



Monitoring and Resolving Db2 Operational Problems

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Objectives

Monitoring and Resolving Db2 Operational Problems

In this module, you will look at the Db2 commands used to display the status and attributes of Db2 databases and associated components and how to interpret the messages produced by these commands.

You will also be introduced to Db2 commands that can be used to start and stop Db2 components and modify their attributes.

After completing this module, you will be able to:

- · Display the Status and Attributes of Databases, Buffer Pools, Logs, Utilities and Threads
- · Start and Stop Db2 Databases
- Modify Attributes Associated With Buffer Pools, Logs, Utilities and Threads

How can you display the status of DB2 database components?

Which DB2 commands can be used to stop a database?



How do you start a database?

With Db2 up and running there is usually only a minimal amount of monitoring that is required by the operator. The Db2 commands described in this section are used when there is a scenario that requires you to display the status or attributes of Db2 databases or they need to be stopped or restarted.







```
INFLIGHT=0, IN ABORT=0, POSTPONED ABORT=0
DSNG007I -DB1A DB2 CATALOG LEVEL (1110) CODE LEVEL (1110) MODE (NFM)
DSNR002I -DB1A RESTART COMPLETED
-DB1ARECOVER POSTPONED
DSNV434I -DB1A DSNVRP NO POSTPONED ABORT THREADS FOUND
DSNV0791 -DB1A DSNVRP 'RECOVER POSTPONED' NORMAL COMPLETION
DSNL0031 -DB1A DDF IS STARTING
DSN30291 -DB1A DSN3RRS RRS ATTACH PROCESSING IS AVAILABLE
DSNL5191 -DB1A DSNLILNR TCP/IP SERVICES AVAILABLE
                 FOR DOMAIN SOW1.DAL-EBIS.IHOST.COM AND PORT 5025
DSNL004I
               -DB1A DDF START COMPLETE
                 LOCATION DALLAS9
                                USASDV02.DB1ALU1
                 GENERICLU -NONE
                                SOW1.DAL-EBIS.IHOST.COM 5025
                 DOMAIN
                 TCPPORT
                 SECPORT
                                5026
                 RESPORT
IPNAME -NONE
DSN9022I -DB1A DSNYASCP 'START DB2' NORMAL COMPLETION
IEE612I CN=C01         DEVNUM=160 SYS=PROD
-db1a display database(*)
IEE163I MODE= RD
```



While you may use several tools to measure how your Db2 database is performing, the DISPLAY DATABASE command is capable of providing a good snapshot of your database structure and activity.

Type -DB1A DISPLAY DATABASE(*) and press Enter to display details of all databases associated with the DB1A Db2 subsystem.







This command will display information relating to table spaces and index spaces that are defined to the databases that form the Db2 subsystem.

If this command was entered as a result of a performance issue then you will want to look at the status information. A status of RO (read only) or RW (read write) may be acceptable but other statuses could indicate that an object requires some attention.

Mouse-over the response for an explanation of items displayed.







```
SYSEBCDC TS RW
SYSGROUP TS RW
SYSHIST TS RW
SYSHIST TS RW
SYSJAUXA LS RW
SYSJAUXA LS RW
SYSJAUXB LS RW
SYSJAVA TS RW
SYSJAVA TS RW
SYSPLAN TS RW
SYSPRAGE TS RW
SYSPKAGE TS RW
SYSPLUXA LS RW
SYSPLAN TS RW
SYSPLUXA LS RW
SYSPLUXA LS RW
SYSPLUXA LS RW
SYSPLUXA LS RW
SYSROLES TS RW
SYSROLES TS RW
SYSROLES TS RW
SYSSROLE TS RW
SYSSEQ TS RW
SYSSIATS TS RW
SYSSEQ TS RW
SYSSIATS TS RW
SYSSEQ TS RW
SYSSIATS TS RW
SYSSEQ TS RW
SYSSIATS TS RW
SYSS
```

As the response to this command scrolls through, the highlighted messages indicate that the number of messages created has exceeded a defined maximum.

If you need to control the amount of information produced by Db2 commands, then a LIMIT option can be added to the command. In this scenario, the -DB1A DISPLAY DATABASE(*) LIMIT(*) command can be used to display the response using the maximum amount of space available.











This command will only display databases, table spaces and index spaces with a restricted status, that is, those objects that have been stopped, are in read-only status or started for utility only processing.

A number of variations can be specified with the DISPLAY DATABASE command that allows you to view more specific information.

Mouse-over the examples above for a description of that command.

E===:1

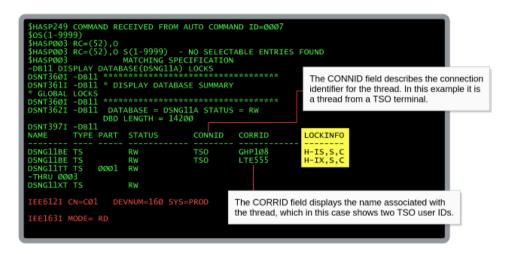
Another useful option that can be specified on the -DISPLAY DATABASE command is the LOCKS option. If a problem has occurred where access to a particular table space or index space is not possible because another entity has locked it for use, then this option will display details relating to that lock.

Type -DB11 DISPLAY DATABASE(DSNG11A) LOCKS and press Enter to display the locks for database DSNG11A.





Monitoring and Managing Databases > Displaying Database Status and Attributes



The output displayed here shows information that describes the lock status, lock state, lock type and lock duration for objects in the specified database. In this example the LOCKINFO data indicates the following:

- H the lock is held by the agent or the Db2 member.
- IS it is a lock with read intentions. IX is a lock with update intentions.
- S the lock type is a table space logical lock.
- C the lock is freed at commit time.





```
$hasp003 rc=(52),0
$hasp003 rc=(52),0 s(1-9999) - no selectable entries found
                 MATCHING SPECIFICATION
DSNT361I -DB11 * DISPLAY DATABASE SUMMARY
DBD LENGTH = 14200
DSNT397I -DB11
        TYPE PART STATUS
                              CONNID
                                      CORRID
                                                  LOCKINFO
                                      GHP108
DSNG11BE TS
                  RW
                              TSO
                                                  H-IS,S,C
DSNG11BE TS
                              TS0
                                      LTE555
                                                  H-IX,S,C
            0001 RW
DSNG11TT TS
-THRU 0003
DSNG11XT TS
DSN9022I -DB11 DSNTDDIS 'DISPLAY DATABASE' NORMAL COMPLETION
IEE612I CN=C01 DEVNUM=160 SYS=PROD
-db11 stop database(*)
IEE163I MODE= RD
```



Step 1 of 3

If a database problem has been identified, you may be required to temporarily stop the database so that maintenance activity can be performed. Rather than bring down the entire Db2 subsystem, the STOP DATABASE command can be used to stop one or more databases or database components, preventing applications from using them.

Type -DB11 STOP DATABASE(*) and press Enter, to stop all databases for the DB11 Db2 subsystem.





```
DSNT360I -DB11 *******************
DSNT361I -DB11 * DISPLAY DATABASE SUMMARY
 GLOBAL LOCKS
DSNT360I -DB11 *******************
DSNT362I -DB11 DATABASE = DSNG11A STATUS = RW
                DBD LENGTH = 14200
DSNT397I -DB11
         TYPE PART STATUS
                                   CONNID
                                             CORRID
                                                           LOCKINFO
DSNG11BE TS
                     RW
                                   TSO
                                             GHP108
                                                           H-IS,S,C
DSNG11BE TS
                     RW
                                   TS0
                                             LTE555
                                                           H-IX,S,C
              0001 RW
DSNG11TT TS
-THRU 0003
DSNG10XT TS
                     RW
****** DISPLAY OF DATABASE DSNG11A ENDED
DSN9022I -DB11 DSNTDDIS 'DISPLAY DATABASE' NORMAL COMPLETION
SN9022I -DB11 DSNTDDIS 'STOP DATABASE' NORMAL COMPLETION DSNT736I -DB11 ASYNCHRONOUS STOP DATABASE COMMAND
 AS COMPLETED FOR COMMAND: STOP DB(*)
IEE612I CN=C01 DEVNUM=160 SYS=PROD
-db11 display database(*)
IEE163I MODE= RD
```

Step 2 of 3

The messages shown here indicate that the execution of the command has been successful.

Type -DB11 DISPLAY DATABASE(*) and press Enter so you can see the status now displayed for the databases within the DB11 Db2 subsystem.

```
DSNT360I -DB11 *******************
DSNT362I -DB11
                 DATABASE = DSNDB07 STATUS = RW
                DBD LENGTH = 4028
DSNT397I -DB11
       TYPE PART STATUS
                                  PHYERRLO PHYERRHI CATALOG PIECE
DSN32K00 TS
DSN4K00 TS
                 RW
****** DISPLAY OF DATABASE DSNDB07 ENDED
DSNT360I -DB11 ******************
       -DB11
                 DATABASE = ADBDCH STATUS = STOP
                DBD LENGTH = 8066
DSNT397I -DB11
       TYPE PART STATUS
                                 PHYERRLO PHYERRHI CATALOG PIECE
ADBSCH TS
                 RW
ADBCHKX1 IX
                 RW
****** DISPLAY OF DATABASE ADBDCH ENDED
DSNT360I -DB11 ******************
DSNT362I -DB11
                 DATABASE = DSNADMDB STATUS = STOP
IEE612I CN=C01
              DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

Step 3 of 3

The information shown here only displays a cross section of the responses. It shows that several databases have been stopped, but not database DSNDB07.

The -DB11 STOP DATABASE(*) command will not automatically shutdown databases DSNDB01, DSNDB06, and DSNDB07, but they can be stopped individually using a command such as:

-DB11 STOP DATABASE(DSNDB07)







A specific table space or index space can be targeted with the stop database command by using the SPACENAM option. This command might be useful if an object needs to be restored and it first needs to be made unavailable. Wildcard characters can also be specified as part of the name.

A number of variations are possible with the STOP DATABASE command depending on the problem but you would be unlikely to use them unless instructed by the systems programmer.

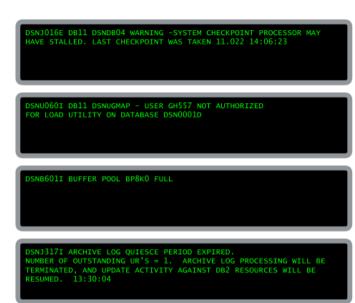
Mouse-over the commands for a description of its purpose.



If a database or one of its components has been stopped and is now ready to be restarted, the START DATABASE command can be invoked.

Note that if the DSNDB01, DSNDB06, or DSNDB07 databases have been specifically stopped, then they will need to be individually started using a command such as -START DATABASE(DSNDB06).





In this section you will look at a number of Db2 display commands that can assist you in obtaining Db2 component or object status and attribute details. This information can then be used to assist you in resolving a Db2 problem or might be required when escalating a problem to a Db2 specialist.







Step 1 of 2

If performance statistics indicate an issue with a buffer pool or an error message indicates a problem with this resource, then your first action should be to display the current status and characteristics of the buffer pool.

Type -DB11 DISPLAY BUFFERPOOL and press Enter to display information for all active buffer pools.





```
-DB11 DISPLAY BUFFERPOOL
DSNB401I -DB11 BUFFERPOOL NAME BPO, BUFFERPOOL ID 0, USE COUNT 17
         -DB11 BUFFER POOL SIZE = 20000 BUFFERS AUTOSIZE = NO
            ALLOCATED
                                 20000
                                         TO BE DELETED =
            IN-USE/UPDATED =
                                  9790
                                         BUFFERS ACTIVE =
                                                               1428
DSNB406I -DB11 PGFIX ATTRIBUTE -
            CURRENT = NO
            PENDING = NO
          PAGE STEALING METHOD = LRU
DSNB404I -DB11 THRESHOLDS -
           VP SEQUENTIAL
                          = 80
= 30
           DEFERRED WRITE
                                  VERTICAL DEFERRED WRT = 5, 0
           PARALLEL SEQUENTIAL =50 ASSISTING PARALLEL SEQT= 0
SNB401I -DB11 BUFFERPOOL NAME BP8KO, BUFFERPOOL ID 100, USE COUNT 2
         -DB11 BUFFER POOL SIZE = 1000 BUFFERS AUTOSIZE = NO
SNB402I
                                        TO BE DELETED =
            ALLOCATED = IN-USE/UPDATED =
                                  1000
                                  1000
                                                               1000
                                         BUFFERS ACTIVE =
         -DB11 PGFIX ATTRIBUTE -
            CURRENT = NO
            PENDING = NO
IEE612I CN=C01 DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```



Step 2 of 2

The information displayed as a result of issuing this command would usually be passed to the system programmer or DBA who may be required to modify the buffer pool attributes to resolve the issue.

If information is required for a specific buffer pool, then the -DB11 DISPLAY BUFFERPOOL(buffer pool name) command can be used. If information is required for all active and inactive buffer pools then the -DB11 DISPLAY BUFFERPOOL(*) command can be issued.

The highlighted messages displayed here show that there are a 1000 allocated buffers for buffer pool BP8K0 and that they all contain data.





```
DSNB402I -DB11 BUFFER POOL SIZE = 0 BUFFERS AUTOSIZE = NO
                ALLOCATED
                                               0 TO BE DELETED =
0 BUFFERS ACTIVE =
                                                   TO BE DELETED =
                IN-USE/UPDATED =
DSNB406I -DB11 PGFIX ATTRIBUTE -
                CURRENT = NO
PENDING = NO
              PAGE STEALING METHOD = LRU
 DSNB404I
             -DB11 THRESHOLDS -
               VP SEQUENTIAL = 80
               DEFERRED WRITE = 30 VERTICAL DEFERRED WRT = 5, 0
PARALLEL SEQUENTIAL =50 ASSISTING PARALLEL SEQT= 0
DSNB464I -DB11
 PAGE SET/PARTITION LIST INFORMATION
DATABASE SPACE NAME INST PART IX COUNT
 ----- ------ ---- ---- ----
DSNB463I -DB11 * * * NO OBJECTS MATCHED LIST/LSTATS SELECTION CRITERIA
DSNB468I -DB11 GBPDEP KEYWORD IS IGNORED FOR NON-DATA SHARING SYSTEMS DSN9022I -DB11 DSNB1CMD '-DISPLAY BUFFERPOOL' NORMAL COMPLETION
IEE612I CN=C01 DEVNUM=160 SYS=PROD
-db11 display utility(*)
IEE163I MODE= RD
```



Step 1 of 2

If you are responsible for running or monitoring Db2 utilities used for purposes such as reorganizing file structures, copying Db2 VSAM files or compressing table spaces or indexes, then the progress of these utilities can be tracked using the DISPLAY UTILITY command.

Type -DB11 DISPLAY UTILITY(*) and press Enter to display the status of all utility programs known to Db2.





```
-DB11 DISPLAY UTILITY(*)
DSNU100I -DB11 DSNUGDIS - USERID = GH2DBA

MEMBER = DB11

UTILID = REORG.SYSPKAGE
PROCESSING UTILITY STATEMENT 3

UTILITY = REORG
PHASE = RELOAD COUNT = 100689

NUMBER OF OBJECTS IN LIST = 1

LAST OBJECT STARTED = 1

STATUS = STOPPED

DSN9022I -DB11 DSNUGCCC '-DISPLAY UTILITY' NORMAL COMPLETION

IEE612I CN=C01 DEVNUM=160 SYS=PROD

IEE163I MODE= RD
```



Step 2 of 2

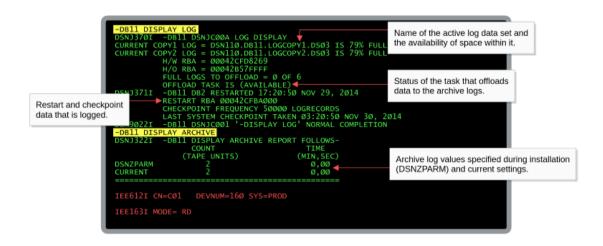
The information displayed here can assist you with monitoring the progress of the utility through the PHASE and COUNT details.

If there is a problem with the utility then it should be passed to the system programmer or DBA for further action or you may be required to delete the utility yourself using the -TERM UTILITY command.

In this example, the utility has stopped in the RELOAD phase.







The Db2 logs are important as they contain details of data changes and major events that occur. If you receive messages indicating that there is a problem with the logs, then the DISPLAY LOG or DISPLAY ARCHIVE commands may be of assistance.





```
H/W RBA = 00042CFD8269
H/O RBA = 00042B57FFFF
FULL LOGS TO OFFLOAD = 0 OF 6
DSNJ371I -DB11 DB2 RESTARTED 17:20:50 NOV 29, 2014
RESTART RBA 00042CFBA000
CHECKPOINT FREQUENCY 50000 LOGRECORDS
LAST SYSTEM CHECKPOINT TAKEN 03:20:50 NOV 30, 2014
DSNJ322I -DB11 DSNJC001 '-DISPLAY LOG' NORMAL COMPLETION
 DB11 DISPLAY ARCHIVE
 DSNJ322I -DB11 DISPLAY ARCHIVE REPORT FOLLOWS-
                        COUNT
                                                           TIME
                                                         (MIN,SEC)
0,00
                     (TAPE UNITS)
DSNZPARM
                                                             0,00
  _____
 ADDR STATUS CORR-ID VOLSER DATASET_NAME
NO ARCHIVE READ ACTIVITY
END OF DISPLAY ARCHIVE REPORT.
DSN9022I -DB11 DSNJC001 '-DISPLAY ARCHIVE' NORMAL COMPLETION
 TEE612I CN=C01 DEVNUM=160 SYS=PROD
 -db11 display thread(*)
IEE163I MODE= RD
```

.....

If you are attempting to stop Db2 but it is not complying, it may be that there are still some active threads. The DISPLAY THREADS command can be used to display active, inactive, indoubt, or postponed threads for a specified connection or all connections.

Type -DB11 DISPLAY THREAD(*) and press Enter to show the status and attributes of all threads.





Displaying Db2 Component Status > Displaying the Status of Threads

```
-DB11 DISPLAY THREAD(*)
DSNV401I -DB11 DISPLAY THREAD REPORT FOLLOWS -
DSNV402I - ACTIVE THREADS -
NAME ST A REQ ID
SERVER RA 144 [iava] [TS10977]
V437-WORKSTATION=9.28.121.100, USERID=TS10977,
APPLICATION NAME—java
V445-ACE181FE.F79E.00e330DF712E=13809 ACCESSING DATA FOR 9.28.121.100
SERVER RA * 144 java TS10977 DISTSERV 0029 30
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I - DSNVDT '-DIS THD' NORMAL COMPLETION

IEE612I CN=C01 DEVNUM=160 SYS=PROD

IEE613I MODE= RD
```

This field will normally display the plan name associated with the thread but because this thread is using application-directed access from a non-Db2 requester, DISTSERV is displayed.

The results from this command can be varied showing threads with a number of different statuses.

Mouse-over the details shown here for an explanation of that message.





You can display a list of active DB2 threads.

You can track the status of any utilities running within DB2.

You can display the status and attributes of the current active log and archive log.



You can identify the attributes of buffer pools that have been defined to DB2.

In this section you have been introduced to a number of Db2 commands that can be used to gather information about Db2 activity and connectivity. This information in turn may be able to assist you in diagnosing and resolving Db2 operational problems, or may be escalated to a specialist for further investigation.





How do you terminate a utility that is running?

Which buffer pool defaults can you modify?

Why would you need to cancel a thread, and what command is used to perform this task?



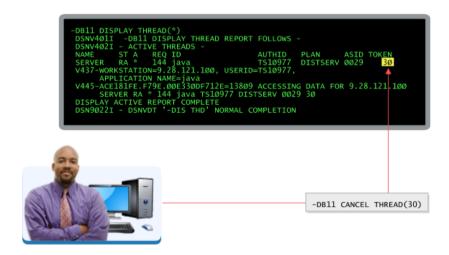
Which commands can you use to control logging?

This section introduces you to some of the Db2 commands you may be expected to invoke if it is your responsibility to diagnose Db2 messages or enter Db2 commands at the request of the DBA or system programmer. The commands focus on the Db2 components discussed previously in this module.





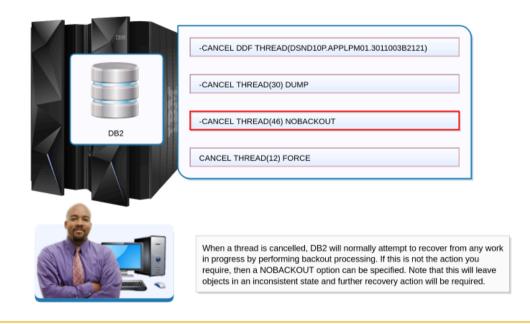




If an active or suspended thread needs to be removed from Db2 processing, the -CANCEL THREAD command can be issued. To invoke this command you will need to know the token for the thread, which is displayed when entering the -DISPLAY THREAD command.





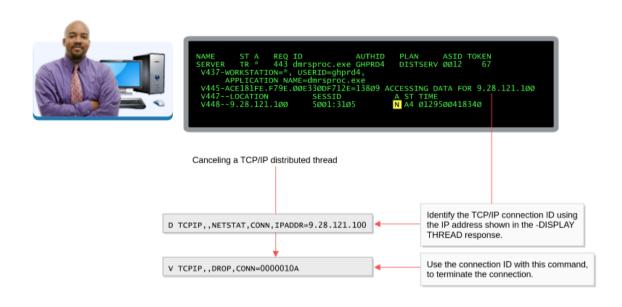


Several variations to the -CANCEL THREAD command can be issued depending on the type of thread, the output you want produced and the action to be taken by the thread as a result of the cancel command.

Mouse-over the commands above for a description of their purpose.





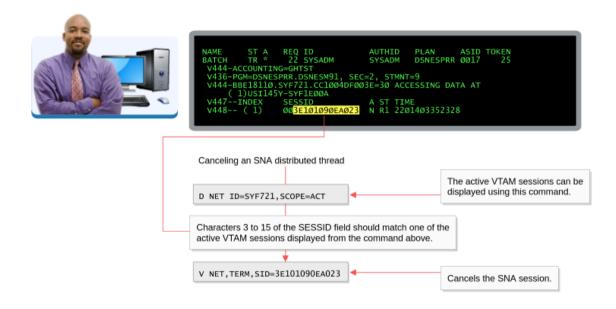


If the thread becomes hung within the network then you may need to cancel the thread using a VTAM or TCP/IP command. In the display shown here, the highlighted N, indicates that the conversation is active in the network.





Resolving Db2 Operational Problems > Canceling Threads from SNA



A similar process is used to cancel an SNA distributed thread.





Resolving Db2 Operational Problems > Terminating a Db2 Utility



If an active utility needs to be terminated, either because it has stopped processing, is running longer than is acceptable or needs to be removed to allow for recovery activity, then the -TERM UTILITY(utility ID) command can be issued. All utilities can be terminated using the -TERM UTILITY(*) command.

In this example, the RUNSTATS utility was found to be stopped when the request to terminate was issued.





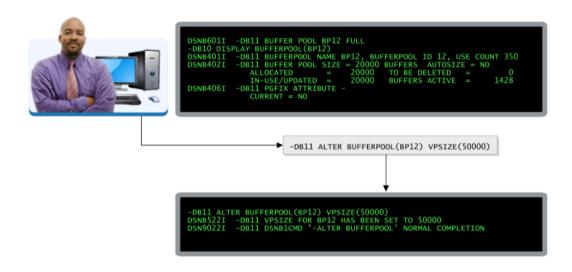


Temporary modifications, such as changing the frequency of checkpoints and suspending logging activity, can be made to the log using the -SET LOG command. These changes will only remain until a Db2 restart is performed or another -SET LOG command is issued to override the change.

Mouse-over the commands for an example of their purpose.







If performance statistics indicate an issue with buffer pools or an error message indicates a problem with this resource, you may be instructed to alter the attributes of buffer pools.

The VPSIZE option displayed here is used to change the size of the buffer pool. If a buffer pool needs to be deleted altogether, then the buffer pool size can be set to zero, which will quiesce activity to it and then delete it. Many of the other buffer pool attributes that can be modified will most likely be managed by your Db2 performance and tuning team.







I can cancel a thread that is hung or has stopped.

I can increase the size of a buffer pool.

I can use the -TERM UTILITY command to terminate an active utility.



I can stop and start logging and modify the logging checkpoint attributes.

In this section you have been introduced to several scenarios where the operator needs to enter Db2 commands to resolve problems. Many of these commands require that you are issuing them from a source that has appropriate authority.

