the Active Timer Requests list.

Monitor or Trace Request

Selecting a request for a monitor or trace service with the W line command shows the options that were requested to activate data collection by this monitor service (see Figure 59). It is used to only view the options not to change them. Figure 59 is an example of a resource monitor request. The panels for workload monitor requests show the different options available for these services (see “Start Workload or Resource Monitor (S Line Command)” on page 362).

Image Log Request

The W line command for a logging request, a monitor summary (DMON or DWARN), or analyzer service display shows the previously defined options for BBI-SS PAS Image logging with a colon (:) suffix (see “Start Image Log Request (I Line Command)” on page 124). It is used to only view the options not to change them.

Modify Timer Request (M Line Command)

Selecting a request with the M line command displays a data entry panel with the options that were defined to activate data collection for a monitor service or Image logging for a display service. Previously defined option values that are prefixed with an ===> can be changed, as shown by the example in Figure 60.

```
BOOLE AND BABBAGE  ---- MODIFY RESOURCE MONITOR REQUEST ---  REQUEST ACCEPTED
COMMAND ===>                                                   TGT ===> DB2A

                       THDQD - QUEUED THREADS

PARM:                                      (Resource Selection Parameter)

INTERVAL:   00:00:20  START:   09:18:00   STOP ==>                QIS ==> YES

WVAL    ==> NZ       WMSG  ==>            WLIM ==> 10  WIF ==> 1   WIN ==> 1

RST     ==> HOT                           (Restart Option: HOT,COLD,PUR,QIS)

TITLE:      QUEUED THREADS                (Title)

PLOTMAX ==>                               (Maximum PLOT X-Axis Value)

RANGES:                                   (1-4 Range Distr. Upper Limits)

LOG     ==> ATWARN                        (NO,ATSTOP,ATPD,ATINTVL,ATWARN)
```

Figure 60. Modify Timer Request Options Application

Values shown for options with a colon (:) suffix cannot be changed. The options are defined in "The SET Timer Request" on page 75.

The request is submitted when the ENTER key is pressed. A short message in the upper right corner of the display shows the result of the request. If an ERROR IN REQUEST message is displayed, a short explanatory message is displayed on the third line. Pressing the END key (PF3/15) redisplays the Active Timer Requests list.

Resource Monitor Request

The M line command for a resource monitor service displays the timer request options used to start data collection (see "Start Workload or Resource Monitor (S Line Command)" on page 362). As shown in Figure 60, the following options have fields prefixed with an ===> (their displayed values can be changed):

SET Option	Description
STOP	Service stop time
QIS	Service quiesce state
WVAL	Warning threshold
WMSG	Warning message routing
WLIM	Maximum warning messages
WIF	Number of intervals before first warning
WIN	Number of intervals between warnings
RST	Service restart
PLOTMAX	Maximum X-axis value for plot display
LOG	Automatic BBI-SS PAS Image logging of PLOT display (default is NO)

Workload Monitor Request

The options that can be modified for workload monitor requests are the same as those listed above for resource monitor requests.

Note: Workload monitor selection criteria cannot be modified.

Image Log Request

The M line command for an analyzer or monitor summary service displays the SET timer request options used to log the service display to the BBI-SS PAS Image log (see "Start Image Log Request (I Line Command)" on page 124). The following options have fields prefixed with an ===> (their displayed values can be changed):

SET Option	Description
STOP	Service stop time
QIS	Service quiesce state
RST	Service restart

Replicate Timer Request (R Line Command)

The R line command displays a data entry panel for the selected service, as shown in Figure 61.

```
BOOLE AND BABBAGE  --- REPLICATE RESOURCE MONITOR REQUEST ---  PERFORMANCE MGMT
COMMAND ===>                                                   TGT ===> DB2A

                       THDQD - TSO QUEUED THREADS

PARM     ==> TSO                          (Resource Selection Parameter)

INTERVAL ==> 00:01:00 START ==> 12:51:00  STOP ==>                QIS ==> YES

WVAL     ==> 4        WMSG  ==> WTO       WLIM ==> 5   WIF ==> 1   WIN ==> 1

RST      ==> HOT                          (Restart Option: HOT,COLD,PUR,QIS)

TITLE    ==> TSO QUEUED THREADS           (Title)

PLOTMAX  ==>                              (Maximum PLOT X-Axis Value)

RANGES   ==>                              (1-4 Range Distr. Upper Limits)

LOG      ==> ATWARN                       (NO,ATSTOP,ATPD,ATINTVL,ATWARN)
```

Figure 61. Replicate Timer Request Options Application

All of the options that were defined to start the request are displayed (see "Start Workload or Resource Monitor (S Line Command)" on page 362). All values prefixed with an ===> can be modified. This application can be used to start a new request for the selected service. "The SET Timer Request" on page 75 describes each option and the value that can be specified. Each request must be defined by a unique parameter in the PARM field.

Pressing the ENTER key submits the request. A short message in the upper right corner of the display shows the result of the request. If an ERROR IN REQUEST message is displayed, a short explanatory message is displayed on the third line. Pressing the END key (PF3/15) redisplays the Active Timer Requests list.

Monitor or Trace Request

Using the R line command for a monitor or trace service displays all of the options previously defined to start data collection for the selected request (see “Start Workload or Resource Monitor (S Line Command)” on page 362). All the option values can be replicated or changed and submitted by using the ENTER key, as long as the request is unique.

Image Log Request

Using the R line command for a display service shows all of the options previously defined to log the display to the BBI-SS PAS Image log (see “Start Image Log Request (I Line Command)” on page 124). All the option values can be replicated or changed and submitted by using the ENTER key, as long as the request is unique.

Purge Request (P Line Command)

Selecting a service with the P line command displays a purge confirmation panel, shown by Figure 62.

```
BOOLE AND BABBAGE  ---------- CONFIRM PURGE REQUEST -------  REQUEST ACCEPTED
COMMAND ===>                                                   TGT ===> DB2A

                      #SQLD  - DDL SQL STATEMENTS


PARM:                                        Parameter / Identifier

STATUS:        ACTV
START:         12:01:00 (0  days)
STOP:


INSTRUCTIONS:

   Press ENTER key to confirm purge request.

   Enter END command to cancel purge request.
```

Figure 62. Purge Request Application

Pressing the ENTER key confirms a purge of the selected service request. A short message in the upper right corner of the display shows the result of the request. If an ERROR IN REQUEST message is displayed, a short explanatory message is displayed on the third line. Pressing the END key (PF3/15) redisplays the Active Timer Requests list.

To stop a request and retain online plot or trace, use the modify command and enter a stop time. This allows information to remain after collection stops. If a request is purged, all data is lost.

Stop Timer Request (Z Line Command)

The Z line command sets the STOP time of the selected timer request to the current time. Data collection stops, but previously collected data is retained.

Chapter 19. Data Collection Monitors (SM Command)

This application is a scrollable list of all the data collection monitor services you are authorized to view. Use this application to activate new monitors.

```
BOOLE AND BABBAGE ---------- DATA COLLECTION MONITORS -------- PERFORMANCE MGMT
COMMAND ===>                                                 TGT ===> DB2C

COMMANDS: SORT, AREA
LC CMDS: S(SET UP), D(DISPLAY ACTIVE), H(HELP)
LC   SERV    # ACTIVE  TITLE                     PARM TYPE    SEC  AREA   STAT
     SOSAB        1    SOS ABENDS                              A   DSYS
     SOSCN        1    SOS CONTRACTIONS                        A   DSYS
     DSOPN        1    DB DATA SETS OPEN                       A   DSYS
     DSOPR        5    DB DATASET OPEN REQUESTS  (POOLID)      A   DSYS
     DSUTL        1    OPEN DB DATASET % UTIL                  A   DSYS
     CONUT        3    CONNECTION % UTILIZATION  (TSO/BATCH)   A   USER
     THDUT        1    THREAD % UTILIZATION                    A   USER
     THDAC        7    ACTIVE THREADS            (ATTACH-MODE) A   USER
     THDQD        1    QUEUED THREADS            (ATTACH-MODE) A   USER
     THDID        1    IN DOUBT THREADS                        A   USER
     THDCR        1    CREATE THREAD REQUESTS                  A   USER
     THDWT        1    CREATE THREAD WAITED                    A   USER
     THDAB        1    ABORTED THREADS                         A   USER
     COMP2        1    PHASE 2 COMMITS                         A   USER
     COMSY        1    SYNC COMMITS                            A   USER
     EOMFL        1    EOM FAILURES                            A   USER
     EOTFL        1    EOT FAILURES                            A   USER
     BINDS        1    SUCCESSFUL AUTO BINDS                   A   USER
     BINDF        1    FAILED AUTO BINDS                       A   USER
```

Figure 63. Data Collection Monitors Application

This application allows service selection by line command and shows how many monitors are already active, the allowable parameters for each service, the service security classification, the area of DB2 being monitored, and the service status by

Field Name	Description
LC	A line command input field. One-character line commands can be entered in this field. The line commands can be used to access a data entry panel to define the options to activate a new SET timer request, display HELP information, or show a list of active timer requests for the selected monitor (see “Line Commands” on page 361). The Active Timer Requests list can be used with line commands to view, modify, or replicate the data collection options for a selected request, as described in Chapter 18, “Active Timer Requests (Option 3)” on page 347.
SERV	A scrollable list of all the data collection monitor services by service select code.
# ACTIVE	The number of timer requests already active for the service.
TITLE	The service title.
PARM TYPE	A short description of the parameters that can be used, if the service allows parameters. The applicable parameters are listed in the table in “Monitor Services” on page 44. Optional parameters are shown in parentheses.

SEC The security code for user access to the service.

AREA The DB2 resource area being analyzed. This field could contain

Field Data	Description
DSYS	General DB2 system
USER	User activity
LOCK	Resource or user locks
EDM	Environmental Descriptor Manager pool
BUFR	DB2 buffer pools
LOG	DB2 logs
DMVS	MVS services
WKLD	DB2 workload

STAT The service status (LOCK, TEST, or blank).

Primary Commands

The following commands can be entered on the COMMAND line of the Data Collection Monitors list application:

SORT
AREA

SORT

When the list of data collection monitor services is displayed initially, the list is sorted by resource area. SORT can be used to sort the list by any of the following column headings. The first two characters of the column heading are used with SORT as follows:

```
SORT cc
```

where `cc` can be any of the following two characters:

SE Sorts the list alphabetically by service name (SERV column).
AC|#A Sorts the list in a numerically descending order (# ACTIVE column).
TI Sorts the list alphabetically by service title (TITLE column).
SC Sorts the list alphabetically by the security code.
AR Sorts the list alphabetically by the resource area (AREA column) as organized in Part 4, “Monitors (Early Warnings/Recent History)” on page 321 and by the service name within the area.
ST Sorts the list alphabetically by the service status displayed (STATUS column).

SORT without parameters sorts the list by resource area.

AREA

You can use the AREA command to list only the services related to a specified area. The possible areas that can be specified are listed in the AREA column. For example, to list only the general DB2 system services, type on the COMMAND line

```
AREA DSYS
```

Type AREA to return to the list of all the services.

Line Commands

Entering one of the following one-character line commands in the LC field for a service executes the line command function. Multiple selections can be entered at one time by selecting a series of services and pressing the ENTER key. Each data-collection timer request in a series is submitted by pressing the ENTER key then the END key to process the next request.

Line Command	Description
S	SETUP. Displays a data entry panel showing the valid request options to start timer-driven data collection (see "Start Workload or Resource Monitor (S Line Command)" on page 362). Each timer-driven request must be unique and is defined by the service select code and an optional parameter.
D	DISPLAY. Displays only those timer-driven requests that are active for the selected monitor, as shown by "Active Timer Requests for a Selected Monitor (D Line Command)" on page 367.
H	HELP. Displays the HELP information for the service. This shows the service title, describes the measured value, defines any parameters, and shows the format of the monitor warning message.

The following commands are for system programmer use and are restricted by a security access code:

L	LOCK. Locks this service. The service cannot be used again until it is unlocked.
U	UNLOCK. Unlocks this service. A service can be locked by the use of the LOCK command or a service ABEND.
T	TEST. BMC Software use only.

Start Workload or Resource Monitor (S Line Command)

Each request must be unique and is defined by the service select code and an optional parameter (reqid). The parameter is required if the same service is requested more than once. The service field is preset with the code of the selected service. The input fields are prefixed with a highlighted `===>` symbol. Any default values for a field are displayed.

The request is submitted when the ENTER key is pressed. A short message in the upper-right corner of the display shows the result of the request. If an ERROR IN REQUEST message is displayed, a short explanatory message is displayed on the third line. Pressing the END key (PF3/15) redisplays the Data Collection Monitors list.

Workload Monitor Data Entry Panel

This data entry panel shows the options that can be specified to request data collection for the selected workload monitor.

```
BOOLE AND BABBAGE  --- START DB2 WORKLOAD MONITOR REQUEST ---  PERFORMANCE MGMT
COMMAND ===>                                                  TGT ===> DB2C

                      #DDLK - DEADLOCKS

PARM     ==>                                (Workload Monitor Identifier)
INTERVAL ==> 00:01:00 START ==>             STOP ==>                 QIS ==> YES
WVAL     ==>          WMSG  ==>             WLIM ==> 10  WIF ==> 1   WIN ==> 1
TITLE    ==>                                (Title)
RST      ==> HOT                            (Restart Option: HOT,COLD,PUR,QIS)
PLOTMAX  ==>                                (Maximum PLOT X-Axis Value)
RANGES   ==>                                (1-4 Range Distr. Upper Limits)
LOG      ==>                                (NO,ATSTOP,ATPD,ATINTVL,ATWARN)
Specify Selection Criteria:
   ICHECK   ==> NO                          (Check elapsed versus Interval time)
   CONNTYPE ==>                             (TSO, IMS, CICS, BATCH, CAF or blank)
   DB2PLAN  ==>
   DB2AUTH  ==>
   DB2CONN  ==>
   DB2CORR  ==>
   DB2LOC   ==>
```

Figure 64. The Start Workload Monitor Data Collection Request Application

where

INTERVAL hh:mm:ss

The time interval between successive invocations of the requested service. The default is one minute (00:01:00) or as specified in the BBIISP00 member of the BBPARM data set.

START hh:mm:ss

Requests processing start time. If the time entered is more than 10 minutes prior to the current time, 24 hours are added to the specified time and the request is started the next day. To start a request at midnight, specify 24:00:00.

Default is the next full minute.

STOP hh:mm:ss|nnn

Requests processing stop limit, either as a timestamp or the number of intervals to process. If the time entered is the same as the START time, 24 hours are added to the STOP time.

Processing ends at the end of the last interval before the specified stop time. This time is displayed in the STOP field when the request is viewed with the R, P, M, and W line commands from the Active Timer Requests application.

QIS YES|NO

Defines the action to be taken for the service when DB2 is not active.

YES
Specifies that the service is to be quiesced. This is the default for all analyzer and monitor services.

NO
Specifies that the service is to start or continue running.

Note: When QIS=NO is specified, monitors that require DB2 continue to be scheduled at each interval; however, they return zero values.

WVAL n|<n

Specifies a warning threshold. The warning condition exists if the current data measurement exceeds the defined threshold. If <n is specified, a warning is issued when the sampled value is less than or equal to the threshold.

WMSG WTO|LOG|tso id

Directs warning messages to the system console (WTO) or a TSO ID in addition to the active BBI-SS PAS Journal log. Default is to write only to the log.

If an ID is entered, a TSO send is done for the warning and warning clear messages, but not for the monitor start / stop / quiesce messages.

Only one TSO ID of four or more characters can be specified. If less than four characters are specified, the value must be either LOG or WTO.

An existing warning message to the WTO can be reset to the Journal log only by using the LOG operand.

Routing and descriptor codes can be specified for WTO messages in the BBIISP00 member of the BBPARM data set.

WLIM n

Defines the maximum number of warning messages to be sent for one continuous occurrence of the warning condition. Resets automatically when condition no longer exists.

Default is 10.

WIN n

Defines the number of times the exception is to be detected between messages.

Default is 1.

TITLE 'c...c'

Defines a service display title and the contents of a warning message (1 to 24 characters). This user-defined title replaces the default service title.

RST HOT|COLD|PUR|QIS

Defines the restart option to be used when a service is quiesced because of an inactive DB2 subsystem or SETBLK=RRR request. Default is HOT.

HOT
: Restarts the service automatically without the loss of history data. The intervals during which DB2 was terminated show values of zero.

COLD
: Restarts the service automatically; all previously collected data is deleted.

PUR
: Purges the service automatically when the target DB2 starts.

QIS
: Keeps the service in a quiesced state until it is purged by an authorized user.

PLOTMAX n

Specifies the maximum value for the X-axis of a PLOT graph. Minimum is 50. The specified value is adjusted to the nearest multiple of 50. Percentages displayed by some services are always set at 100.

RANGES n [,n,n,n]

Up to four upper-limit values can be specified for the distribution range of any data collection monitor service. An implied limit of the maximum data measurement value is always defined internally. This information is used to produce a frequency distribution of the data measurement value at the bottom of the plot display (see "Monitor History Display (PLOT)" on page 95).

If RANGES is defined, the distribution is updated at each interval with the current measurement value. A plot of the history displays this distribution.

Default is no ranges.

LOG NO|ATSTOP|ATPD|ATINTVL|ATWARN

Specifies if and when automatic logging of the PLOT display to the BBI-SS PAS Image log occurs.

NO
No logging. Default for monitor services.

ATSTOP
Logs display when processing of this request is stopped. If QIS=Y has been specified in the request, LOG=ATSTOP is invoked at DB2 termination and at BBI-SS PAS termination.

ATPD
Logs display at each period of 10 intervals.

ATINTVL
Logs display at each interval.

ATWARN
Logs a plot whenever a warning message is generated by the associated monitor.

ICHECK YES|NO

Qualifies workload monitor data collection.

YES
The transaction is discarded if the elapsed time is greater than the requested interval time.

NO
The default.

CONNTYPE TSO|IMS|CICS|BATCH|CAF|IMSMPP|IMSBMP|IMSTBMP|IMSCTL|DLI|SYSSERV|APLSERV|UTIL|blank

Qualifies workload monitor data collection by connection type.

Blank collects data for all connection types.

DB2PLAN name

Qualifies workload monitor data collection by a 1- to 8-character DB2 plan name. The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

DB2PKG name

Qualifies workload monitor data collection by a 1- to 18-character DB2 package name (only when accounting class 7/8 is active). The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

DB2AUTH id

Qualifies workload monitor data collection by DB2 authorization ID. The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

DB2CONN name

Qualifies workload monitor data collection by a 1- to 8-character connection name. The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

DB2CORR id

Qualifies workload monitor data collection by a 1- to 8-character correlation ID. The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

DB2LOC id

Qualifies workload monitor data collection by a 1- to 16-character location ID. The maximum number of operands is the total field length (60 characters). The operands can contain + characters as name qualifiers.

Both server and requester activity with this location is selected (DBAT and DIST threads).

Resource Monitor Data Entry Panel

This data entry panel shows the options that can be specified to request data collection for the selected resource monitor. The previous descriptions apply also to the Resource Monitor requests.

```
BOOLE AND BABBAGE  ----- START RESOURCE MONITOR REQUEST ---  REQUEST ACCEPTED
COMMAND ===>                                                  TGT ===> DB2A

                       THDQD - QUEUED THREADS

PARM     ==> TSO                          (Resource Selection Parameter)

INTERVAL ==> 00:01:00 START ==>           STOP ==>                QIS ==> YES

WVAL     ==> 4        WMSG  ==> WTO       WLIM ==> 5   WIF ==> 1   WIN ==> 1

RST      ==> HOT                          (Restart Option: HOT,COLD,PUR,QIS)

TITLE    ==> TSO QUEUED THREADS           (Title)

PLOTMAX  ==>                              (Maximum PLOT X-Axis Value)

RANGES   ==>                              (1-4 Range Distr. Upper Limits)

LOG      ==> ATWARN                       (NO,ATSTOP,ATPD,ATINTVL,ATWARN)
```

Figure 65. Start Resource Monitor Data Collection Request Application

Active Timer Requests for a Selected Monitor (D Line Command)

This list application shows each active timer request for only the service selected from the Data Collection Monitors list with the D line command. Its use is described in Chapter 18, “Active Timer Requests (Option 3)” on page 347.

```
BOOLE AND BABBAGE  --------- ACTIVE TIMER REQUESTS ----------  PERFORMANCE MGMT
COMMAND ===>                                                  TGT ===> DB2A
                                  INPUT    INTVL ==> 3      TIME --  10:52:10
COMMANDS: SM (START MONITORS), SORT, AREA, X ON|OFF, DM (DMON), DW (DWARN)
LC CMDS: S (SELECT), W (SHOW),      M(MODIFY),
         P (PURGE),  R (REPLICATE), H (HELP), Z (STOP)
LC  SERV  PARAMETER  TITLE                    USER ID  TARGET  SEC AREA  STAT
    DSOPR            DB DATASET OPEN REQUESTS CIR8X    DB2A     A  DSYS  ACTV
    DSOPR BP0        DB DATASET OPEN REQUESTS CIR8X    DB2A     A  DSYS  ACTV
    DSOPR BP1        DB DATASET OPEN REQUESTS CIR8X    DB2A     A  DSYS  ACTV
    DSOPR BP2        DB DATASET OPEN REQUESTS CIR8X    DB2A     A  DSYS  ACTV
    DSOPR BP32       DB DATASET OPEN REQUESTS CIR8X    DB2A     A  DSYS  ACTV
     *************************** END OF REQUESTS ***************************
```

Figure 66. Selected Monitor Active Timer Requests List

Chapter 20. Using Monitors

You can issue requests to

- Access the monitors easily through ISPF-like menus and scrollable lists
- Move quickly from a resource analyzer display to a set of related resource monitors
- Move quickly from the LTRAC or STRAC trace display service to a set of related workload monitors
- View plot or graphic monitor summary displays that can be refreshed in a user-defined cycle
- Start or stop a monitor from an AutoOPERATOR EXEC
- Start a series of monitors automatically when the system starts or at your request
- Print a screen image of a monitor plot or graphic summary display to the online BBI-SS PAS Image log automatically or to the TS Image log or your BBISPRNT data set

These methods are described in the following sections.

Starting a Monitor

A monitor can be started by

- Selecting one or more services from a monitor service list

  Access the Data Collection Monitors list with the SM application transfer command from the list of active timer requests (Option 3). Then use the S line command to select a service (see Chapter 19, “Data Collection Monitors (SM Command)” on page 359).

  The workload monitor service names start with either a # or @ prefix.

- Replicating an active monitor request from the Active Timer list application

  You can replicate a monitor service request by using the R line command in the Active Timer list.

  – Access the Active Timer list application directly from the Primary Option Menu (Option 3) to view all monitors.

  – Use the D line command from the Data Collection Monitors service list application to access the Active Timer list for only the selected service.

  – Move the cursor to the EXPAND line for the MON(xxxx) field in a resource analyzer or application trace display and press ENTER to view related monitors in the Active Timer list (see the *Using MAINVIEW* manual).

- Starting a monitor service from BBPARM with other service requests

  Define a series of SET requests as a member of your BBI-SS PAS BBPARM data set that can be started automatically when the system starts or at your request (see “Grouping Requests” on page 70).

- Starting a monitor service from an AutoOPERATOR EXEC

  Write an EXEC that starts a monitor service (a BMC Software AutoOPERATOR product must be installed).

  Use the IMFEXEC IMFC command followed by the service name, optional parameters, and an identifier for the target DB2 system, as follows:

  ```
  IMFEXEC IMFC SET REQ=BPUTL BP0 I=00:06:00 TARGET=db2ssid
  ```

Displaying Monitor Data

A display of the data collected by monitors can be requested by

- Selecting a scrollable list of active monitors and their current values as described in Chapter 18, “Active Timer Requests (Option 3)” on page 347
  - Access the Active Timer Request list application directly from the Primary Option Menu (Option 3) to view all active monitors.
  - Move the cursor to the EXPAND line for the MON(xxxx) field in a resource analyzer or application trace display and press ENTER to view related monitors in the Active Timer list application (see the *Using MAINVIEW* manual).
  - Use the D line command from the Data Collection Monitors service list application to access the Active Timer list for only the selected service.
- Selecting an active monitor summary display (DMON)
  - Use the DM application transfer command.
  - Invoke the DMON service from the Service Display panel.
- Selecting an active monitor warning display (DWARN)
  - Use the DW application transfer command.
  - Invoke the DWARN service from the Service Display panel.
- Selecting a graphic plot of the historical data collected by one monitor
  - Use the S line command in the Active Timer list (Option 3) to select a plot of the data collected by that active monitor.
  - Move the cursor to one of the monitor requests in a DMON or DWARN display and press ENTER to view a plot of data collected by that monitor as described in “Active Monitor Summary Display (DMON)” on page 101 and “Active Monitor Warning Display (DWARN)” on page 103.
  - Invoke the PLOT service from the Service Display panel as described in “Monitor History Display (PLOT)” on page 95.
- Setting up monitor graphic displays for timed, cyclic refresh

  Select Option C, CYCLE SETUP, from the Primary Option Menu to set up a continuous timed cycle of refreshable monitor plot (PLOT, with a service name parameter) or graphic summary displays (DMON or DWARN) (see the *Using MAINVIEW* manual).

Logging Monitor Data

An image of a monitor plot or graphic summary display (DMON or DWARN) can be recorded in the BBI-SS PAS Image log automatically or to your TS Image log or BBISPRNT data set at your request by

- Logging an image to the BBI-SS PAS Image log
  - Specify the LOG option when starting the monitor or modifying it.
  - Write an EXEC that defines a SET log request for a monitor plot or graphic summary display (DMON or DWARN) (a BMC Software AutoOPERATOR product must be installed).

    Use the IMFEXEC IMFC command followed by the service name, an optional parameter, and an identifier for the target DB2 system as

    ```
    IMFEXEC IMFC SET REQ=BPUTL BP0 WMAX=80,LOG=ATWARN TARGET=db2ssid
    ```

    or

    ```
    IMFEXEC IMFC DMON BPUTL I=00:05:00 TARGET=db2ssid
    ```
  - Define a SET log request for a graphic summary display (DMON or DWARN) as a member of your BBI-SS PAS BBPARM data set that can be started automatically when the system starts or at your request (see “Grouping Requests” on page 70).
- Logging a display image record to the TS Image log

  Enter a Y in the LOG field of the plot or graphic summary display (DMON or DWARN) to record the image in your TS Image log.
- Logging a screen image to your BBISPRNT data set

  Press the PF4/16 key to record a plot or graphic summary display image in your BBISPRNT data set.

BBSAMP member ILOGJCL can be used to create a hardcopy of your Image log data sets. BBSAMP member SLOGJCL can be used to create a hardcopy of your BBISPRNT data set.

Stopping a Monitor

A monitor service or Image log request can be stopped by

- Stopping the monitor request with a Z line command

  Use the Z line command from the Active Timer list application as described in Chapter 18, “Active Timer Requests (Option 3)” on page 347.

- Setting a stop time for automatic completion of data collection

  Specify the STOP value (as a timestamp or interval count) on the Start or Modify panel for the monitor. The collected data remains available for viewing until the monitor is purged.

- Purging a request from the Active Timer list with a P line command

  Use the P line command from the Active Timer list application as described in Chapter 18, “Active Timer Requests (Option 3)” on page 347.

- Purging a service request with a SET request

  Issue a PRG request with SET from the Service Display panel (Option 4 from the Primary Option Menu), BBPARM (see “Grouping Requests” on page 70), or an AutoOPERATOR EXEC (an AutoOPERATOR product must be installed). For example:

  ```
  SET
  PRG=reqid|ALL
  ```

- Stopping a service with a SET request

  Use the STOP or STOPCNT parameter with SET. For example:

  ```
  SET
  REQ=#SQLA,START=00:11:00,STOP=00:12:00,LOG=ATSTOP,I=00:01:00
  ```

  The request starts at 11 minutes after midnight and stops 12 minutes after midnight; the plot display is logged to the BBI-SS PAS Image log when the request stops.

  These SET parameters are described in “The SET Timer Request” on page 75.

Chapter 21. General DB2 System Monitors

These services measure general DB2 system activity and status. For example, to activate the DSOPN service to track the number of open DB2 database data sets and log a plot of the collected data to the BBI-SS PAS Image log every hour, the service request is

```
SET
REQ=DSOPN,INTERVAL=00:06:00,LOG=ATPD
```

DSOPN—Database Data Sets Open

Select Code: DSOPN

Parameter: None

Measurement: The number of open DB2 database data sets when sampled.

Data Type: Status

Default Title: DB DATA SETS OPEN

Warning: `DS0030W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

DSOPR—Database Data Set Open Requests

Select Code: DSOPR

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of successful open requests for database data sets (by Buffer Pool) during the specified time period.

Note: If many databases are defined to be opened automatically at DB2 startup, there will be a large amount of activity causing a spike in this measurement at startup.

Data Type: Count

Default Title: DB DATA SET OPEN REQUESTS

Warning: `DS0040W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DSUTL—Open Database Data Set Utilization

Select Code:	DSUTL
Parameter:	None
Measurement:	The percentage of the maximum number of concurrently accessible DB2 database data sets (DSNZPARM value DSMAX) that are open at the specified time interval.
Data Type:	Percent
Default Title:	OPEN DB DATA SET % UTIL
Warning:	`DS0050W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

Chapter 22. User Activity Monitors

These services measure user activity. For example, to activate the THDQD service to track the number of queued threads, issue a warning message (5 maximum) to the system console if the number of queued threads is greater than 4, and log a plot of the collected data to the BBI-SS PAS Image log when the message is generated, the service request is

```
SET
REQ=THDQD,WMSG=WTO,WMAX=4,WLIM=5,LOG=ATWARN
```

CONUT—Connection Percent Utilization

Select Code: CONUT

Parameter: This can be one of the following parameters:

TSO	TSO
BATCH	Batch
DBAT	Database Access
Blank	For all

Measurement: The percent (number of active out of total allowable) connections active at the specified time interval. The total allowable connections are defined by IDFORE (TSO foreground (QMF or DB2I)), IDBACK (TSO background (batch jobs, CAF, or utilities)), and MAXDBAT in DSNZPARM. When all are monitored (blank parameter), the sum is used as the maximum.

Note: Connections to IMS and CICS are not limited by these parameters and therefore are not measured.

Data Type: Percent

Default Title: CONNECTION % UTILIZATION

Warning: `DS0060W (nn) hh:mm:ss title(parm) = v (>thrshld)`

THDUT—Thread Percent Utilization

Select Code: THDUT

Parameter: None

Measurement: The active thread percentage (number active out of total allowable) at the specified time interval. The total allowable threads is defined by CTHREAD in DSNZPARM.

Data Type: Percent

Default Title: THREAD % UTILIZATION

Warning: `DS0070W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

THDAC—Active Thread Status

Select Code: THDAC

Parameter: one of the following parameters:

TSO	TSO
BATCH	Batch
CAF	Call Attach Facility
UTIL	Utility
IMS	IMS
CICS	CICS
DBAT	Database Access (DDF servers)
DIST	Distributed Allied Agent (DDF requestors)
DDF	Both DBAT and DIST
SPAS	Stored Procedures
RRSAF	Recoverable Resource Manager Services Attachment Facility
Blank	For all

Measurement: The number of active threads when sampled.

Data Type: Status

Default Title: ACTIVE THREADS

Warning: `DS0080W (nn) hh:mm:ss title(parm) = v (>thrshld)`

THDQD—Queued Thread Status

Select Code: THDQD

Parameter: one of the following parameters:

TSO	TSO
BATCH	Batch
CAF	Call Attach Facility
UTIL	Utility
IMS	IMS
CICS	CICS
SPAS	Stored Procedures
RRSAF	Recoverable Resource Manager Services Attachment Facility
Blank	For all

Measurement: The number of queued threads when sampled.

Data Type: Status

Default Title: QUEUED THREADS

Warning: `DS0090W (nn) hh:mm:ss title(parm) = v (>thrshld)`

DBTQD—Database Thread Queued

Select Code: DBTQD

Parameter: None

Measurement: The number of times a database access thread was queued because the number of concurrent remote threads was already at a maximum (QDSTQDBT).

Data Type: Count

Default Title: DATABASE THREAD QUEUED

Warning: `DS0650W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

THDID—In Doubt Thread Status

Select Code: THDID

Parameter: None

Measurement: The number of in doubt threads when sampled.

Note: Only IMS or CICS threads can be in doubt.

Data Type: Status

Default Title: IN DOUBT THREADS

Warning: `DS0100W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

THDCR—Create Thread Requests

Select Code: THDCR

Parameter: None

Measurement: The count of successful CREATE THREAD requests during the specified time interval.

Data Type: Count

Default Title: CREATE THREAD REQUESTS

Warning: `DS0110W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

THDWT—Create Thread Waited

Select Code: THDWT

Parameter: None

Measurement: The count of CREATE THREAD requests that waited for a thread during the specified time interval.

Data Type: Count

Default Title: CREATE THREAD WAITED

Warning: `DS0120W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

THDAB—Rollback Requests

Select Code: THDAB

Parameter: None

Measurement: The count of rollback requests during the specified time interval.

Rollback requests indicate the number of times a unit of recovery was backed out due to

- Application program abend
- Application rollback request
- Application deadlocked on database records
- Application cancelled by operator
- Threads abend caused by resource shortage

Data Type: Count

Default Title: ROLLBACK REQUESTS

Warning: `DS0130W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

COMP2—Phase 2 Commits

Select Code: COMP2

Parameter: None

Measurement: The count of successful phase 2 commit requests during the specified time interval. Two-phase commit is used by both IMS and CICS transactions.

Data Type: Count

Default Title: PHASE 2 COMMITS

Warning: `DS0140W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

COMSY—Sync Commits

Select Code: COMSY

Parameter: None

Measurement: The count of synchronized commit requests during the specified time interval. Synchronized commit is used by TSO applications, Call Attach Facility, and batch applications.

Data Type: Count

Default Title: SYNC COMMITS

Warning: `DS0150W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

COMRO—Read-Only Commits

Select Code: COMRO

Parameter: None

Measurement: The count of read-only commit requests during the specified time interval. Read-only commit is a one-phase commit used by CICS and IMS in query-only processing.

Data Type: Count

Default Title: READ-ONLY COMMITS

Warning: `DS0640W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

EOMFL—End of Memory Failures

Select Code: EOMFL

Parameter: None

Measurement: A count of the EOM failures encountered during the specified time interval. This counter is incremented when an end of memory request is processed for a DB2-connected address space; for example, at TSO force.

Data Type: Count

Default Title: EOM FAILURES

Warning: `DS0160W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

EOTFL—End of Task Failures

Select Code: EOTFL

Parameter: None

Measurement: A count of the EOT failures encountered during the specified time interval. This counter is incremented when an end of task request is processed for a DB2-connected address space; for example, an abend of an IMS or CICS task having a DB2 thread.

Data Type: Count

Default Title: EOT FAILURES

Warning: `DS0170W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

BINDS—Successful Automatic Binds

Select Code: BINDS

Parameter: None

Measurement: A count of the automatic binds that completed successfully during the specified time interval.

Data Type: Count

Default Title: SUCCESSFUL AUTO BINDS

Warning: `DS0180W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

BINDF—Failed Automatic Binds

Select Code: BINDF

Parameter: None

Measurement: A count of the automatic binds that were attempted but failed during the specified time interval.

Data Type: Count

Default Title: FAILED AUTO BINDS

Warning: `DS0190W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

PLBND—Number of Plans Bound

Select Code: PLBND

Parameter: None

Measurement: Number of plans successfully bound (QTPLNBD).

Data Type: Count

Default Title: PLANS BOUND

Warning: `DS0680W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

PKBND—Number of Packages Bound

Select Code: PKBND

Parameter: None

Measurement: Number of packages successfully bound (QTPKGBD).

Data Type: Count

Default Title: PACKAGES BOUND

Warning: `DS0690W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

BNPKS—Successful Automatic Binds for Packages

Select Code: BNPKS

Parameter: None

Measurement: Number of successful automatic bind requests for packages (QTPKABND).

Data Type: Count

Default Title: AUTO BIND PKG SUCCESSFUL

Warning: `DS0700W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

BNPKF—Failed Automatic Binds for Packages

Select Code: BNPKF

Parameter: None

Measurement: Number of failed automatic bind requests for packages. This is the total automatic bind for package requests less the successful ones (QTAUTOBA).

Data Type: Count

Default Title: AUTO BIND PKG FAILED

Warning: `DS0710W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

SQLAC—SQL Activity

Select Code: SQLAC

Parameter: This can be one of the following parameters statement types:

DDL	Data Definition Language
AUTH	Authorization statements
SEL	SELECT/FETCH statements
LOCK	LOCK statements
UID	Update, Insert, Delete
DYN	Dynamic SQL
CTL	Control statements
OPEN	Open statements
CLOSE	Close statements
CALL	Stored procedure calls
Blank	For all SQL activity

Measurement: The count of the SQL statements, by type or total, executed during the specified time interval (QXSETCRL, QXCALL QXCRGTT, QXRNTAB).

Data Type: Count

Default Title: SQL ACTIVITY

Warning: `DS0200W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

RSQLS—Remote SQL Statements Sent

Select Code: RSQLS

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of SQL statements sent to a remote site to be executed on behalf of a user at this local site (QLSTSQLS).

Data Type: Count

Default Title: REMOTE SQL SENT

Warning: `DS0660W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

RSQLR—Remote SQL Statements Received

Select Code: RSQLR

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of SQL statements received from a remote site to be executed locally on behalf of a remote user (QLSTSQLR).

Data Type: Count

Default Title: REMOTE SQL RECEIVED

Warning: `DS0670W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLG—I/O Parallel Groups Executed

Select Code: PRLG

Parameter: This can be one of the following parameters:

PLANNED	Executed to planned parallel degree.
REDUCED	Executed to degree less than planned.
Blank	For total number of parallel groups executed.

Measurement: The number of parallel groups that executed to the planned parallel degree (QXNORGRP), that executed to a degree less than planned because of a storage shortage or contention on the buffer pool (QXREDGRP), or the total number of parallel groups executed (QXTOTGRP).

Data Type: Count

Default Title: I/O PRLL-GROUPS EXECUTED

Warning: `DS0810W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLF—I/O Parallel Groups with Fallback to Sequential

Select Code: PRLF

Parameter: This can be one of the following parameters:

CURSOR	Fallback to sequential because of ambiguous cursor (can be used for update or delete).
NOSORT	Fallback to sequential because of lack of ESA Sort support.
NOBFR	Fallback to sequential because of storage shortage or buffer pool contention.
NOENCLAV	Fallback to sequential because MVS/ESA enclave services were unavailable.
Blank	Fallback to sequential because of any reason.

Measurement: The number of planned parallel groups that fallback to sequential execution (QXDEGCUR, QXDEGESA, QXDEGBUF, QXDEGENC).

Data Type: Count

Default Title: I/O PRLL-FALLBACK SEQ

Warning: `DS0820W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLSF—Sysplex Parallel Query Failures

Select Code: PRLSF (DB2 Release 5.1 and later)

Parameter: This can be one of the following parameters:

COORNO	Failed because coordinator changed to NO
ISORR	Failed because of ISOLATION RR/RS
CSKIP	Skipped a DB2 because of buffer shortage

Measurement: The number of sysplex query failures (QXCOORNO, QXISORR, QXXCSKIP).

Data Type: Count

Default Title: SYSPLEX PRLL QUERY FAILS

Warning: `DS0830W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

SPROC—Stored Procedures

Select Code: SPROC

Parameter: This can be one of the following parameters:

CALLS	Number of SQL CALL statements that were executed.
ABENDS	Number of times a stored procedure terminated abnormally.
TIMEOUTS	Number of times an SQL CALL statement timed out while waiting to be scheduled.
REJECTS	Number of times an SQL CALL statement was rejected because the procedure was in the ‘STOP ACTION(REJECT)’ state.
FAILURES	Total number of SQL CALL statements that failed (QXCALLAB + QXCALLTO + QXCALLRJ).
Blank	All SQL CALL statements.

Measurement: The number of stored procedure calls, by type or total, for all users when sampled (QXCALL, QXCALLAB, QXCALLTO, QXCALLRJ).

Data Type: Count

Default Title: STORED PROCEDURES

Warning: `DS1400W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

LOBMX—Maximum LOB Storage

Select Code: LOBMX (DB2 Release 6.1 and later)

Parameter: None

Measurement: The maximum storage used for LOB values, in megabytes (QXSTLOBV).

Data Type: Status

Default Title: MAX LOB STORAGE

Warning: `DS1670W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

DROWA—Direct Row Access

Select Code: DROWA (DB2 Release 6.1 and later)

Parameter: This can be one of the following parameters parameters:

USED	Number of times that DB2 used Direct Row Access to locate a record.
FAILIX	Number of times that DB2 attempted to use Direct Row Access but reverted to using an index to locate a record.
FAILTS	Number of times that DB2 attempted to use Direct Row Access but reverted to using a table space scan to locate a record.
FAILURES	Number of Direct Row Access attempts that failed.
Blank	All Direct Row Access attempts.

Measurement: The number of attempts to use Direct Row Access to locate a record (QXROIMAT, QXROIIDX, QXROITS).

Data Type: Count

Default Title: DIRECT ROW ACCESS

Warning: `DS1590W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

TRIGR—Trigger Usage

Select Code: TRIGR (DB2 Release 6.1 and later)

Parameter: This can be one of the following parameters:

STMT	Number of times a statement trigger is activated.
ROW	Number of times a row trigger is activated.
Blank	All activated triggers (QXSTTRG + QXROWTRG).
ERROR	Number of times an SQL error occurred during execution of a triggered action.

Measurement: The number of triggered actions (QXSTTRG, QXROWTRG, QXTRGERR).

Data Type: Count

Default Title: TRIGGER USAGE

Warning: `DS1600W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

NESTM—Maximum Nested SQL Level

Select Code: NESTM (DB2 Release 6.1 and later)

Parameter: None

Measurement: The maximum level of nested SQL cascading due to triggers, user-defined functions, and stored procedures (QXCASCDP).

Data Type: Count

Default Title: MAX NESTED SQL LEVEL

Warning: `DS1610W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

UDF—UDF Usage

Select Code: UDF (DB2 Release 6.1 and later)

Parameter: This can be one of the following parameters:

EXECS	Number of user-defined functions executed.
ABENDS	Number of times a user-defined function terminated abnormally.
TIMEOUTS	Number of times a user-defined function timed out while waiting to be scheduled.
REJECTS	Number of times a user-defined function was rejected.
FAILURES	Number of user-defined functions that failed.
Blank	Total number of user-defined functions.

Measurement: The number user-defined functions (QXCAUD, QXCAUDAB, QXCAUDTO, QXCAUDRJ).

Data Type: Count

Default Title: UDF USAGE

Warning: `DS1620W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 23. Lock Monitors

These services measure locking activity. For example, to activate the USLOK service to track the number of users suspended because of lock conflicts and log a plot of the collected data to the BBI-SS PAS Image log every hour, the service request is

```
SET
REQ=USLOK,LOG=ATPD,I=00:06:00
```

As long as the request is active, an online PLOT is available.

USLOK—Users Suspended for Locks

Select Code: USLOK

Parameter: This can be one of the following parameters:

TSO	TSO
BATCH	Batch
CAF	Call Attach Facility
UTIL	Utility
IMS	IMS
CICS	CICS
DBAT	Database Access (DDF servers)
DIST	Distributed Allied Agent (DDF requestors)
DDF	Both DBAT and DIST
SPAS	Stored Procedures
RRSAF	Recoverable Resource Manager Services Attachment Facility
Blank	For all

Measurement: The number of users suspended because of lock conflicts, by attach type or total, when sampled.

Data Type: Status

Default Title: USERS SUSPENDED FOR LOCK

Warning: `DS0210W (nn) hh:mm:ss title(parm) = v (>thrshld)`

TSLOK—Table Space Locks

Select Code: TSLOK

Parameter: This can be one of the following parameters:

- SHR Shared locks, including SHARE, INTENT SHARE, and SHARE with INTENT EXCLUSIVE
- EXCL Exclusive locks, including UPDATE, INTENT EXCLUSIVE, and EXCLUSIVE
- Blank For all

Measurement: The number of table space locks, by type or total for all users when sampled.

Data Type: Status

Default Title: TABLESPACE LOCK COUNT

Warning: `DS0220W (nn) hh:mm:ss title(parm) = v (>thrshld)`

IXLOK—Index Space Locks

Select Code: IXLOK

Parameter: This can be one of the following parameters:

- SHR Shared locks, including SHARE, INTENT SHARE, and SHARE with INTENT EXCLUSIVE
- EXCL Exclusive locks, including UPDATE, INTENT EXCLUSIVE, and EXCLUSIVE
- Blank For all

Measurement: The number of index space locks, by type or total for all users when sampled.

Data Type: Status

Default Title: INDEX SPACE LOCK COUNT

Warning: `DS0230W (nn) hh:mm:ss title(parm) = v (>thrshld)`

PGLOK—Page Locks

Select Code: PGLOK

Parameter: This can be one of the following parameters:

- SHR — Shared locks, including SHARE, INTENT SHARE, and SHARE with INTENT EXCLUSIVE
- EXCL — Exclusive locks, including UPDATE, INTENT EXCLUSIVE, and EXCLUSIVE
- Blank — For all

Measurement: The total number of page locks, by type or total, for all users when sampled.

Data Type: Status

Default Title: PAGE LOCK COUNT

Warning: `DS0240W (nn) hh:mm:ss title(parm) = v (>thrshld)`

MXLOK—Maximum Page Lock Held by User

Select Code: MXLOK

Parameter: None

Measurement: The maximum number of locks of any kind (page, row, table) held by any single user when sampled.

Data Type: Status

Default Title: MAX PAGE LOCKS

Warning: `DS0250W (nn) hh:mm:ss title(TOTAL) = v (>thrshld) USR = userid`

LDEAD—Lock Deadlock Failures

Select Code: LDEAD

Parameter: None

Measurement: The count of lock deadlock failures during the specified time interval.

Data Type: Count

Default Title: LOCK DEADLOCK FAILURES

Warning: `DS0260W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LTIME—Lock Timeout Failures

Select Code: LTIME

Parameter: None

Measurement: The count of lock timeout failures during the specified time interval.

Data Type: Count

Default Title: LOCK TIMEOUT FAILURES

Warning: `DS0280W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LESCL—Lock Escalations

Select Code: LESCL

Parameter: This can be one of the following parameters:

- SHR — Shared locks, including SHARE, INTENT SHARE, and SHARE with INTENT EXCLUSIVE
- EXCL — Exclusive locks, including UPDATE, INTENT EXCLUSIVE, and EXCLUSIVE
- Blank — For both

Measurement: The count of lock escalations by type or all types during the specified time interval.

Data Type: Count

Default Title: LOCK ESCALATIONS

Warning: `DS0290W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

LSUSP—Suspensions

Select Code: LSUSP

Parameter: This can be one of the following parameters:

LOCK
LATCH
OTHER
Blank for all suspensions

Measurement: The count of lock suspensions during the specified time interval.

Data Type: Count

Default Title: SUSPENSIONS

Warning: `DS0270W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LREQ—Lock Requests

Select Code: LREQ

Parameter: This can be one of the following parameters:

LOCK
UNLOCK
Blank for both

Measurement: The count of lock or unlock requests during the specified time interval.

Data Type: Count

Default Title: LOCK REQUESTS

Warning: `DS0570W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

ILREQ—IRLM Request Counts

Select Code: ILREQ

Parameter: This can be one of the following parameters:

QUERY
CHANGE
OTHER
Blank for all requests to IRLM address spaces

Measurement: The count of requests to IMS resource lock manager address spaces during the specified time interval.

Data Type: Count

Default Title: IRLM REQUEST COUNTS

Warning: `DS0580W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

CLM—Claim Requests

Select Code: CLM

Parameter: None

Measurement: The count of claim requests during the specified time interval (QTXACLNO).

Data Type: Count

Default Title: CLAIM REQUESTS

Warning: `DS0770W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

CLMF—Claim Failures

Select Code: CLMF

Parameter: None

Measurement: The count of unsuccessful claim requests during the specified time interval (QTXACLUN).

Data Type: Count

Default Title: CLAIM FAILURES

Warning: `DS0780W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

DRN—Drain Requests

Select Code: DRN

Parameter: None

Measurement: The count of drain requests during the specified time interval (QTXADRNO).

Data Type: Count

Default Title: DRAIN REQUESTS

Warning: `DS0790W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

DRNF—Drain Failures

Select Code: DRNF

Parameter: None

Measurement: The count of unsuccessful drain requests during the specified time interval (QTXADRUN).

Data Type: Count

Default Title: DRAIN FAILURES

Warning: `DS0800W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

GPLK—Global P-Lock Requests

Select Code: GPLK

Parameter: This can be one of the following parameters:

LOCK	The number of p-lock lock requests.
CHANGE	The number of p-lock change requests.
UNLOCK	The number of p-lock unlock requests.
Blank	All p-lock lock, change, and unlock requests.

Measurement: The number of p-lock lock, change, and unlock requests (QTGSLPLK, QTGSCPLK, QTGSUPLK).

Data Type: Count

Default Title: GLOBAL P-LOCK REQ

Warning: `DS1410W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GXES—Global Lock XES Requests

Select Code: GXES

Parameter: This can be one of the following parameters:

LOCK	The number of p-lock and l-lock lock requests propagated to MVS XES synchronously.
CHANGE	The number of p-lock and l-lock change requests propagated to MVS XES synchronously.
UNLOCK	The number of p-lock and l-lock unlock request resources propagated to MVS XES synchronously.
ASYNC	The number of resources propagated by IRLM to MVS XES asynchronously.
Blank	All p-lock and l-lock lock, change, and unlock requests propagated to MVS XES synchronously.

Measurement: The number of both l-lock and p-lock lock, change, and unlock requests propagated to MVS XES synchronously (QTGSLSLM, QTGSCSLM, QTGSUSLM, QTGSKIDS).

Data Type: Count

Default Title: GLOBAL LOCK XES REQ

Warning: `DS1420W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GSUSP—Global Lock Suspensions

Select Code: GSUSP

Parameter: This can be one of the following parameters:

IRLM	The number of suspends caused by IRLM global resource contention.
XES	The number of suspends caused by MVS XES global resource contention.
FALSE	The number of suspends because of false contentions.
INCOMPAT	The number of global lock or change requests denied because of an incompatible retained lock.
Blank	Suspends or global lock or change requests denied.

Measurement: The number of suspends or global lock or change requests denied (QTGSIGLO, QTGSSGLO, QTGSFLSE, QTGSDRTA).

Data Type: Count

Default Title: GLOBAL LOCK SUSPENDS

Warning: `DS1430W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GNEG—Negotiate P-Lock

Select Code: GNEG

Parameter: This can be one of the following parameters:

PGSET	Number of times this DB2 was driven to negotiate a page set or partition p-lock because of changing inter-DB2 interest levels on the page set or partition.
PAGE	Number of times this DB2 was driven to negotiate a page p-lock because of inter-DB2 p-lock contention.
CHNG	Number of times a p-lock change request was issued during p-lock negotiation.
OTHER	Number of times this DB2 was driven to negotiate another p-lock type (other than page set/partition or page).
Blank	All p-lock negotiations or change requests.

Measurement: The number of times this DB2 was driven to negotiate a p-lock or the number of p-lock change requests (QTGSPPPE, QTGSPGPE, QTGSCHNP, QTGSOTPE).

Data Type: Count

Default Title: NEGOTIATE P-LOCK

Warning: `DS1440W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GNOEN—No Engines—P-Lock

Select Code: GNOEN

Parameter: None

Measurement: The number of times an engine is not available for a p-lock exit or a notify exit request (QTGSPEQW).

Data Type: Count

Default Title: NO ENGINES—P-LOCK

Warning: `DS1450W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GNTFM—Notify Messages

Select Code: GNTFM

Parameter: This can be one of the following parameters:

SENT	The number of notify messages sent.
RECV	The number of notify messages received.
Blank	Both send and receive notify messages.

Measurement: The number of notify messages sent or received (QTGSNTFY, QTGSNTFR).

Data Type: Count

Default Title: NOTIFY MESSAGES

Warning: `DS1480W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 24. EDM Pool Monitors

These services measure the EDM pool. For example, to activate the EDMUT service to track the percentage of EDM pool pages in use and issue a warning message if it is greater than 60%, the service request is

```
SET
REQ=EDMUT,WMSG=WTO,WVAL=60
```

EDMUT—EDM Pool % Utilization

Select Code: EDMUT

Parameter: This can be one of the following parameters:

NOSK	Exclude Skeleton Cursor and Package tables
Blank	For all (including Skeleton Cursor and Package tables)

Measurement: Percentage of EDM pool pages in use when sampled.
(NOSK: QISEPAGE - QISEFREE - QISESKCT - QISESKPT)
(blank: QISEPAGE - QISEFREE)

Data Type: Percent

Default Title: EDM % UTILIZATION

Warning: `DS0300W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

EDMLD—Average EDM Requests per Load I/O

Select Code: EDMLD

Parameter: This can be one of the following parameters:

CT	CT (Cursor Table) loads
PT	PT (Package Table) loads
DBD	DBD loads
Blank	For all

Measurement: The average number of EDM page requests per load I/O in the specified interval.

Data Type: Average

Default Title: AVG EDM REQUESTS/LOAD

Warning: `DS0310W (nn) hh:mm:ss title(parm) = v (>thrshld)`

EDMDS—EDM Data Space Percent Utilization

Select Code:	EDMDS (DB2 Release 6.1 and later)
Parameter:	None
Measurement:	Percentage of Data Space pages used by the EDM pool. (QISEDFRE / QISEDPGE)
Data Type:	Percent
Default Title:	EDM DATA SPACE % UTIL
Warning:	`DS1630W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

Chapter 25. Buffer Pool Monitors

These services measure the buffer pools. For example, to activate the SWS service to track the number of system page updates in buffer pool 0 between 10:30 a.m. and 11:40 a.m., issue a warning message if the count exceeds 100 in a ten minute interval, and log a plot of the collected data to the BBI-SS PAS Image log at 11:40 when processing of the request stops, the service request is

```
SET
REQ=SWS,BP0,WMAX=100,LOG=ATWARN,ATSTOP,START=10:30:00,HOLD=YES
```

The maximum number of characters that can be entered in the parameter line is 55. HOLD= YES holds the request until another request is entered with the same reqid as follows:

```
SET
REQ=SWS,BP0,STOP=11:40:00,I=00:10:00
```

which activates the request. Or, the complete request can be specified in a member of the BBI-SS PAS BBPARM data set then activated with the SET BLK keyword, as described in "Grouping Requests" on page 70.

BPUTL—Buffer Pool Percent Utilization

Select Code: BPUTL

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Actual buffer pool utilization measuring all unavailable pages, whether in use or updated. In percent, when sampled, for the specified buffer pool or all active pools.

Note: Unavailable pages are sometimes referred to as nonstealable pages. This includes pages currently in use by a thread and those updated but not yet written to disk.

Data Type: Percent

Default Title: BFR POOL % UTILIZATION

Warning: `DS0320W (nn) hh:mm:ss title(parm) = v (>thrshld)`

BPUSE—Buffer Pool Percent in Use

Select Code: BPUSE

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The percentage of buffer pool pages marked *in use* by a thread when sampled, for the specified buffer pool or all active pools.

Data Type: Percent

Default Title: BFR POOL % IN USE

Warning: `DS0330W (nn) hh:mm:ss title(parm) = v (>thrshld)`

RWP—Reads with Paging

Select Code: RWP

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of reads with paging during the specified time interval. This is the number of times a buffer being PAGEFIXed to perform read I/O did not have real storage frame backing.

Data Type: Count

Default Title: READS WITH PAGING

Warning: `DS0340W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

WWP—Writes with Paging

Select Code: WWP

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of writes with paging during the specified time interval. This is the number of times a buffer being PAGEFIXed to perform write I/O did not have real storage frame backing.

Data Type: Count

Default Title: WRITES WITH PAGING

Warning: `DS0350W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GETPG—GETPAGE Requests

Select Code: GETPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of GETPAGE requests during the specified time interval.

Data Type: Count

Default Title: GETPAGE REQUESTS

Warning: `DS0360W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

RIO—Read I/O Activity

Select Code: RIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of actual read I/O requests during the specified time interval. These are media manager read requests, either for a GETPAGE request or a multiple page request by the prefetch function.

Data Type: Count

Default Title: RIO-READ I/O

Warning: `DS0370W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

SWS—System Page Updates

Select Code: SWS

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of system page updates (SWS) during the specified time interval. This counter is incremented by one each time a row in a database system page is updated.

Data Type: Count

Default Title: SWS-SYSTEM PAGE UPDATES

Warning: `DS0380W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

WIO—Write I/O Activity

Select Code: WIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of actual write I/O requests during the specified time interval. These media manager requests can batch-write I/O so that multiple pages are written per single call to the media manager.

Data Type: Count

Default Title: WIO-WRITE I/O

Warning: `DS0390W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PWS—System Pages Written

Select Code: PWS

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of database system pages written during the specified time interval.

Data Type: Count

Default Title: PWS-SYSTEM PAGES WRITTEN

Warning: `DS0400W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GETRI—GETPAGE (GET) Requests per Read I/O (RIO)

Select Code: GETRI

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The average number of GETPAGE requests per read I/O during the specified time interval.

Data Type: Average

Default Title: GETPAGES PER READ I/O

Warning: `DS0410W (nn) hh:mm:ss title(parm) = v (>thrshld)`

Note: A warning threshold for this service should be set as a minimum, since a larger number is an improvement rather than a degradation (WVAL=<n).

SWSPW—System Page Updates (SWS) per System Pages Written (PWS)

Select Code: SWSPW

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The average system page updates (SWS) per system pages written (PWS) during the specified time interval.

Data Type: Average

Default Title: UPDATES PER PAGE WRITTEN

Warning: `DS0420W (nn) hh:mm:ss title(parm) = v (>thrshld)`

Note: A warning threshold for this service should be set as a minimum, since a larger number is an improvement rather than a degradation (WVAL=<n).

PWSWI—System Pages Written (PWS) per Write I/O (WIO)

Select Code: PWSWI

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The average system pages written (PWS) per write I/O (WIO) for the specified time interval.

Data Type: Average

Default Title: PAGES WRITTEN/ WRITE I/O

Warning: `DS0430W (nn) hh:mm:ss title(parm) = v (>thrshld)`

MIGDS—Migrated Data Sets

Select Code: MIGDS

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of migrated data sets during the specified time interval.

Data Type: Count

Default Title: MIGRATED DATA SETS

Warning: `DS0590W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

RTO—Recall Time-Outs

Select Code: RTO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of HSM recall timeouts during the specified time interval.

Data Type: Count

Default Title: RECALL TIME-OUTS

Warning: `DS0600W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PIO—Prefetch Read I/O

Select Code: PIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of prefetch read I/O during the specified time interval.

Data Type: Count

Default Title: PREFETCH READ I/O

Warning: `DS0610W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

RIDUT—RID Pool Percent Utilization

Select Code: RIDUT

Parameter: None

Measurement: The percent of RID pool blocks currently in use. It is computed as the number of RID blocks currently used divided by the total number of RID blocks.

Data Type: Percent

Default Title: RID POOL % UTILIZATION

Warning: `DS0620W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

MIAPF—Multi-Index Failures

Select Code: MIAPF

Parameter: This can be one of the following parameters failure types:

#RIDS	Failures for exceeded RID threshold
STOR	Failures for exceeded storage limits
Blank	Both failure types

Measurement: A count of the RID list processing failures during the specified time interval. This shows SQL activity that EXPLAIN indicates will use multi-index access path, but that fail to do so at run time.

Data Type: Count

Default Title: MULTI-INDEX FAILURES

Warning: `DS0630W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LSTPF—Number of List Prefetch Requests

Select Code: LSTPF

Parameter: Buffer pool ID. If blank, all buffer pools.

Measurement: The number of list prefetch requests (QBSTLPF).

Data Type: Count

Default Title: LIST PREFETCH REQ

Warning: `DS0720W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DESRD—Number of Pages for Which Destructive Read Requested

Select Code: DESRD

Parameter: Buffer pool ID. If blank, all buffer pools.

Measurement: The number of pages for which destructive read was requested (QBSTWDRP).

Data Type: Count

Default Title: DESTRUCTIVE READ

Warning: `DS0730W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DWTX—Vertical Deferred Write Threshold Reached

Select Code: DWTX

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of times the vertical deferred write threshold was reached. When the number of updated pages for a given data set exceeds the Vertical Deferred Write threshold, deferred writes are initiated for that data set (QBSTDWV).

Data Type: Count

Default Title: VERT-DEF-WRITE-THRESHOLD

Warning: `DS0840W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFTRQ—Total Prefetch Requests

Select Code: PFTRQ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of total prefetch requests during the specified time interval (QBSTSEQ + QBSTLPF + QBSTDPF).

Data Type: Count

Default Title: TOTAL PREFETCH REQUESTS

Warning: `DS0850W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFTIO—Total Prefetch Read I/O

Select Code: PFTIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of total asynchronous read I/Os because of prefetch during the specified time interval (QBSTPIO + QBSTLIO + QBSTDIO).

Data Type: Count

Default Title: TOTAL PREFETCH I/O

Warning: `DS0860W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFTPG—Total Prefetch Pages Read

Select Code: PFTPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of total pages read asynchronously because of prefetch during the specified time interval (QBSTSPP + QBSTLPP + QBSTDPP).

Data Type: Count

Default Title: TOTAL PREFETCH PGS READ

Warning: `DS0870W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFSRQ—Sequential Prefetch Requests

Select Code: PFSRQ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of sequential prefetch requests during the specified time interval (QBSTSEQ).

Data Type: Count

Default Title: SEQ PREFETCH REQUESTS

Warning: `DS0880W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFSIO—Sequential Prefetch Read I/O

Select Code: PFSIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of asynchronous read I/Os because of sequential prefetch during the specified time interval (QBSTPIO).

Data Type: Count

Default Title: SEQ PREFETCH I/O

Warning: `DS0890W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFSPG—Sequential Prefetch Pages Read

Select Code: PFSPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of pages read asynchronously because of sequential prefetch during the specified time interval (QBSTSPP).

Data Type: Count

Default Title: SEQ PREFETCH PGS READ

Warning: `DS0900W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFLRQ—List Prefetch Requests

Select Code: PFLRQ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of list prefetch requests during the specified time interval (QBSTLPF).

Data Type: Count

Default Title: LIST PREFETCH REQUESTS

Warning: `DS0910W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFLIO—List Prefetch Read I/O

Select Code: PFLIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of asynchronous read I/Os because of list prefetch during the specified time interval (QBSTLIO).

Data Type: Count

Default Title: LIST PREFETCH I/O

Warning: `DS0920W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFLPG—List Prefetch Pages Read

Select Code: PFLPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of pages read asynchronously because of list prefetch during the specified time interval (QBSTLPP).

Data Type: Count

Default Title: LIST PREFETCH PGS READ

Warning: `DS0930W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFDRQ—Dynamic Prefetch Requests

Select Code: PFDRQ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: Count of dynamic prefetch requests during the specified time interval (QBSTDPF).

Data Type: Count

Default Title: DYN PREFETCH REQUESTS

Warning: `DS0940W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFDIO—Dynamic Prefetch Read I/O

Select Code: PFDIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of asynchronous read I/Os because of dynamic prefetch during the specified time interval (QBSTDIO).

Data Type: Count

Default Title: DYN PREFETCH I/O

Warning: `DS0950W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFDPG—Dynamic Prefetch Pages Read

Select Code: PFDPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of pages read asynchronously because of dynamic prefetch during the specified time interval (QBSTDPP).

Data Type: Count

Default Title: DYN PREFETCH PGS READ

Warning: `DS0960W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PFIOF—Prefetch I/O Failures

Select Code: PFIOF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of times a requested prefetch I/O stream was denied because of a storage shortage in the buffer pool during the specified time interval (QBSTJIS).

Data Type: Count

Default Title: PREFETCH I/O FAILURES

Warning: `DS0970W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLQ—Parallel Query Requests

Select Code: PRLQ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of requests made for processing queries in parallel in the buffer pool during the specified time interval (QBSTPQO).

Data Type: Count

Default Title: PARALLEL QUERY REQUESTS

Warning: `DS0980W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLQF—Parallel Query Request Failures

Select Code: PRLQF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of times that DB2 could not allocate the requested number of buffer pages to allow a parallel group to run to the planned degree during the specified time interval (QBSTPQF).

Data Type: Count

Default Title: PARALLEL QUERY REQ FAILS

Warning: `DS0990W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRLGF—Conditional GETPAGE Failures

Select Code: PRLGF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of times a conditional GETPAGE request could not be satisfied for this buffer pool during the specified time interval (QBSTNGT).

Data Type: Count

Default Title: CONDITIONAL GETPAGE FAIL

Warning: `DS1000W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRL12—Prefetch Reduced to 1/2

Select Code: PRL12

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of occurrences when the prefetch quantity was reduced from normal to one-half of normal during the specified time interval (QBSTPL1).

Data Type: Count

Default Title: PREFETCH REDUCED TO 1/2

Warning: `DS1010W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

PRL14—Prefetch Reduced to 1/4

Select Code: PRL14

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of occurrences when the prefetch quantity was reduced from one-half of normal to one-quarter of normal during the specified time interval (QBSTPL2).

Data Type: Count

Default Title: PREFETCH REDUCED TO 1/4

Warning: `DS1020W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

HPVPS—Successful Synchronous Reads for HP-to-VP

Select Code: HPVPS

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of successful synchronous requests to move a page from a hiperpool to a virtual buffer pool during the specified time interval (QBSTHRE).

Data Type: Count

Default Title: SYNC HP READS

Warning: `DS1060W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

HPVPA—Successful Asynchronous Reads for HP-to-VP

Select Code: HPVPA

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of pages moved successfully from the hiperpool to the virtual buffer pool asynchronously during the specified time interval (QBSTHRA + QBSTARA).

Data Type: Count

Default Title: ASYNC HP READS

Warning: `DS1070W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

MAXPF—Maximum Concurrent Parallel I/O Prefetch Streams

Select Code: MAXPF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The highest number of concurrent prefetch I/O streams allocated for supporting queries processed in parallel during the specified time interval (QBSTXIS).

Data Type: Count

Default Title: MAX CONCURRENT PRLL PF

Warning: `DS1080W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

HPWRF—Write Page Failures

Select Code: HPWRF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of pages for which a write request failed because the backing expanded store was stolen or some other error occurred during the specified time interval (QBSTHWF + QBSTAWF).

Data Type: Count

Default Title: HP WRITE FAILURES

Warning: `DS1090W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

HPRDF—Read Pages Failures

Select Code: HPRDF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The count of pages for which a read request failed because the backing expanded store was stolen (castout=yes) or some other error occurred during the specified time interval (QBSTHRF + QBSTARF).

Data Type: Count

Default Title: HP READ FAILURES

Warning: `DS1100W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

SEQPG—Sequential GETPAGE Requests

Select Code: SEQPG

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of GETPAGE requests issued by sequential access requesters during the specified time interval (QBSTSGT).

Data Type: Count

Default Title: SEQUENTIAL GETPAGE REQS

Warning: `DS1110W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

SEQIO—Sequential Read I/O Requests

Select Code: SEQIO

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of synchronous read I/Os issued by sequential access requesters during the specified time interval (QBSTSIO). This occurs when prefetch is disabled or when the requested pages are not consecutive.

Data Type: Count

Default Title: SEQUENTIAL READ I/O REQS

Warning: `DS1120W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

WKPFZ—Workfile Prefetch Quantity Is Zero

Select Code: WKPFZ

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of times sequential prefetch is not scheduled for a work file because the dynamic prefetch quantity is zero during the specified time interval (QBSTWKPD).

Data Type: Count

Default Title: WK FILE DYN PF QTY=0

Warning: `DS1130W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

WKNBF—Workfile Not Created—No Buffers

Select Code: WKNBF

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of work files that cannot be created because of insufficient buffer resources during the specified time interval (QBSTMAX).

Data Type: Count

Default Title: WK FILE-NO BFRS

Warning: `DS1140W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

WKMAX—Max Workfiles Used Concurrently

Select Code: WKMAX

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The maximum number of work files used concurrently during merge processing during the specified time interval (QBSTWFM).

Data Type: Count

Default Title: WK FILE-MAX CONCURRENT

Warning: `DS1140W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GRDRQ—GBP Read Requests with Data

Select Code: GRDRQ (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of coupling facility read requests with data returned (QBGLXD, QBGLMD, QBGLAD).

Data Type: Count

Default Title: GBP READ REQ WITH DATA

Warning: `DS1500W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GPGWR—GBP Pages Written

Select Code: GPGWR (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of changed or clean pages written to the group buffer pool (QBGLSW, QBGLWC, QBGLAW, QBGLAC).

Data Type: Count

Default Title: GBP PAGES WRITTEN

Warning: `DS1510W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GCAST—GBP Castout Requests

Select Code: GCAST (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of times group buffer pool castout was initiated because the class castout threshold was detected or the group buffer pool castout threshold was detected (QBGLCT, QBGLGT).

Data Type: Count

Default Title: GBP CASTOUT REQS

Warning: `DS1520W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GCTPG—GBP Castout Pages

Select Code: GCTPG (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of pages cast out from the group buffer pool to DASD (QBGLRC).

Data Type: Count

Default Title: GBP CASTOUT PAGES

Warning: `DS1530W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GRDIN—GBP Read Requests—Interest

Select Code: GRDIN (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of coupling facility read requests caused by the buffer being marked invalid or the requested page was not found in the buffer pool. Data is not returned from the group buffer pool and a directory entry is created if it does not already exist. This means another DB2 in the group has R/W interest in the page set or partition (QBGLXR, QBGLMR, QBGLAR).

Data Type: Count

Default Title: GBP READ REQ-INTEREST

Warning: `DS1540W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GRDNO—GBP Read Requests—No Interest

Select Code: GRDNO (DB2 Release 4.1 only)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of coupling facility read requests caused by the buffer being marked invalid or the requested page was not found in the buffer pool. Data is not returned from the group buffer pool and no directory entry is created for this page. This means no other DB2 in the group has R/W interest in the page set or partition (QBGLXN, QBGLMN, QBGLAN).

(DB2 Version 4 only)

Data Type: Count

Default Title: GBP READ REQ-NO INTEREST

Warning: `DS1550W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GFAIL—GBP Failures

Select Code: GFAIL (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of times a castout engine was not available, a coupling facility write engine was not available for coupling facility writes, or coupling facility read or write requests could not complete because of a lack of coupling facility storage resources (QBGLCN, QBGLSU, QBGLRF, QBGLWF).

Data Type: Count

Default Title: GBP FAILURES

Warning: `DS1560W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

GOTHR—GBP Other Requests

Select Code: GOTHR (DB2 Release 4.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9 (DB2 6.1 and later)
BP16K—BP16K9 (DB2 6.1 and later)
BP32K—BP32K9
Blank for all active pools

Measurement: The number of other coupling facility requests that are not counted in any of the other QBGL fields. (DB2 4.1 - QBGLOS)
(DB2 5.1 and later - QBGLOS, QBGLCK, QBGLRB, QBGLUN, QBGLCC, QBGLCS, QBGLDN, QBGLRD, QBGLDG)

Data Type: Count

Default Title: GBP OTHER REQUESTS

Warning: `DS1570W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

G2WRF—GBP Coupling Facility Write Fail Secondary

Select Code: G2WRF (DB2 Release 6.1 and later)

Parameter: This can be one of the following parameters:

BP0—BP49
BP8K—BP8K9
BP16K—BP16K9
BP32K—BP32K9
Blank for all active pools

Measurement: The number of coupling facility requests to write changed pages to the secondary group buffer pool for duplexing that failed due to a lack of storage in the coupling facility. (QBGL2F)

Data Type: Count

Default Title: GBP CF WRITE FAIL 2NDRY

Warning: `DS1640W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 26. Log Monitors

These services measure logging activity. For example, to activate the LOGWT service to track the number of times log requests wait due to unavailable log buffers and log a plot of the collected data to the BBI-SS PAS Image log at the end of ten 30-second intervals or every 5 minutes and issue a warning message if the number of log buffer waits exceeds 4, the service request is

```
SET
REQ=LOGWT,I=00:00:30,LOG=ATPD,WMAX=4
```

ARCWA—Archive Log Write Allocations

Select Code: ARCWA

Parameter: None

Measurement: The number of times an archive log was allocated to archive an active log data set during the specified time interval.

Data Type: Count

Default Title: ARCHIVE LOG WRITE ALLOCS

Warning: `DS0440W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

ARCRA—Archive Log Read Allocations

Select Code: ARCRA

Parameter: None

Measurement: The number of times an archive log was allocated for read, during the specified time interval. This is only done when backout or recovery data requests could not be satisfied from the log buffers or from the active log.

Data Type: Count

Default Title: ARCHIVE LOG READ ALLOCS

Warning: `DS0450W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

ARCWR—Archive Log CIs Written

Select Code: ARCWR

Parameter: None

Measurement: The number of control intervals (CIs) archived during the specified time interval.

Data Type: Count

Default Title: ARCHIVE LOG CI WRITES

Warning: `DS0460W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LOGWT—Log Buffer Waits

Select Code: LOGWT

Parameter: None

Measurement: The number of times log requests waited due to unavailable log buffers.

Data Type: Count

Default Title: LOG BUFFER WAITS

Warning: `DS0470W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

LOGWR—Log Write Requests

Select Code: LOGWR

Parameter: This can be one of the following parameters:

FORCE
NOWAIT
Blank for all log write requests

Measurement: The number of log write requests, by type or total, during the specified time interval.

Data Type: Count

Default Title: LOG WRITE REQUESTS

Warning: `DS0480W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

LOGUT—Active Log Percent Utilization

Select Code: LOGUT

Parameter: This can be one of the following parameters:

CURRENT	For the percentage of active log CIs in the current log data set.
Blank	For the percentage of active log CIs in all active log data sets.

Measurement: The percentage of active log CIs in use of total log CIs available. If the CURRENT parameter is specified, the calculation is limited to the current log data set. Otherwise, the total log CIs are defined by the number of active log data sets times their size, divided by 4K (log buffer and CI size). If dual logging is in effect for the active log, this reflects the utilization of the active log data sets for the first copy (COPY1).

The data sets not currently being written to are considered in use if awaiting archive, and otherwise free. The actual utilization of the current data set being written to is calculated and incorporated into the total utilization percent. For example, if there are four data sets of equal size and two are free, one is awaiting archive, and the current one in use is 60% full, the LOGUT value returned is 40%.

Data Type: Percent

Default Title: ACTIVE LOG % UTILIZATION

Warning: `DS0490W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

LOGRD—Log Reads for Backout/Recovery

Select Code: LOGRD

Parameter: This can be one of the following parameters:

BUFFER
ACTIVE
ARCHIVE
Blank for all log read requests

Measurement: The number of log reads for backout or recovery, satisfied from the active log buffers, from active log data sets, from archive logs, or from all sources, during the specified time interval.

Data Type: Count

Default Title: LOG READS FOR BACKOUT

Warning: `DS0500W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

BSDSA—BSDS Access Requests

Select Code: BSDSA

Parameter: None

Measurement: The number of accesses to the Bootstrap Data Set (BSDS) during the specified time interval.

Data Type: Count

Default Title: BSDS ACCESSES

Warning: `DS0510W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

CHKPT—Number of Checkpoints

Select Code: CHKPT

Parameter: None

Measurement: The number of DB2 checkpoints taken during the specified time interval.

Data Type: Count

Default Title: NUMBER OF CHECKPOINTS

Warning: `DS0520W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

CKPFR—Checkpoint Frequency

Select Code: CKPFR

Parameter: None

Measurement: The number of DB2 checkpoints taken during the specified time interval. The purpose of this monitor is to report that fewer than the specified number of checkpoints have occurred in the specified time interval. Suggested values to start this monitor are

- An interval of 20 minutes
- A value of less than 1

For example: `INTERVAL=20:00 WVAL=<1`

In this example, the message will be issued if no checkpoints occur in a twenty minute interval.

Data Type: Count

Default Title: CHECKPOINT FREQUENCY

Warning: `DS1580W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

ARCTC—Tape Volume Contention Read Delays

Select Code: ARCTC

Parameter: None

Measurement: The number of read accesses delayed because of tape volume contention during the specified time interval (QJSTTVC).

Data Type: Count

Default Title: ARC TAPE VOL CONTENTION

Warning: `DS1030W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

ARCDL—Read Accesses Delayed

Select Code: ARCDL

Parameter: None

Measurement: The number of read accesses delayed because of unavailable resources during the specified time interval (QJSTWUR).

Data Type: Count

Default Title: ARC READ ACCESS DELAYED

Warning: `DS1040W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

ARCTM—Look-Ahead Tape Mounts

Select Code: ARCTM

Parameter: This can be one of the following parameters:

FAIL	For number of unsuccessful look-ahead tape mounts.
SUCCESS	For number of successful look-ahead tape mounts.
Blank	For total number of look-ahead tape mounts attempted.

Measurement: The number of look-ahead tape mount requests attempted, successful, or failed during the specified time interval (QJSTLAMA, QJSTLAMS).

Data Type: Count

Default Title: ARC LK-AHEAD TAPE MOUNTS

Warning: `DS1050W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 27. MVS Services

These services measure MVS activities which may affect DB2 performance. For example, to activate the CSAPG service to track total paging in the common storage area for 10 sampling intervals and log a plot of the collected data to the BBI-SS PAS Image log when processing of the request completes, the service request is

```
SET
REQ=CSAPG,LOG=ATSTOP,STOPCNT=10
```

DB2DP—Demand Paging

Select code: DB2DP

Parameter: This can be one of the following parameters:

IRLM	IMS Resource Lock Manager address space
SSAS	DB2 System Services address space (started task xxxxMSTR, where xxxx is the DB2 subsystem ID)
DBAS	DB2 Database Services address space (started task xxxxDBM1, where xxxx is the DB2 subsystem ID)
SPAS	DB2 Stored Procedure address space (started task xxxxSPAS, where xxxx is the DB2 subsystem ID)
DB2	The four service address spaces defined above plus the DDF address space if present
DDF	DDF address space (started task xxxxDIST, where xxxx is the DB2 subsystem ID)
Blank	For total MVS system

Measurement: Total page-ins in the specified interval: total MVS system, or by specified address space (includes reclaims).

Data type: Count

Default Title DEMAND PAGING

Warning: `DS0530W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

CSAPG—CSA Paging

Select code: CSAPG

Parameter: None

Measurement: Total paging in the common storage area (CSA).

Data type: Count

Default Title CSA PAGING

Warning: `DS0540W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

CSAP—CSA Percentage of Utilization

Select code: CSAP

Parameter: None

Measurement: CSA percent utilization at time of sample =
`100 * ((Total CSA)–(Space described by FBQEs in CSA)) / Total CSA`

Data type: Percent

Default Title: CSA % UTILIZATION

Warning: `DS0550W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

ECSAP—Extended CSA Percentage of Utilization

Select code: ECSAP

Parameter: None

Measurement: Extended CSA percent utilization at time of sample =
`100 * ((Total ECSA)–(Space described by FBQEs in ECSA))/ Total ECSA`

Data type: Percent

Default Title: ECSA % UTILIZATION

Warning: `DS0560W (nn) hh:mm:ss title(TOTAL) = v (>thrshld)`

Chapter 28. DDF Monitors

These services measure activity in the DB2 Distributed Data Facility address space. For example, to measure the number of bytes sent from the target location to the CHICAGO location, the service request is

```
SET
REQ=DDFBS,CHICAGO
```

DDFBS—DDF Bytes Sent

Select code: DDFBS

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: Total bytes sent from this location (monitor target) to all remote locations or to the specified location(s).

Data type: Count

Default Title DDF BYTES SENT

Warning: `DS0740W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DDFBR—DDF Bytes Received

Select code: DDFBR

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: Total bytes received at this location (monitor target) from all remote locations or from the specified location(s).

Data type: Count

Default Title DDF BYTES RECEIVED

Warning: `DS0750W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DDFCQ—DDF Conversations Queued

Select code: DDFCQ

Parameter: VTAM LU name. If blank, all LUs are monitored.

A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of conversations queued because the session limit has been reached for all LUs or for the specified LU(s).

Data type: Status

Default Title: DDF CONVS QUEUED

Warning: `DS0760W (nn) hh:mm:ss title(parm) = v (>thrshld)`

CNVLM—Conversations Deallocated—ZPARM Limit

Select Code: CNVLM

Parameter: None

Measurement: The number of conversations deallocated because the ZPARM limit was reached for the maximum concurrent threads (active + inactive) during the specified time interval (QDSTQCRT).

Data Type: Count

Default Title: CONV DEALLOC ZPARM LIMIT

Warning: `DS1160W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

NACTC—Current Inactive DB Threads

Select Code: NACTC

Parameter: This can be one of the following parameters:

TYPE1	Number of type 1 inactive database access threads.
TYPE2	Number of type 2 inactive database access threads (DB2 6.1 and later).
Blank	All inactive database access threads.

Measurement: The number of inactive database access threads during the specified time interval (QDSTQCIT, QDSTCIN2).

Data Type: Status

Default Title: CURRENT INACT DB THRDS

Warning: `DS1170W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2CON—2-Phase Connections

Select Code: P2CON

Parameter: This can be one of the following parameters:

COLD	For number of cold start connections.
WARM	For number of warm start connections.
Blank	For total number of connections with two-phase commit operations.

Measurement: The total number of connections with two-phase commit operations (QDSTCSTR + QDSTWSTR), cold started connections (QDSTCSTR), or warm started connections (QDSTWSTR) during the specified time interval.

Data Type: Count

Default Title: 2-PHASE CONNECTIONS

Warning: `DS1180W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2RSY—2-Phase Resync Connections

Select Code: P2RSY

Parameter: This can be one of the following parameters:

FAIL	For number of unsuccessful resynchronization connection attempts.
SUCCESS	For number of successful resynchronization connections.
Blank	For total number of resynchronization connection attempts.

Measurement: The total number (QDSTRSAT) of resynchronization connections attempted with all remote locations for two-phase commit operations only, number of successful attempts (QDSTRSSU), or number of unsuccessful attempts (QDSTRSAT - QDSTRSSU) during the specified time interval.

Data Type: Count

Default Title: 2-PHASE RESYNC CONNECTS

Warning: `DS1200W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2RMT—Remote Location Coordinator Total Operations

Select Code: P2RMT

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of operations that have the remote location as the coordinator or for all remote locations during the specified time interval (QLSTINDT + QLSTCPTR + QLSTRBTR).

Data Type: Count

Default Title: REMOTE COORDNTR TOTAL

Warning: `DS1230W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2RMI—Remote Location Coordinator INDOUBTS

Select Code: P2RMI

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of threads that became INDOUBT that have the remote location as the coordinator or for all remote locations during the specified time interval (QLSTINDT).

Data Type: Count

Default Title: REMOTE COORDNTR INDOUBTS

Warning: `DS1240W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2RMC—Remote Location Coordinator COMMITS

Select Code: P2RMC

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of COMMIT operations that have the specified location as the coordinator or for all remote locations during the specified time interval (QLSTCPTR).

Data Type: Count

Default Title: REMOTE COORDNTR COMMITS

Warning: `DS1250W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

P2RMR—Remote Location Coordinator ROLLBACKs

Select Code: P2RMR

Parameter: Location name. If blank, all locations are monitored.

Only the first eight characters can be specified. A plus sign (+) can be used for qualified name masking (see the *Using MAINVIEW* manual).

Measurement: The number of ROLLBACK operations that have the specified location as the coordinator or for all remote locations during the specified time interval (QLSTRBTR).

Data Type: Count

Default Title: REMOTE COORDNTR ROLLBKS

Warning: `DS1260W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

DDFT1—Connections Terminated—Maximum Type 1

Select Code: DDFT1 (DB2 Release 6.1 and later)

Parameter: None

Measurement: The number of connections that were terminated instead of made type 1 inactive because the maximum number of type 1 inactive threads was reached during the specified time interval (QDSTNITC).

Data Type: Count

Default Title: CONNECT TERM-MAX TYPE1

Warning: `DS1650W (nn) hh:mm:ss title(TOTAL) = v IN x intrvl (>thrshld)`

DBATQ—DBATs Queued—MAXDBAT Reached

Select Code: DBATQ (DB2 Release 5.1 and later)

Parameter: This can be one of the following parameters:

NEW Number of times that a new Database Access Thread (DBAT) was queued because it reached the ZPARM maximum for active remote threads (QDSTQDBT).

Blank Number of times that a new or reactivated type 2 DBAT was queued because it reached the ZPARM maximum for active remote threads.

For DB2 Release 5.1, this value is the same as for the NEW parameter (QDSTQDBT).

For DB2 Release 6.1 and later, this value indicates the number of queued receive requests for a type 2 inactive thread, plus the number of queued requests for new connections. These requests were received after the maximum number of remote active threads was reached (ZPARM MAXDBAT) (QDSTQIN2).

Measurement: The number of DBATs queued because the MAXDBAT limit was reached (QDSTQDBT, QDSTQIN2).

Data Type: Count

Default Title: DBATS QUEUED-MAXDBAT

Warning: `DS1660W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 29. SQL Monitors

These services measure the number and type of SQL calls made. For example, to activate the #DYN service every 30 seconds to measure the number of dynamic SQL statements (PREPAREs) issued and to log a plot of the collected data to the BBI-SS PAS Image log every 5 minutes, the service request is

```
SET
REQ=#DYN,I=00:00:30,LOG=ATPD
```

#SQLD—DDL Statements

Select Code: #SQLD

Parameter: User-defined identifier for the request or blank.

Measurement: Number of Data Definition Language statements (CREATE, ALTER, DROP) (QXCRTAB + QXCRINX + QXCTABS + QXCRSYN + QXCRDAB + QXCRSTG + QXDEFVU + QXDRPIX + QXDRPTA + QXDRPTS + QXDRPDB + QXDRPSY + QXDRPST + QXDRPVU + QXALTST + QXFETCH + QXALTTS + QXALTTA + QXALTIX + QXDRPAL + QXCRALS + QXALDAB + QXDRPPKG + QXCRGTT + QXRNTAB).

Data Type: Count

Default Title: DDL SQL STATEMENTS

Warning: `DW0020W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#SQLM—Data Manipulative SQL Statements

Select Code: #SQLM

Parameter: User-defined identifier for the request or blank.

Measurement: Number of data manipulative SQL statements issued by a transaction (SELECT, INSERT, UPDATE, DELETE, PREPARE, OPEN, CLOSE, FETCH) (QXSELECT + QXFETCH + QXINSRT + QXDELET + QXUPDTE + QXOPEN + QXCLOSE + QXPREP).

Data Type: Count

Default Title: DATA MANIPULATIVE STMTS

Warning: `DW0200W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#SQLA—Administrative SQL Statements

Select Code: #SQLA

Parameter: User-defined identifier for the request or blank.

Measurement: Number of SQL administrative statements issued by a transaction. This includes:

- LOCK TABLE
- COMMENT
- LABEL
- GRANT
- REVOKE
- SET CURRENT SQL ID
- SET CONNECTION
- SET CURRENT DEGREE
- CONNECT
- RELEASE
- SET CURRENT RULES

(QXCMTON + QXLOCK + QXGRANT + QXREVOK + QXLABON + QXSETSQL + QXCON1 + QXCON2 + QXREL + QXSETCON + QXSETCDG + QXSETCRL + QXALOCL + QXALOCC)

Data Type: Count

Default Title: ADMINISTRATIVE STMTS

Warning: `DW0210W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#SQLC—SQL Statements per Commit

Select Code: #SQLC

Parameter: User-defined identifier for the request or blank.

Measurement: Number of SQL statements per commit point (SELECT, FETCH, INSERT, DELETE, UPDATE) (QXSELECT + QXFETCH + QXINSRT + QXDELET + QXUPDTE).

Data Type: Count

Default Title: SQL STMTS PER COMMIT

Warning: `DW0220W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#DYN—Dynamic SQL Statements

Select Code: #DYN

Parameter: User-defined identifier for the request or blank.

Measurement: Number of dynamic SQL statements (PREPARE) (QXPREP).

Data Type: Count

Default Title: DYNAMIC SQL STATEMENTS

Warning: `DW0030W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#CALL—SQL Call Statements

Select Code: #CALL

Parameter: User-defined identifier for the request or blank.

Measurement: Number of stored procedure calls (QXCALL).

Data Type: Count

Default Title: SQL CALL STATEMENTS

Warning: `DW0400W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#SPRC—Stored Procedures Executed

Select Code: #SPRC

Parameter: User-defined identifier for the request or blank.

Measurement: Number of stored procedures executed (QXCALL, QXCALLAB, QXCALLTO, QXCALLRJ).

Data Type: Count

Default Title: SPROCS EXECUTED

Warning: `DW0410W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#REOP—Reoptimizations

Select Code:	#REOP (DB2 Release 5.1 and later)
Parameter:	User-defined identifier for the request or blank.
Measurement:	Number of times that reoptimization for host variables occurred (QXSTREOP).
Data Type:	Count
Default Title:	REOPTIMIZATIONS
Warning:	`DW0600W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 30. Buffer Usage Monitors

These services measure the amount of buffer usage activity. For example, to activate the #GETP service at the default interval specified in BBPARM member BBIISP00 to measure the number of buffer pool GETPAGE requests for DB2 plan names starting with AA or AB, issue a warning message (10 maximum) to the system console if the number of requests is greater than 500, and log a plot of the collected data to the BBI-SS PAS Image log when the warning is generated, the service request is:

```
SET
REQ=#GETP,WMAX=500,WLIM=10,LOG=ATWARN,DB2PLAN=AA+,AB+
```

#GETP—GETPAGE Requests

Select code: #GETP

Parameter: User-defined identifier for the request or blank.

Measurement: Number of GETPAGE requests in the buffer pools (QBACGET).

Data Type: Count

Default Title: GETPAGE REQUESTS

Warning: `DW0040W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#UPDP—Update Page Requests

Select Code: #UPDP

Parameter: User-defined identifier for the request or blank.

Measurement: Number of update page requests in the buffer pool (QBACSWS + QBACSWU).

Data Type: Count

Default Title: UPDATE PAGE REQUESTS

Warning: `DW0050W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#RDIO—Read I/Os

Select Code: #RDIO

Parameter: User-defined identifier for the request or blank.

Measurement: Number of synchronous read I/O requests processed (QBACRIO).

Data Type: Count

Default Title: READ I/Os

Warning: `DW0060W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PFRD—Prefetch Reads

Select Code: #PFRD

Parameter: User-defined identifier for the request or blank (QBACSEQ).

Measurement: Number of prefetch read requests processed.

Data Type: Count

Default Title: PREFETCH READS

Warning: `DW0070W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#WRIT—Write Immediates

Select Code: #WRIT

Parameter: User-defined identifier for the request or blank.

Measurement: Number of Write Immediate I/O requests processed (QBACIMW).

Data Type: Count

Default Title: WRITE IMMEDIATES

Warning: `DW0080W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PFRQ—Prefetch Requests

Select Code: #PFRQ

Parameter: User-defined identifier for the request or blank.

Measurement: Number of prefetch requests processed (sequential, list, dynamic) (QBACSEQ + QBACLPF + QBACDPF).

Data Type: Count

Default Title: PREFETCH REQUESTS

Warning: `DW0290W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PFIO—Prefetch I/Os

Select Code: #PFIO

Parameter: User-defined identifier for the request or blank.

Measurement: Number of prefetch I/O requests processed (QBACRIO).

Data Type: Count

Default Title: PREFETCH I/O

Warning: `DW0300W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PFPG—Prefetch Pages Read

Select Code: #PFPG

Parameter: User-defined identifier for the request or blank.

Measurement: Number of prefetch I/O pages read (QBACSIO).

Data Type: Count

Default Title: PREFETCH PAGES READ

Warning: `DW0310W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#GETF—Conditional GETPAGE Failures

Select code: #GETF

Parameter: User-defined identifier for the request or blank.

Measurement: Number of conditional GETPAGE failures in the buffer pools (QBACNGT).

Data Type: Count

Default Title: CONDITIONAL GETPAGE FAIL

Warning: `DW0320W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#HPVS—Synchronous Hiperpool Reads

Select Code: #HPVS

Parameter: User-defined identifier for the request or blank.

Measurement: Number of successful synchronous reads to move a page from a hiperpool to a virtual buffer pool (QBACHRE).

Data Type: Count

Default Title: SYNC HP READS

Warning: `DW0370W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#HPPG—Asynchronous Hiperpool Pages Read

Select Code: #HPPG

Parameter: User-defined identifier for the request or blank.

Measurement: Number of pages found in a hiperpool and moved to a virtual buffer pool because of a prefetch under control of the agent (QBACHPG).

Data Type: Count

Default Title: HP ASYNC PAGES READ (PF)

Warning: `DW0380W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#GSRD—GBP Synchronous Reads

Select Code: #GSRD

Parameter: User-defined identifier for the request or blank.

Measurement: The number of coupling facility read requests because of the buffer being marked invalid or the requested page not found in the buffer pool (QBGAXD, QBGAXR, QBGAXN (DB2 4.1 only), QBGAMD, QBGAMR, QBGAMN).

Data Type: Count

Default Title: GBP SYNC READS

Warning: `DW0440W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GSWR—GBP Changed Pages Written

Select Code: #GSWR

Parameter: User-defined identifier for the request or blank.

Measurement: The number of changed pages written to the group buffer pool (QBGASW).

Data Type: Count

Default Title: GBP CHANGED PGS WRITTEN

Warning: `DW0450W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GSWC—GBP Clean Pages Written

Select Code: #GSWC

Parameter: User-defined identifier for the request or blank.

Measurement: The number of clean pages written to the group buffer pool (QBGAWC).

Data Type: Count

Default Title: GBP CLEAN PGS WRITTEN

Warning: `DW0460W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 31. CPU Usage Monitors

These services measure the use of CPU time by a transaction. For example, to activate the @CPU service at the default interval specified in BBPARM member BBIISP00 to measure the average transaction CPU time for only those transactions connected to IMS or CICS, issue a warning message to the BBI-SS PAS Journal log if the CPU time for either of these transaction connection types exceeds 2.5 seconds, and log a plot of the collected data to the BBI-SS PAS Image log at the default interval, the request is:

```
SET
REQ=@CPU,WMAX=2.5,LOG=ATINTVL,CONNTYPE=IMS,CICS
```

@CPU—Average CPU Used

Select Code: @CPU

Parameter: User-defined identifier for the request or blank.

Measurement: Average CPU time used by a transaction (QWACSPCP + QWACEJST - QWACBJST).

Data Type: Average

Default Title: AVERAGE CPU USED

Warning: `DW0180W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@CPUD—Average CPU in DB2

Select Code: @CPUD

Parameter: User-defined identifier for the request or blank.

Measurement: Average CPU time in DB2 used by a transaction (QWACAJST + QWACSPPT).

Note: This service returns a zero value when the DB2 accounting trace level 2 is not active.

Data Type: Average

Default Title: AVG CPU IN DB2

Warning: `DW0190W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

Chapter 32. Lock Usage Monitors

These services measure lock activity and contention. For example, to activate the #TMO service every two minutes to measure the amount of transaction timeouts because of a lock or latch wait for transactions using the Call Attachment Facility (CAF) connection, the service request is:

```
SET
REQ=#TMO,I=00:02:00,CONNTYPE=CAF
```

#DDLK—Deadlocks

Select Code: #DDLK

Parameter: User-defined identifier for the request or blank.

Measurement: Number of deadlock conditions detected (QTXADEA).

Data Type: Count

Default Title: DEADLOCKS

Warning: `DW0090W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#TMO—Timeouts

Select Code: #TMO

Parameter: User-defined identifier for the request or blank.

Measurement: Number of times the transaction timed out waiting for a lock or latch (QTXATIM).

Data Type: Count

Default Title: TIMEOUTS

Warning: `DW0100W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#SUSP—Suspensions

Select Code: #SUSP

Parameter: User-defined identifier for the request or blank.

Measurement: Number of times the transaction was suspended for a lock or latch (QTXASLOC).

Data Type: Count

Default Title: SUSPENSIONS

Warning: `DW0110W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#ESCL—Escalations

Select Code: #ESCL

Parameter: User-defined identifier for the request or blank.

Measurement: Number of lock escalations that occurred (QTXALES + QTXALEX).

Data Type: Count

Default Title: ESCALATIONS

Warning: `DW0130W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#MAXL—Maximum Locks Held

Select Code: #MAXL

Parameter: User-defined identifier for the request or blank.

Measurement: Maximum number of locks held by a transaction (QTXANPL).

Data Type: Count

Default Title: MAX LOCKS HELD

Warning: `DW0140W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#CLMF—Claim Failures

Select Code: #CLMF

Parameter: User-defined identifier for the request or blank.

Measurement: Number of claim request failures detected (QTXACLUN).

Data Type: Count

Default Title: CLAIM FAILS

Warning: `DW0240W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#DRNF—Drain Failures

Select Code: #DRNF

Parameter: User-defined identifier for the request or blank.

Measurement: Number of drain request failures detected (QTXADRUN).

Data Type: Count

Default Title: DRAIN FAILS

Warning: `DW0250W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#GSUS—Global Contention Suspensions

Select Code: #GSUS

Parameter: User-defined identifier for the request or blank.

Measurement: The number of suspensions because of global resource contention (QTGAIGLO, QTGASGLO, QTGAFLSE).

Data Type: Count

Default Title: GLOBAL CONTENT SUSPENDS

Warning: `DW0490W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GFAL—False Contention Suspensions

Select Code: #GFAL

Parameter: User-defined identifier for the request or blank.

Measurement: The number of suspensions caused by false contentions (QTGAFLSE).

Data Type: Count

Default Title: FALSE CONTENTION SUSPEND

Warning: `DW0500W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GRTA—Incompatible Retained Lock Suspensions

Select Code: #GRTA

Parameter: User-defined identifier for the request or blank.

Measurement: The number of global lock or change requests denied because of an incompatible retained lock (QTGADRTA).

Data Type: Count

Default Title: INCOMP RETAIN LK SUSPEND

Warning: `DW0510W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GLRQ—Global P-Lock Lock Requests

Select Code: #GLRQ

Parameter: User-defined identifier for the request or blank.

Measurement: The number of lock requests for p-locks (QTGALPLK).

Data Type: Count

Default Title: GLOBAL LK LOCK REQ

Warning: `DW0520W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GLKX—Global Lock XES Requests

Select Code: #GLKX

Parameter: User-defined identifier for the request or blank.

Measurement: The number of both l-lock and p-lock requests propagated to MVS XES synchronously (QTGALSLM).

Data Type: Count

Default Title: GLOBAL LOCK XES REQ

Warning: `DW0560W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

#GNTS—Notify Messages Sent

Select Code: #GNTS

Parameter: User-defined identifier for the request or blank.

Measurement: The number of notify messages sent (QTGANTFY).

Data Type: Count

Default Title: NOTIFY MESSAGES SENT

Warning: `DW0590W (nn) hh:mm:ss title(parm) = v IN x intrvl (>thrshld)`

Chapter 33. Elapsed Time Monitors

These services measure elapsed time for a transaction, DB2 processing, I/O operations, or lock or latch waits. For example, to activate @ELAP at the default interval specified in BBPARM member BBIISP00 to measure the average elapsed time of a transaction originating from authorized JEK1 or NHJ1 user IDs and to log a plot of the collected data to the BBI-SS PAS Image log at the default interval, the service request is:

```
SET
REQ=@ELAP,LOG=ATINTVL,DB2AUTH=JEK1 NHJ1
```

@ELAP—Average Elapsed Time

Select Code: @ELAP

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time for a transaction (QWACESC - QWACBSC).

Data Type: Average

Default Title: AVG ELAPSED TIME

Warning: `DW0120W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELPD—Average Elapsed in DB2

Select Code: @ELPD

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time in DB2 processing (QWACASC).

Note: This service returns a zero value when the DB2 accounting trace level 2 is not active.

Data Type: Average

Default Title: AVG ELAPSED IN DB2

Warning: `DW0150W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELP3—Average Elapsed Wait—All Class 3

Select Code: @ELP3

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time spent waiting for all accounting class 3 reasons (QWACCAST, QWACAWTG, QWACAWTJ, QWACAWTI, QWACAWTL, QWACAWDR, QWACAWCL, QWACAWTP) (QWACAWTR).

Data Type: Average

Default Title: AVG ELAP WAIT-ALL CLASS3

Warning: `DW0430W (nn) hh:mm:ss title(parm) = value (>thrshld)`

@ELIO—Average Elapsed for I/O

Select Code: @ELIO

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time doing I/O operations (QWACAWTI).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR I/O

Warning: `DW0160W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELLK—Average Elapsed for Locks

Select Code: @ELLK

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time the transaction spent waiting for locks or latches in DB2 (QWACAWTL + QWACAWDR + QWACAWCL + QWACAWTP).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR LOCKS

Warning: `DW0170W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELPR—Average Elapsed Time for Prefetch Reads

Select Code: #ELPR

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time spent processing prefetch reads (QWACAWTR).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR PF READ

Warning: `DW0330W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

@ELDR—Average Elapsed for Drain Waits

Select Code: @ELDR

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time the transaction spent waiting for drain (QWACAWDR).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR DRAIN WT

Warning: `DW0260W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELCL—Average Elapsed for Claim Waits

Select Code: @ELCL

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time the transaction spent waiting for claim (QWACAWCL).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR CLAIM WT

Warning: `DW0270W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELPL—Average Elapsed for Page Latch

Select Code: @ELPL

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time the transaction spent waiting for page latch (QWACAWTP).

Note: This service returns a zero value when the DB2 accounting trace level 3 is not active.

Data Type: Average

Default Title: AVG ELAPSED FOR PG LATCH

Warning: `DW0280W (nn) hh:mm: title(TOTAL) = v (>thrshld)`

@ELSP—Average Elapsed Wait—SPROC TCB

Select Code: @ELSP

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed time spent waiting for an available TCB before the stored procedure could be scheduled (QWACCAST).

Data Type: Average

Default Title: AVG ELAP WAIT-SPROC TCB

Warning: `DW0420W (nn) hh:mm:ss title(parm) = value (>thrshld)`

@ELGM—Average Elapsed Wait—Notify Message

Select Code: @ELGM

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed wait time caused by suspension for sending messages to other members in the data sharing group (QWACAWTG).

Data Type: Average

Default Title: AVG ELAP WAIT-NTFY MSG

Warning: `DW0470W (nn) hh:mm:ss title(parm) = value (>thrshld)`

@ELGL—Average Elapsed Wait—Global Lock

Select Code: @ELGL

Parameter: User-defined identifier for the request or blank.

Measurement: Average elapsed wait time caused by suspension of an IRLM lock request due to global lock contention that requires inter-system communication to resolve (QWACAWTJ).

Data Type: Average

Default Title: AVG ELAP WAIT-GLBL LOCK

Warning: `DW0480W (nn) hh:mm:ss title(parm) = value (>thrshld)`

Chapter 34. Transaction Workload Monitor

This service measures the amount of DB2 transactions processed. For example, to activate #PROC at the default interval specified in BBPARM member BBIISP00 to measure the number of DB2 transactions processed for plan QMF230, the service request is:

```
SET
REQ=#PROC,DB2PLAN=QMF230
```

#PROC—Transactions Processed

Select Code:	#PROC
Parameter:	User-defined identifier for the request or blank.
Measurement:	Number of DB2 transactions processed; a transaction is equivalent to a DB2 accounting record.
Data Type:	Count
Default Title:	DB2 TRANS PROCESSED
Warning:	`DW0010W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

Chapter 35. Parallelism Monitors

These services measure the amount of parallel I/O for a transaction. For example, to activate #PRLG at the default interval specified in BBPARM member BBIISP00 to measure the number of parallel groups executed for plan QMF230, the service request is:

```
SET
REQ=#PRLG,DB2PLAN=QMF230
```

#PRLG—Parallel I/O Groups Executed

Select Code: #PRLG

Parameter: User-defined identifier for the request or blank.

Measurement: Total number of parallel groups executed (QXTOTGRP).

Data Type: Count

Default Title: I/O PRLL-GROUPS EXEC

Warning: `DW0340W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PRLR—Parallel I/O Groups Executed Reduced Degree

Select Code: #PRLR

Parameter: User-defined identifier for the request or blank.

Measurement: Number of parallel groups executed to degree less than planned due to storage shortage or buffer pool contention (QXREDGRP).

Data Type: Count

Default Title: I/O PRLL-GROUPS REDUCED

Warning: `DW0350W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PRLF—Parallel I/O Groups Fallback to Sequential

Select Code: #PRLF

Parameter: User-defined identifier for the request or blank.

Measurement: Number of parallel groups that fell back to sequential operation due to:

- Ambiguous cursor
- Lack of ESA SORT support
- Storage shortage or buffer pool contention
- Unavailable MVS/ESA enclave services
- Query Parallelism disabled by the RLF

(QXDEGCUR + QXDEGESA + QXDEGBUF + QXDEGENC + QXRLFDPA)

Data Type: Count

Default Title: I/O PRLL-FALLBACK SEQ

Warning: `DW0360W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

#PRLS—Sysplex Parallel Query Failures

Select Code: #PRLS (DB2 Release 5.1 and later)

Parameter: User-defined identifier for the request or blank.

Measurement: Number of sysplex query failures (QXCOORNO + QXISORR + QXCSKIP).

Data Type: Count

Default Title: SYSPLEX PRLL QUERY FAILS

Warning: `DW0390W (nn) hh:mm: title(TOTAL) = v IN x intrvl (>thrshld)`

Part 5. Appendix/Glossary

The appendix lists the lock types for detail trace events.

Following the appendix is a glossary of terms for all MAINVIEW products.

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Appendix A. Lock Type Table

Table 22 defines the possible lock types and resources for the lock-related detail trace events:

- Detail logical lock - IFCID 21
- Lock Suspension - IFCID 44/45
- Deadlock - IFCID 172
- Timeout - IFCID 196
- Detail physical locks (P-Locks) - IFCIDs 251, 259

Table 22. Lock Types

Lock Type (short)	**Lock Type (long)**	**Resource Name**	**Resource Number (hex)**
ALTER BP	ALTER BUFFERPOOL	BP = bpid	
BINDLOCK	AUTOBIND/REMOTE BIND	BINDLOCK	
CATM CAT	CATMAINT CONVERT CATALOG	DB = database OB = pageset	
CATM DIR	CATMAINT CONVERT DIRECTORY	DB = database OB = pageset	
CATM MIG	CATMAINT MIGRATION	DB = database OB = pageset	
CDB PLOK	CDB P-LOCK (DDF)	DB = database	
COLLECTN	COLLECTION	Collection ID	
CS-DRAIN	CURSOR STABILITY DRAIN	DB = database OB = pageset	Part# / 0
DATABASE	DATABASE	DB = database	
DATAPAGE	DATA PAGE	DB = database OB = pageset	Page#
DBALLOC	DBALLOC - START/STOP	DB = database OB = pageset	Part# / 0
DBCMDSER	DB CMD SERIAL	DB = database	
DBD PLOK	DBD P-LOCK	DB = database	
GBP CAST	GROUP BP CASTOUT P-LOCK	BP = bpid	
GP EX UP	GROUP DB EXCEPTION UPDATE	DX = GDBET	
GROUP BP	GROUP BP START/STOP	BP = bpid	
HASH-ANC	HASH ANCHOR	DB = database OB = pageset	Page# Anchor

Table 22. Lock Types (Continued)

Lock Type (short)	Lock Type (long)	Resource Name	Resource Number (hex)
INDEXPAG	INDEX PAGE (# = x‘000002FF’, index root page)	DB = database OB = pageset	Page# Subpage#
IX EOF	INDEX END-OF-FILE	DB = database OB = pageset	Part# / 0
IXTREEPL	INDEX MANAGER TREE P-LOCK	BP = bpid DB = database OB = pageset	
LPL/GREC	LPL/GRECP DB EXCEPTION	DB = database OB = pageset	Part# / 0
MASSDEL	MASS DELETE	DB = database OB = pageset	
OPEN	OPEN PAGESET / DATASET	DB = database OB = pageset	
PAGE PLK	PAGE P-LOCK	BP = bpid DB = database OB = pageset	Part# / 0 Page#
PAGESET	PAGE SET	DB = database OB = pageset	
PART-DS	PARTITIONED DATASET	DB = database OB = pageset	Part#
PARTLOCK	PARTITION LOCKING	DB = database OB = pageset	Part#
P/P CAST	PAGESET/PARTITION CASTOUT PLOK	BP = bpid DB = database OB = pageset	Part# / 0
P/P PLOK	PAGESET/PARTITION P-LOCK	BP = bpid DB = database OB = pageset	Part# / 0
REPR DBD	REPAIR DBD TEST/DIAGNOSE	DB = database OB = pageset	
RLF PLOK	RLF P-LOCK	DB = database OB = pageset	
ROW	ROW	DB = database OB = pageset	Page# RID
RR-DRAIN	REPEATABLE READ DRAIN	DB = database OB = pageset	Part# / 0
SCA ACC	SCA ACCESS - RESTART/REDO	SC = BMC-RSTP	
SERVICE	SERVICEABILITY	(not identified)	

Table 22. Lock Types (Continued)

Lock Type (short)	Lock Type (long)	Resource Name	Resource Number (hex)
SKCT	SKELETON CURSOR TABLE	PL = planname	
SKPT	SKELETON PACKAGE TABLE	PK = Collection, package, token	
SYSLGRNG	SYSLGRNG RECORDING	DB = database OB = pageset	
TABLE	TABLE	DB = database OB = pageset	
UTIL EXC	UTILITY EXCLUSIVE EXECUTION	UTEXEC	
UTILSER	UTILITY SERIALIZATION	UTSERIAL	
UTILUID	UTILITY UID	UI = utility ID	
WR-DRAIN	WRITE DRAIN	DB = database OB = pageset	Part# / 0

- Page# is 0 for unlocks.
- P-Locks do not cause timeouts or deadlocks, so do not appear for these events.

Glossary

This glossary defines BMC Software terminology. Other dictionaries and glossaries may be used in conjunction with this glossary.

Since this glossary pertains to BMC Software-related products, some of the terms defined may not appear in this book.

To help you find the information you need, this glossary uses the following cross-references:

Contrast with	Indicates a term that has a contrary or contradictory meaning.
See	Indicates an entry that is a synonym or contains expanded information.
See also	Indicates an entry that contains related information.

A

action. Defined operation, such as modifying a MAINVIEW window, that is performed in response to a command. See *object.*

active window. Any MAINVIEW window in which data can be refreshed. See *alternate window, current window, window.*

administrative view. Display from which a product's management tasks are performed, such as the DSLIST view for managing historical data sets. See *view.*

ALT WIN field. Input field that allows you to specify the window identifier for an alternate window where the results of a hyperlink are displayed. See *alternate window.*

Alternate Access. See *MAINVIEW Alternate Access*.

alternate form. View requested through the FORM command that changes the format of a previously displayed view to show related information. See also *form, query.*

alternate window. (1) Window that is specifically selected to display the results of a hyperlink. (2) Window whose identifier is defined to the ALT WIN field. Contrast with *current window.* See *active window, window, ALT WIN field*.

analyzer. (1) Online display that presents a snapshot of status and activity data and indicates problem areas. (2) Component of CMF MONITOR. See *CMF MONITOR Analyzer.*

application. (1) Program that performs a specific set of tasks within a MAINVIEW product. (2) In MAINVIEW VistaPoint, combination of workloads to enable display of their transaction performance data in a single view.

application trace. See *trace.*

ASCH workload. Workload comprising Advanced Program-to-Program Communication (APPC) address spaces.

AutoCustomization. Online facility for customizing the installation of products. AutoCustomization provides an ISPF panel interface that both presents customization steps in sequence and provides current status information about the progress of the installation.

automatic screen update. Usage mode wherein the currently displayed screen is refreshed automatically with new data at an interval you specify. Invoked by the ASU command.

AutoOPERATOR. MAINVIEW product that uses tools, techniques, and facilities to automate routine operator tasks and provide online performance monitoring, and that achieves high availability through error minimization, improved productivity, and problem prediction and prevention.

B

batch workload. Workload consisting of address spaces running batch jobs.

BBI. Basic architecture that distributes work between workstations and multiple MVS targets for BMC Software MAINVIEW products.

BBI-SS PAS. See *BBI subsystem product address space.*

BBI subsystem product address space (BBI-SS PAS).

MVS subsystem address space that manages communication between local and remote systems and that contains one or more of the following products:

- AutoOPERATOR
- MAINVIEW for CICS
- MAINVIEW for DB2
- MAINVIEW for DBCTL
- MAINVIEW for IMS
- Command MQ for S/390
- MAINVIEW VistaPoint (for CICS, DB2, and IMS workloads)

BBPARM. See *parameter library.*

BBPROC. See *procedure library.*

BBPROF. See *profile library.*

BBSAMP. See *sample library.*

BBV. See *MAINVIEW Alternate Access*.

BBXS. BMC Software Subsystem Services. Common set of service routines loaded into common storage and used by several BMC Software MAINVIEW products.

border. Visual indication of the boundaries of a window.

bottleneck analysis. Process of determining which resources have insufficient capacity to provide acceptable service levels and that therefore can cause performance problems.

C

CAS. Coordinating address space. One of the address spaces used by the MAINVIEW windows environment architecture. The CAS supplies common services and enables communication between linked systems. Each MVS image requires a separate CAS. Cross-system communication is established through the CAS using VTAM and XCF communication links.

CFMON. See *coupling facility monitoring.*

chart. Display format for graphical data. See also *graph.*

CICSplex. User-defined set of one or more CICS systems that are controlled and managed as a single functional entity.

CMF MONITOR. Comprehensive Management Facility MONITOR. Product that measures and reports on all critical system resources, such as CPU, channel, and device usage; memory, paging, and swapping activity; and workload performance.

CMF MONITOR Analyzer. Batch component of CMF MONITOR that reads the SMF user and 70 series records created by the CMF MONITOR Extractor and/or the RMF Extractor and formats them into printed system performance reports.

CMF MONITOR Extractor. Component of CMF that collects performance statistics for CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for MVS, and RMF postprocessor. See *CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for MVS*.

CMF MONITOR Online. Component of CMF that uses the MAINVIEW window interface to present data on all address spaces, their use of various system resources, and the delays that each address space incurs while waiting for access to these resources. See *CMF MONITOR, MAINVIEW for MVS.*

CMF Type 79 API. Application programming interface, provided by CMF, that provides access to MAINVIEW SMF-type 79 records.

CMFMON. Component of CMF MONITOR that simplifies online retrieval of information about system hardware and application performance and creates MAINVIEW SMF-type 79 records.

The CMFMON *online facility* can be used to view data in one or more formatted screens.

The CMFMON *write facility* can be used to write collected data as MAINVIEW SMF-type 79 records to an SMF or sequential data set.

CMRDETL. MAINVIEW for CICS data set that stores detail transaction records (type 6E) and abend records (type 6D). Detail records are logged for each successful transaction. Abend records are written when an abend occurs. Both records have the same format when stored on CMRDETL.

CMRSTAT. MAINVIEW for CICS data set that stores both CICS operational statistic records, at 5-minute intervals, and other records, at intervals defined by parameters specified during customization (using CMRSOPT).

column. Vertical component of a view or display, typically containing fields of the same type of information, that varies by the objects associated in each row.

collection interval. Length of time data is collected. See also *delta mode, total mode.*

command delimiter. Special character, usually a **;** (semicolon), used to stack commands typed concurrently on the COMMAND line for sequential execution.

COMMAND line. Line in the control area of the display screen where primary commands can be typed. Contrast with *line command column.*

Command MQ Automation D/S. Command MQ agents, which provide local proactive monitoring for both MQSeries and MSMQ (Microsoft message queue manager). The Command MQ agents operate at the local node level where they continue to perform functions regardless of the availability of the MQM (message queue manager) network. Functionality includes automatic monitoring and restarts of channels, queue managers, queues and command servers. In cases where automated recovery is not possible, the agents transport critical alert information to a central console.

Command MQ Automation S/390. Command MQ component, which monitors the MQM (message queue manager) networks and intercedes to perform corrective actions when problems arise. Solutions include:

- Dead-Letter Queue management
- System Queue Archival
- Service Interval Performance solutions
- Channel Availability

These solutions help ensure immediate relief to some of the most pressing MQM operations and performance problems.

Command MQ for D/S. Command MQ for D/S utilizes a true client/server architecture and employs resident agents to provide configuration, administration, performance monitoring and operations management for the MQM (message queue manager) network.

Command MQ for S/390. Delivers comprehensive capabilities for configuration, administration, performance monitoring and operations management for an entire MQM (message queue manager) network.

COMMON STORAGE MONITOR. Component of MAINVIEW for MVS that monitors usage and reconfigures MVS common storage blocks.

composite workload. Workload made up of a WLM workload or other workloads, which are called *constituent workloads.*

constituent workload. Member of a composite workload. Constituent workloads in a composite usually belong to a single workload class, but sometimes are mixed.

contention. Occurs when there are more requests for service than there are servers available.

context. In a Plex Manager view, field that contains the name of a target or group of targets specified with the CONTEXT command. See *scope, service point, SSI context, target context*.

CONTEXT command. Specifies either a MAINVIEW product and a specific target for that product (see *target context*) or a MAINVIEW product and a name representing one or more targets (see *SSI context*) for that product.

control statement. (1) Statement that interrupts a sequence of instructions and transfers control to another part of the program. (2) Statement that names samplers and other parameters that configure the MAINVIEW components to perform specified functions. (3) In CMF MONITOR, statement in a parameter library member used to identify a sampler in the extractor or a report in the analyzer, or to describe either component's processing requirements to the operating system.

coupling facility monitoring (CFMON). Coupling facility views that monitor the activity of your system's coupling facilities.

CPO. Customized Product Offering. Delivery and installation technique that allows any combination of BMC Software SMP/E-maintainable products to be distributed on a product tape to a customer and installed quickly. The CPO product tape contains libraries required for product customization and execution, plus SMP distribution libraries and data sets needed for application of SMP maintenance.

current data. Data that reflects the system in its current state. The two types of current data are realtime data and interval data. Contrast with *historical data*. See also *interval data and realtime data.*

current window. In the MAINVIEW window environment, window where the main dialog with the application takes place. The current window is used as the default window destination for commands issued on the COMMAND line when no window number is specified. Contrast with *alternate window.* See *active window, window*.

D

DASD. Direct Access Storage Device. (1) A device with rotating recording surfaces that provides immediate access to stored data. (2) Any device that responds to a DASD program.

DASD ADVISOR. An interactive software tool that diagnoses DASD performance problems and makes recommendations to reduce overall service time. This tool measures and reports on the operational performance of IBM and IBM-compatible devices.

data collector. Program that belongs to a MAINVIEW product and that collects data from various sources and stores the data in records used by views. For example, MAINVIEW for MVS data collectors obtain data from MVS services, MVS control blocks, CMF MONITOR Extractor control blocks, and other sources. Contrast with *extractor.*

delta mode. (1) In MAINVIEW for DB2 analyzer displays, difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request. See also *statistics interval.* (2) In CMFMON, usage mode wherein certain columns of data reflect the difference in values between one sample cycle and the next. Invoked by the DELta ON command. See also *collection interval, sample cycle, total mode.*

DMR. See *MAINVIEW for DB2.*

DSO. Data Set Optimizer. CMF MONITOR Extractor component that uses CMF MONITOR Extractor data to produce reports specifying the optimal ordering of data sets on moveable head devices.

E

element. (1) Data component of a data collector record, shown in a view as a field. (2) Internal value of a field in a view, used in product functions.

element help. Online help for a field in a view. The preferred term is *field help.*

Event Collector. Component for MAINVIEW for IMS and MAINVIEW for DBCTL that collects data about events in the IMS environment. This data is required for Workload Monitor and optional for Workload Analyzer (except for the workload trace service). This data also is recorded as transaction records (X'FA') and program records (X'F9') on the IMS system log for later use by the batch products: Performance Reporter and Transaction Accountant. If the Extensions for DB2 option to IMS PR, IMS TA, IMS WA, or IMS WM is installed, the Event Collector also measures DB2 activity through the Attach facility.

expand. Predefined link from one display to a related display. See also *hyperlink.*

Extensions for DB2. Additions to MAINVIEW for IMS and MAINVIEW for DBCTL that gather DB2 subsystem activity through the IMS Attach facility. These additions are licensed as options to IMS PR, IMS TA, IMS WA, and IMS WM. No license is required for IMS RA, IMS RM, and AutoOPERATOR for IMS.

Extensions for IRLM. Additions to MAINVIEW for IMS and MAINVIEW for DBCTL that analyze database locking and measure IRLM activity when IRLM is used. These additions are licensed as options to IMS RA and IMS RM.

extractor. Program that collects data from various sources and keeps the data control blocks to be written as records. Extractors obtain data from services, control blocks, and other sources. Contrast with *data collector.*

extractor interval. See *collection interval.*

F

fast path. Predefined link between one screen and another. To use the fast path, place the cursor on a single value in a field and press Enter. The resulting screen displays more detailed information about the selected value. See also *hyperlink.*

field. Group of character positions within a screen or report used to type or display specific information.

field help. Online help describing the purpose or contents of a field on a screen. To display field help, place the cursor anywhere in a field and press PF1 (HELP). In some products, field help is accessible from the screen help that is displayed when you press PF1.

filter. Selection criteria used to limit the number of rows displayed in a view. Data that does not meet the selection criteria is not displayed. A filter is composed of an element, an operator, and an operand (a number or character string). Filters can be implemented in view customization, through the PARm/QPARm commands, or through the Where/QWhere commands. Filters are established against elements of data.

fixed field. Field that remains stationary at the left margin of a screen that is scrolled either right or left.

FOCAL POINT. MAINVIEW product that displays a summary of key performance indicators across systems, sites, and applications from a single terminal.

form. One of two constituent parts of a view; the other is query. A form defines how the data is presented; a query identifies the data required for the view. See also *query, view.*

full-screen mode. Display of a MAINVIEW product application or service on the entire screen. There is no window information line. Contrast with *windows mode.*

G

global command. Any MAINVIEW window interface command that can affect all windows in the window area of a MAINVIEW display.

graph. Graphical display of data that you select from a MAINVIEW window environment view. See also *chart.*

H

hilevel. For MAINVIEW products, high-level data set qualifier required by a site's naming conventions.

historical data. (1) Data that reflects the system as it existed at the end of a past recording interval or the duration of several intervals. (2) Any data stored in the historical database and retrieved using the TIME command. Contrast with *current data, interval data and realtime data.*

historical database. Collection of performance data written at the end of each installation-defined recording interval and containing up to 100 VSAM clusters. Data is extracted from the historical database with the TIME command. See *historical data.*

historical data set. In MAINVIEW products that display historical data, VSAM cluster file in which data is recorded at regular intervals.

hyperlink. (1) Preset field in a view or an EXPAND line on a display that permits you to

- Access cursor-sensitive help
- Issue commands
- Link to another view or display

The transfer can be either within a single product or to a related display/view in a different MAINVIEW product. Generally, hyperlinked fields are highlighted. (2) Cursor-activated short path from a topic or term in online help to related information. See also *fast path.*

I

Image log. Collection of screen-display records. Image logs may be created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Image log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Image log stops when both data sets are filled and the first data set is not processed by the archive program.

The TS Image log is a single data set that wraps around when full.

IMS PERFORMANCE REPORTER (IMS PR). Offline product that organizes data and prints reports that can be used to analyze IMS performance.

IMS PR EXTENSIONS for DB2. Licensed option to the IMS Performance Reporter that provides offline statistical, graphic, and calendar reports about DB2 subsystem activity and requests that are integrated with IMS activity.

IMS RA EXTENSIONS for DB2. Additions to the IMS Resource Analyzer that provide online monitoring displays of DB2 region connection and thread status.

IMS RESOURCE ANALYZER (IMS RA). Online realtime displays used to analyze IMS resources and determine which are affected by specific workload problems.

IMS RESOURCE MONITOR (IMS RM). Online data collection services used to monitor IMS resources and issue warnings when defined utilization thresholds are exceeded.

IMS RM EXTENSIONS for DB2. Additions to the IMS Resource Monitor that provide timer-driven data collection of DB2 region connection and threads.

IMS TA EXTENSIONS for DB2. Licensed option to the IMS Transaction Accountant that provides integrated accounting of IMS and DB2 activity through the IMS Attach Facility.

IMS TRANSACTION ACCOUNTANT (IMS TA). Offline product used to produce cost accounting and user charge-back records and reports.

IMS WA EXTENSIONS for DB2. Licensed option to the IMS Workload Analyzer that provides

- Timer-driven workload wait and trace data collection
- Displays of the transaction active and wait time for DB2 processing events
- Trace of DB2 subsystem activity

  The trace is either summarized by DB2 calls and CPU usage for DB2 processing or detailed to include call start, elapsed times, SQL statement numbers, and return codes.

IMS WORKLOAD ANALYZER (IMS WA). Online data collection and display services used to analyze IMS workloads and determine problem causes.

IMS WM EXTENSIONS for DB2. Licensed option to the IMS Workload Monitor that provides timer-driven data collection of the types and number of calls issued to a DB2 subsystem, DB2 transaction input queue and response time, and average DB2 CPU time per transaction.

IMS WORKLOAD MONITOR (IMS WM). Online data collection services used to monitor IMS workloads and issue warnings when defined thresholds are exceeded.

IMSPlex System Manager (IPSM). Online service that provides Single System Image views of resources and bottlenecks for applications across one or more IMS regions and systems.

interval data. Cumulative data collected during a collection interval. Intervals usually last from 15 to 30 minutes depending on how the recording interval is specified during product customization. Contrast with *historical data*.

Note: If change is made to the workloads, a new interval will be started.

See also *current data and realtime data.*

InTune. Product for improving application program performance. It monitors the program and provides information used to reduce bottlenecks and delays.

IRUF. IMS Resource Utilization File (IRUF). IRUFs can be either detailed (one event, one record) or summarized (more than one event, one record). A detailed IRUF is created by processing the IMS system log through a program called IMFLEDIT. A summarized IRUF is created by processing one or more detailed IRUFs, one or more summarized IRUFs, or a combination of both, through a sort program and the TASCOSTR program. If the Extensions for DB2 option to IMS PR or IMS TA is installed, the IRUF includes data about DB2 calls made through the IMS Attach Facility.

J

job activity view. Report about address space consumption of resources. See *view.*

journal. Special-purpose data set that stores the chronological records of operator and system actions.

Journal log. Collection of messages. Journal logs are created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Journal log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Journal log stops when both data sets are filled and the first data set is not being processed by the archive program.

The TS Journal log is a single data set that wraps around when full.

L

line command. Command that you type in the line command column in a view or display. Line commands initiate actions that apply to the data displayed in that particular row.

line command column. Command input column on the left side of a view or display. Contrast with *COMMAND line.*

log edit. In the MAINVIEW for IMS and MAINVIEW for DBCTL program named IMFLEDIT, function that extracts transaction (X‘FA’) and program (X‘F9’) records from the IMS system log. IMFLEDIT also extracts certain records that were recorded on the system log by IMS. IMFLEDIT then formats the records into a file called the IMS Resource Utilization File (IRUF).

M

MAINVIEW. BMC Software integrated systems management architecture.

MAINVIEW Alarm Manager. Monitor that reads the data elements produced by products in the MAINVIEW window environment and returns SQL-syntactic statements.

MAINVIEW Alternate Access. Enables MAINVIEW products to be used without TSO by providing access through EXCP and VTAM interfaces.

MAINVIEW control area. In the MAINVIEW window environment, first three lines at the top of the view containing the window information line and the COMMAND, SCROLL, CURR WIN, and ALT WIN lines. The control area cannot be customized and is part of the information display. Contrast with *MAINVIEW display area, MAINVIEW window area.*

MAINVIEW Desktop. Version of the MAINVIEW window interface designed to run on OS/2 and Windows workstations.

MAINVIEW display area. See *MAINVIEW window area.*

MAINVIEW Explorer. Product that provides access to MAINVIEW products from a Web browser running under Windows. MAINVIEW Explorer replaces MAINVIEW Desktop.

MAINVIEW for CICS. Product (formerly MV MANAGER for CICS) that provides realtime application performance analysis and monitoring for CICS system management.

MAINVIEW for DB2. Product (formerly MV MANAGER for DB2) that provides realtime and historical application performance analysis and monitoring for DB2 subsystem management.

MAINVIEW for DBCTL. Product (formerly MV MANAGER for DBCTL) that provides realtime application performance analysis and monitoring for DBCTL management.

MAINVIEW for IMS. Product (formerly MV MANAGER for IMS) that provides realtime application performance analysis and monitoring for IMS management.

MAINVIEW for MVS. System management application (formerly MV MANAGER for MVS). Built upon the MAINVIEW window environment architecture, it uses the window interface to provide access to system performance data and other functions necessary in the overall management of an enterprise.

MAINVIEW for OS/390. System management application (formerly MAINVIEW **for MVS (**prior to version 2.5)). Built upon the MAINVIEW window environment architecture, it uses the window interface to provide access to system performance data and other functions necessary in the overall management of an enterprise.

MAINVIEW for UNIX System Services. System management application that allows you to monitor the performance of the Unix System Services from a MAINVIEW window interface.

MAINVIEW for VTAM. Product that displays application performance data by application, transaction ID, and LU name. This collected data includes: connections, response time statistics, application availability, and application throughput.

MAINVIEW Selection Menu. ISPF selection panel that provides access to all MAINVIEW windows-mode and full-screen mode products.

MAINVIEW VistaPoint. Product that provides enterprise-wide views of performance. Application and workload views are available for CICS, DB2, IMS, and MVS. Data is summarized at the level of detail needed; e.g., reports may be for a single target, an MVS image, or an entire enterprise.

MAINVIEW window area. Portion of the information display that is not the control area and in which views are displayed and windows opened. It includes all but the first three lines of the information display. Contrast with *MAINVIEW control area*.

monitor. Online service that measures resources or workloads at user-defined intervals and issues warnings when user-defined thresholds are exceeded.

MV MANAGER for CICS. See *MAINVIEW for CICS.*

MV MANAGER for DB2. See *MAINVIEW for DB2.*

MV MANAGER for DBCTL. See *MAINVIEW for DBCTL.*

MV MANAGER for IMS. See *MAINVIEW for IMS.*

MV MANAGER for MVS. See *MAINVIEW for MVS.*

MVALARM. See *MAINVIEW Alarm Manager.*

MVCICS. See *MAINVIEW for CICS.*

MVDB2. See *MAINVIEW for DB2.*

MVDBC. See *MAINVIEW for DBCTL.*

MVIMS. See *MAINVIEW for IMS.*

MVMQS. See *Command MQ for S/390*

MVMVS. See *MAINVIEW for OS/390.*

MVS product address space (PAS). Address space containing MVS data collectors, including the CMF MONITOR Extractor. Used by MAINVIEW for MVS and CMF MONITOR products. See *PAS.*

MVScope. MAINVIEW for MVS application that traces both CPU usage down to the CSECT level and I/O usage down to the channel program level.

MVVP. See *MAINVIEW VistaPoint.*

MVVTAM. See *MAINVIEW for VTAM.*

N

nested help. Multiple layers of help pop-up windows. Each successive layer is accessed by hyperlinking from the previous layer.

O

object. Anything you can manipulate as a single unit. MAINVIEW objects can be any of the following: product, secondary window, view, row, column, or field.

You can issue an action against an object by issuing a line command in the line command column to the left of the object. See *action*.

OMVS workload. Workload consisting of MVS OpenEdition address spaces.

online help. Help information that is accessible online.

P

parameter library. Data set comprised of members containing parameters for specific MAINVIEW products or a support component. There can be several versions:

- The distributed parameter library, called BBPARM
- A site-specific parameter library or libraries

  These can be

  – A library created by AutoCustomization, called UBBPARM

  – A library created manually, with a unique name

PAS. Product address space. Used by the MAINVIEW products. Contains data collectors and other product functions. See *MVS product address space (PAS), BBI subsystem product address space (BBI-SS PAS).*

performance group workload. MVS/SP-defined collection of address spaces. See *service class workload, workload definition.*

PERFORMANCE MANAGER. MAINVIEW for CICS online service for monitoring and managing current performance of CICS regions.

PERFORMANCE REPORTER. Product component that generates offline batch reports. The following products can generate these reports:

- MAINVIEW for DB2
- MAINVIEW for IMS
- MAINVIEW for CICS

Plex Manager. Product through which cross-system communication, MAINVIEW security, and an SSI context are established and controlled. Plex Manager is shipped with MAINVIEW window environment products as part of the coordinating address space (CAS) and is accessible as a menu option from the MAINVIEW Selection Menu.

pop-up window. Window containing help information that, when active, overlays part of the window area. A pop-up panel is displayed when you issue the HELP command.

PRGP workload. In MVS/SP 5.0 or earlier, or in compatibility mode in MVS/SP 5.1 or later, composite of service classes. MAINVIEW for MVS creates a performance group workload for each performance group defined in the current IEAIPSxx member.

procedure library. Data set comprised of members containing executable procedures used by AutoOPERATOR. These procedures are execute command lists (EXECs) that automate site functions. There can be several versions:

- The distributed parameter library, called BBPROC
- A site-specific parameter library or libraries

  These can be

  – A library created by AutoCustomization, called UBBPROC

  – A library created manually, with a unique name

The site-created EXECs can be either user-written or customized AutoOPERATOR-supplied EXECs from BBPROC.

product address space. See *PAS.*

profile library. Data set comprised of members containing profile information and cycle refresh definitions for a terminal session connected to a BBI-SS PAS. Other members are dynamically created by MAINVIEW applications. There can be several versions:

- The distributed profile library, called BBPROF
- A site-specific profile library or libraries

  These can be

  – A library created by AutoCustomization, called SBBPROF

  – A library created manually, with a unique name

The site library is a common profile shared by all site users. The terminal session CLIST creates a user profile automatically if one does not exist; it is called userid.BBPROF, where userid is your logon ID. User profile libraries allow each user to specify unique PF keys, CYCLE commands, target system defaults, a Primary Option Menu, and a unique set of application profiles.

Q

query. One of two constituent parts of a view; the other is form. A query defines the data for a view; a form defines the display format. See also *form, view.*

R

realtime data. Performance data as it exists at the moment of inquiry. Realtime data is recorded during the smallest unit of time for data collection. Contrast with *historical data.* See also *current data and interval data.*

row. (1) Horizontal component of a view or display comprising all the fields pertaining to a single device, address space, user, etc. (2) Horizontal component of a DB2 table consisting of a sequence of values, one for each column of the table.

RxD2. Product that provides access to DB2 from REXX. It provides tools to query the DB2 catalog, issue dynamic SQL, test DB2 applications, analyze EXPLAIN data, generate DDL or DB2 utility JCL, edit DB2 table spaces, perform security administration, and much more.

S

sample cycle. Time between data samples.

For the CMF MONITOR Extractor, this is the time specified in the extractor control statements (usually 1 to 5 seconds).

For realtime data, the cycle is not fixed. Data is sampled each time you press Enter.

sample library. Data set comprised of members each of which contains one of the following:

- Sample JCL that can be edited to perform specific functions
- A macro that is referenced in the assembly of user-written services
- A sample user exit routine

There can be several versions:

- The distributed sample library, called BBSAMP
- A site-specific sample library or libraries

  These can be

  – A library created by AutoCustomization, called UBBSAMP

  – A library created manually, with a unique name

sampler. Program that monitors a specific aspect of system performance. Includes utilization thresholds used by the Exception Monitor. The CMF MONITOR Extractor contains samplers.

SBBPROF. See *profile library.*

scope. Subset of an SSI context. The scope could be all the data for the context or a subset of data within the context. It is user- or site-defined. See *SSI context, target*.

screen definition. Configuration of one or more views that have been stored with the SAVEScr command and assigned a unique name. A screen includes the layout of the windows and the view, context, system, and product active in each window.

selection view. In MAINVIEW products, view displaying a list of available views.

service class workload. MVS- or MAINVIEW for MVS-defined collection of address spaces.

If you are running MVS Workload Manager (WLM) in goal mode, MAINVIEW for MVS creates a service class workload for each service class that you define through WLM definition dialogs.

If you are running MVS 4.3 or earlier, or MVS/SP 5.1 or later with WLM in compatibility mode, MVS creates a performance group workload instead of a service class. See *performance group workload*.

service objective. Workload performance goal, specified in terms of response time for TSO workloads or turnaround time for batch workloads. Performance group workloads can be measured by either objective. Composite workload service objectives consist of user-defined weighting factors assigned to each constituent workload. There are no MVS-related measures of service for started task workloads.

service point. Specification, to MAINVIEW, of the services required to enable a specific product. Services may be actions, selectors, or views. Each target (e.g., CICS, DB2, or IMS,) has its own service point.

The PLEX view lists all the defined service points known to the CAS to which the terminal session is connected.

service request block (SRB). Control block that represents a routine to be dispatched. SRB mode routines generally perform work for the operating system at a high priority. An SRB is similar to a task control block (TCB) in that it identifies a unit of work to the system. See also *task control block.*

service select code. Code entered to invoke analyzers, monitors, and general services. This code is also the name of the individual service.

session. Total period of time an address space has been active. A session begins when monitoring can be performed. If the product address space (PAS) starts after the job, the session starts with the PAS.

SRB. See *service request block.*

single system image (SSI). Feature of the MAINVIEW window environment architecture that allows you to view and perform actions on multiple MVS systems as though they were a single system. The rows of a single tabular view can contain rows from different MVS images.

SpaceView for MVS. Suite of products that assist in all phases of MVS storage management. SpaceView consists of components that perform automation, reporting, trend analysis, and error correction for storage management in MVS.

SSI. See *single system image.*

SSI context. Name created to represent one or more targets for a given product. See *context, target.*

started task workload. Address spaces running jobs that were initiated programmatically.

statistics interval. For MAINVIEW for DB2, cumulative count within a predefined interval (30-minute default set by the DB2STATS parameter in the distributed BBPARM member BBIISP00) for an analyzer service DELTA or RATE display. Specifying the DELTA parameter displays the current value as the difference between the value sampled by the current analyzer request and the value sampled at the start of the current interval. Specifying the RATE parameter displays the current value by minute (DELTA divided by the number of elapsed minutes).

summary view. View created from a tabular view using the Summarize option in view customization. A summary view compresses several rows of data into a single row based on the summarize criteria.

system resource. See *object.*

T

target. Entity monitored by one or more MAINVIEW products, such as an MVS image, IMS or DB2 subsystem, CICS region, or related workloads across systems. See *context, scope, SSI context*.

target context. Single target/product combination. See *context.*

TASCOSTR. MAINVIEW for IMS and MAINVIEW for DBCTL program that summarizes detail and summary IMS Resource Utilization Files (IRUFs) to be used as input to the offline products.

task control block (TCB). Address space-specific control block that represents a unit of work that is dispatched in the address space in which it was created. See also *service request block.*

TCB. See *task control block.*

terminal session (TS). Single point of control for MAINVIEW products, allowing data manipulation and data display and providing other terminal user services for MAINVIEW products. The terminal session runs in a user address space (either a TSO address space or a standalone address space for EXCP/VTAM access).

TDIR. See *trace log directory.*

threshold. Specified value used to determine whether the data in a field meets specific criteria.

TLDS. See *trace log data set.*

total mode. Usage mode in CMFMON wherein certain columns of data reflect the cumulative value between collection intervals. Invoked by the DELta OFF command. See also *collection interval, delta mode.*

trace. (1) Record of a series of events chronologically listed as they occur. (2) Online data collection and display services that track transaction activity through DB2, IMS, or CICS.

trace log data set (TLDS). Single or multiple external VSAM data sets containing summary or detail trace data for later viewing or printing. The trace log(s) can be defined as needed or dynamically allocated by the BBI-SS PAS. Each trace request is assigned its own trace log data set(s).

trace log directory (TDIR). VSAM linear data set containing one entry for each trace log data set. Each entry indicates the date and time of data set creation, the current status of the data set, the trace target, and other related information.

transaction. Specific set of input data that initiates a predefined process or job.

TS. See *terminal session.*

TSO workload. Workload that consists of address spaces running TSO sessions.

U

UAS. See *user address space.*

UBBPARM. See *parameter library*.

UBBPROC. See *procedure library*.

UBBSAMP. See *sample library.*

user address space. Runs a MAINVIEW terminal session (TS) in TSO, VTAM, or EXCP mode.

User BBPROF. See *profile library.*

V

view. Formatted data within a MAINVIEW window, acquired from a product as a result of a view command or action. A view consists of two parts: query and form. See also *form, job activity view, query.*

view definition. Meaning of data that appears online, including source of data, selection criteria for data field inclusion and placement, data format, summarization, context, product, view name, hyperlink fields, and threshold conditions.

view command. Name of a view that you type on the COMMAND line to display that view.

view command stack. Internal stack of up to 10 queries. For each command, the stack contains the filter parameters, sort order, context, product, and timeframe that accompany the view.

view help. Online help describing the purpose of a view. To display view help, place the cursor on the view name on the window information line and press PF1 (HELP).

W

window. Area of the MAINVIEW screen in which views and resources are presented. A window has visible boundaries and can be smaller than or equal in size to the MAINVIEW window area. See *active window, alternate window, current window, MAINVIEW window area*.

window information line. Top border of a window. Shows the window identifier, the name of the view displayed in the window, the system, the scope, the product reflected by the window, and the timeframe for which the data in the window is relevant. See also *window status field.*

window number. Sequential number assigned by MAINVIEW to each window when it is opened. The window number is the second character in the window status field. See also *window status field.*

window status. One-character letter in the window status field that indicates when a window is ready to receive commands, is busy processing commands, is not to be updated, or contains no data. It also indicates when an error has occurred in a window. The window status is the first character in the window status field. See also *window information line, window status field.*

window status field. Field on the window information line that shows the current status and assigned number of the window. See also *window number, window status.*

windows mode. Display of one or more MAINVIEW product views on a screen that can be divided into a maximum of 20 windows. A window information line defines the top border of each window. Contrast with *full-screen mode.*

WLM workload. In goal mode in MVS/SP 5.1 and later, a composite of service classes. MAINVIEW for MVS creates a workload for each WLM workload defined in the active service policy.

workflow. Measure of system activity that indicates how efficiently system resources are serving the jobs in a workload.

workload. (1) Systematic grouping of units of work (e.g., address spaces, CICS transactions, IMS transactions) according to classification criteria established by a system administrator. (2) In MVS, group of service classes within a service definition.

workload activity view. Tracks workload activity as the workload accesses system resources. A workload activity view measures workload activity in terms of resource consumption and how well the workload activity meets its service objectives.

workload definition. Workload created through the WKLIST view. Contains a unique name, a description, an initial status, a current status, and selection criteria by which address spaces are selected for inclusion in the workload. See *Workload Definition Facility.*

Workload Definition Facility. In MAINVIEW for MVS, WKLIST view and its associated dialogs through which workloads are defined and service objectives set.

workload delay view. Tracks workload performance as the workload accesses system resources. A workload delay view measures any delay a workload experiences as it contends for those resources.

workload objectives. Performance goals for a workload, defined in WKLIST. Objectives may include measures of performance such as response times and batch turnaround times.

Part 6. Index

This part contains the index.

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