Monitoring and Resolving Db2 Operational Problems

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:

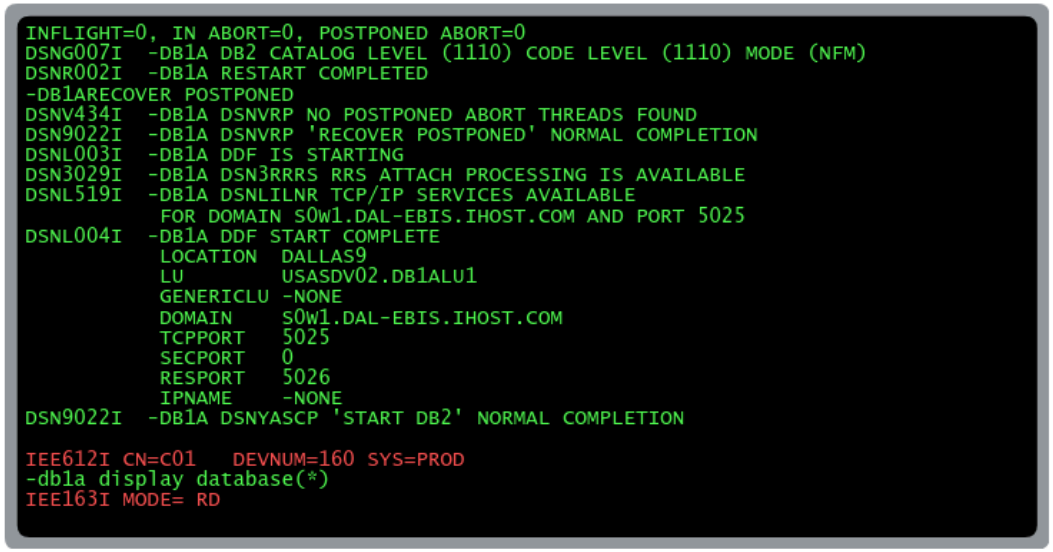
- Display the Status and Attributes of Databases, Buffer Pools, Logs, Utilities and Threads
- Start and Stop Db2 Databases
- Modify Attributes Associated With Buffer Pools, Logs, Utilities and Threads

How can you display the status of DB2 database components?

Which DB2 commands can be used to stop a database?

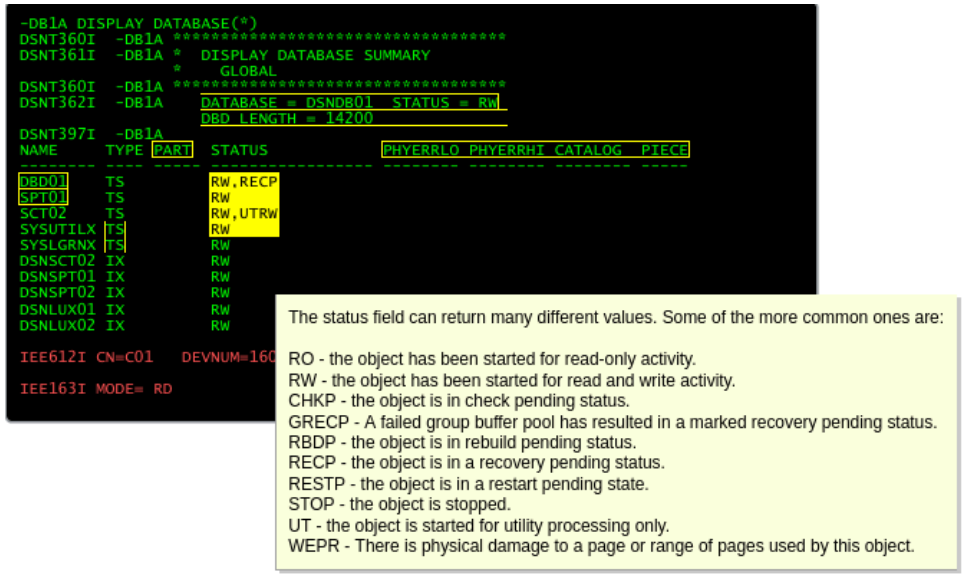
How do you start a database?

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.



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.

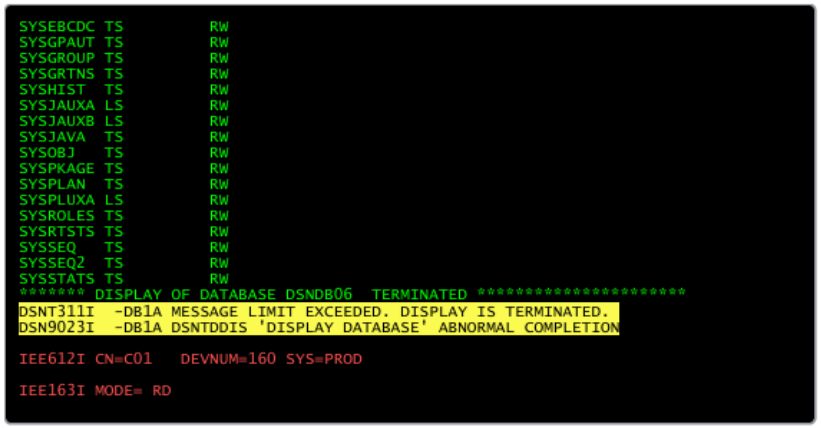
Type **-DB1A DISPLAY DATABASE(*)** and **press** **Enter** to display details of all databases associated with the DB1A Db2 subsystem.



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.



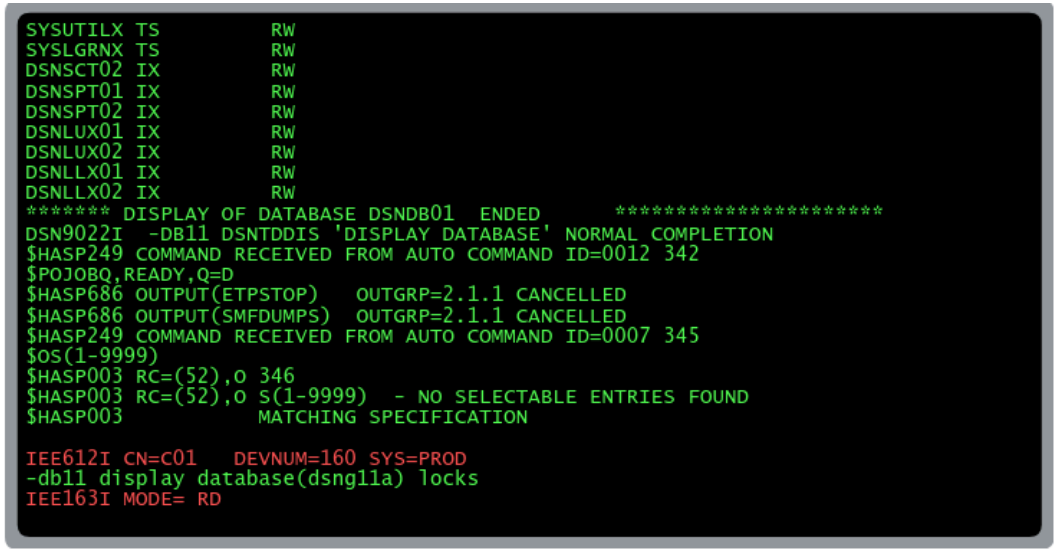
As the response to this command scrolls through, the highlighted messages indicate that the number of messages created has exceeded a defined maximum.

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.

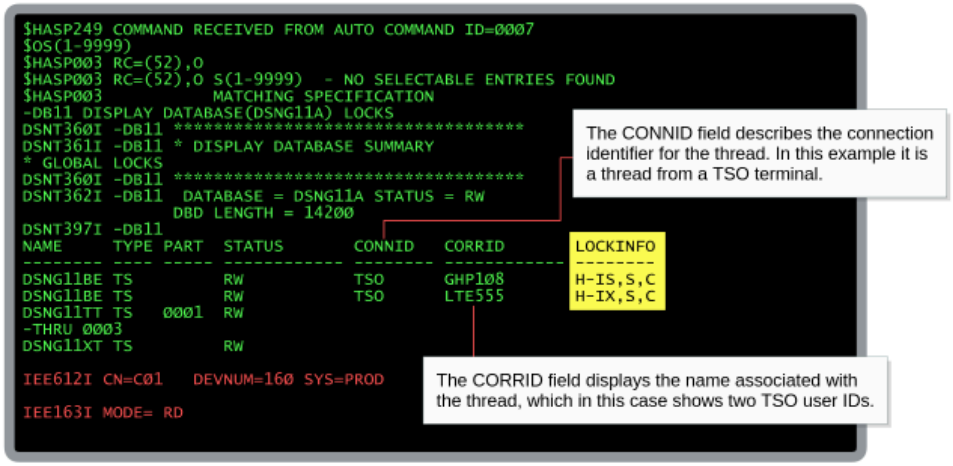
A number of variations can be specified with the DISPLAY DATABASE command that allows you to view more specific information.

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



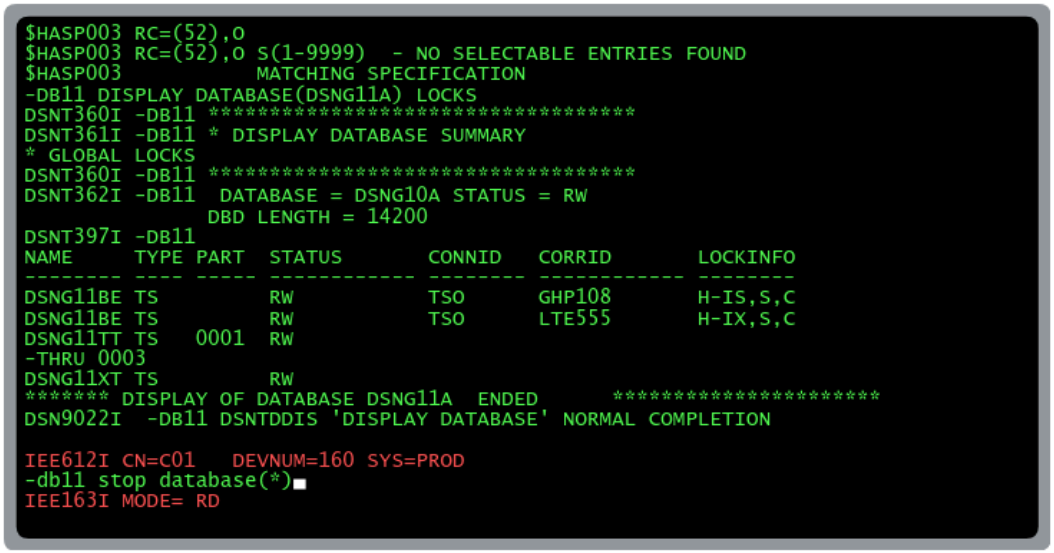
Another useful option that can be specified on the -DISPLAY DATABASE command is the LOCKS option. If a problem has occurred where access to a particular table space or index space is not possible because another entity has locked it for use, then this option will display details relating to that lock.

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



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:

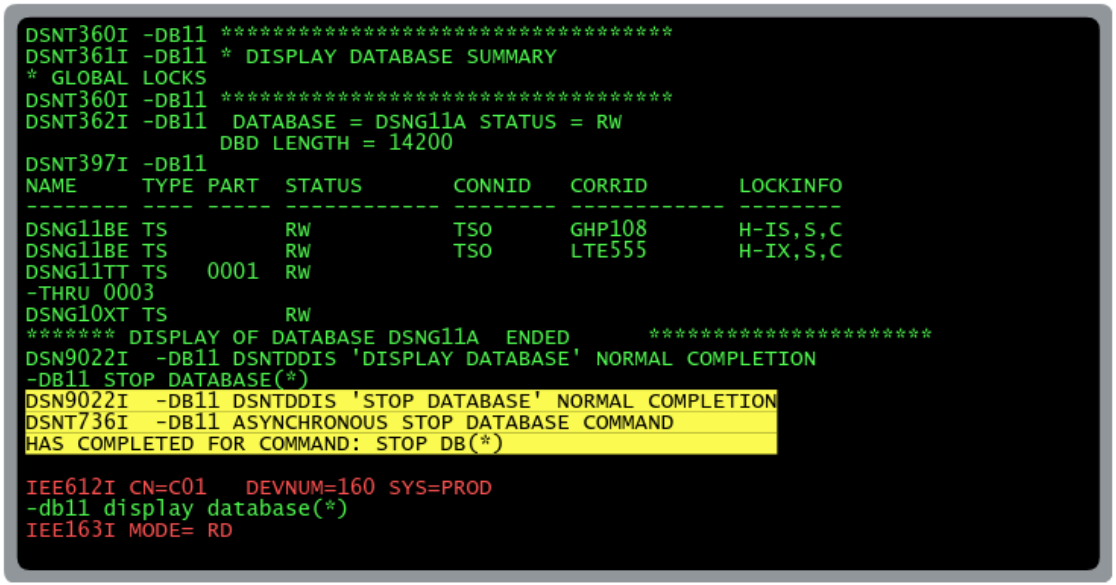
H - the lock is held by the agent or the Db2 member.
IS - it is a lock with read intentions. IX is a lock with update intentions.
S - the lock type is a table space logical lock.
C - the lock is freed at commit time.



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.



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
NAME     TYPE PART  STATUS            PHYERRLO PHYERRHI CATALOG  PIECE
-------- ---- ----- ----------------- -------- -------- -------- -----
DSN32K00 TS         RW
DSN4K00  TS         RW
******* DISPLAY OF DATABASE DSNDB07  ENDED      **********************
DSNT360I  -DB11 ***********************************
DSNT362I  -DB11     DATABASE = ADBDCH  STATUS = STOP
                  DBD LENGTH = 8066
DSNT397I  -DB11
NAME     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).

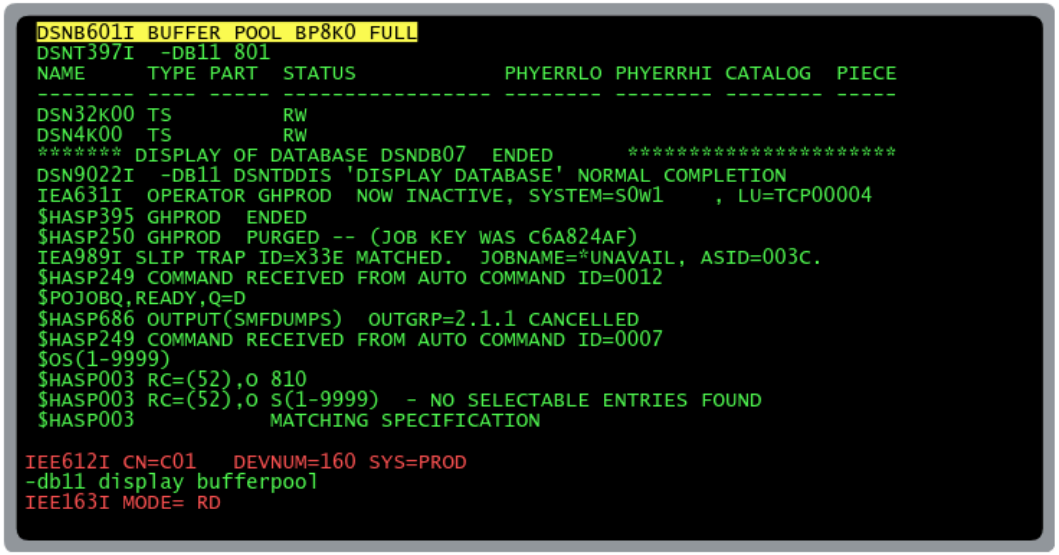
```
DSNJ016E DB11 DSNDB04 WARNING -SYSTEM CHECKPOINT PROCESSOR MAY
HAVE STALLED. LAST CHECKPOINT WAS TAKEN 11.022 14:06:23
```

```
DSNU060I DB11 DSNUGMAP - USER GH557 NOT AUTHORIZED
FOR LOAD UTILITY ON DATABASE DSN0001D
```

```
DSNB601I BUFFER POOL BP8K0 FULL
```

```
DSNJ317I ARCHIVE LOG QUIESCE PERIOD EXPIRED.
NUMBER OF OUTSTANDING UR'S = 1.  ARCHIVE LOG PROCESSING WILL BE
TERMINATED, AND UPDATE ACTIVITY AGAINST DB2 RESOURCES WILL BE
RESUMED.  13:30:04
```

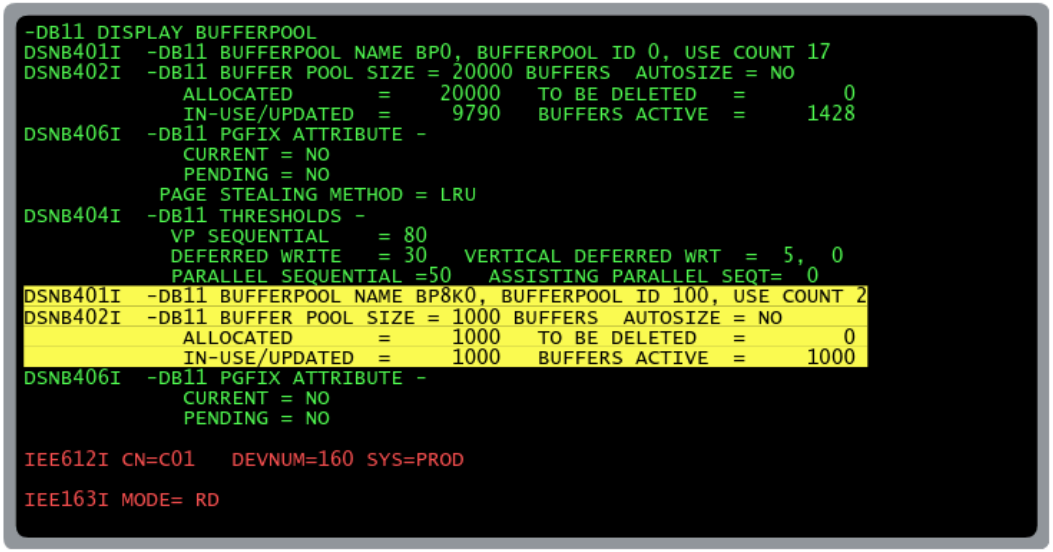
In this section you will look at a number of Db2 display commands that can assist you in obtaining Db2 component or object status and attribute details. This information can then be used to assist you in resolving a Db2 problem or might be required when escalating a problem to a Db2 specialist.



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.

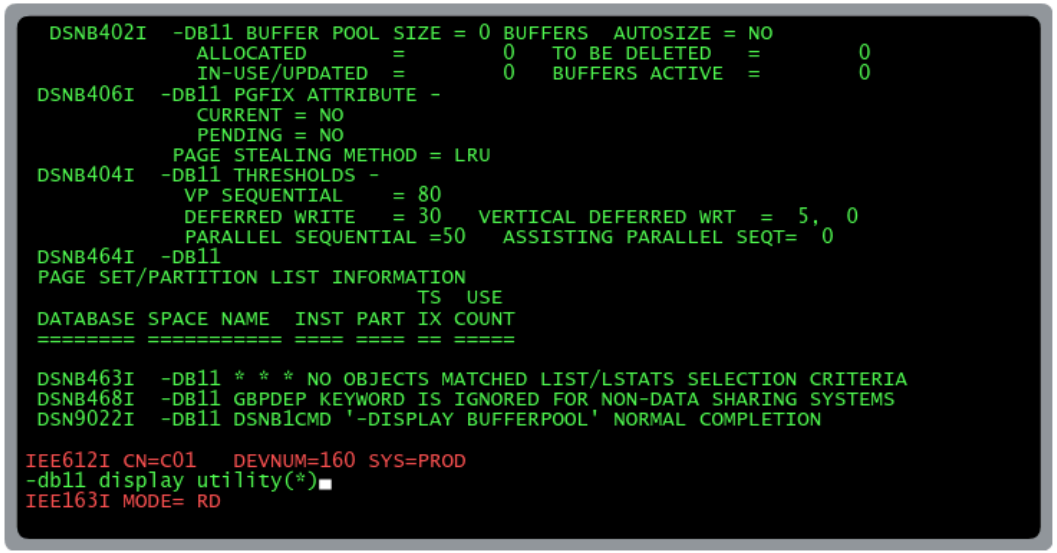


Step 2 of 2

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.

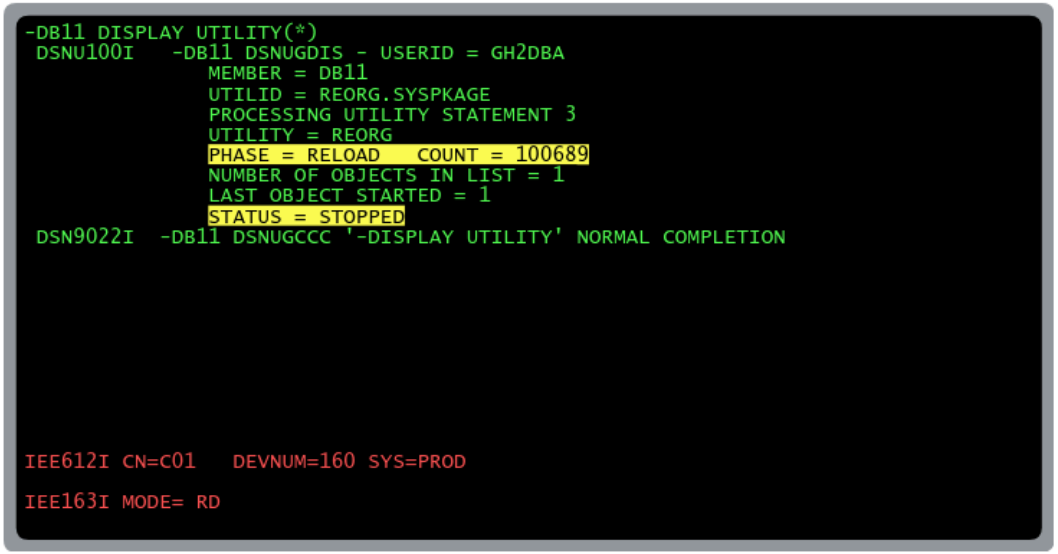
The highlighted messages displayed here show that there are a 1000 allocated buffers for buffer pool BP8K0 and that they all contain data.



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.

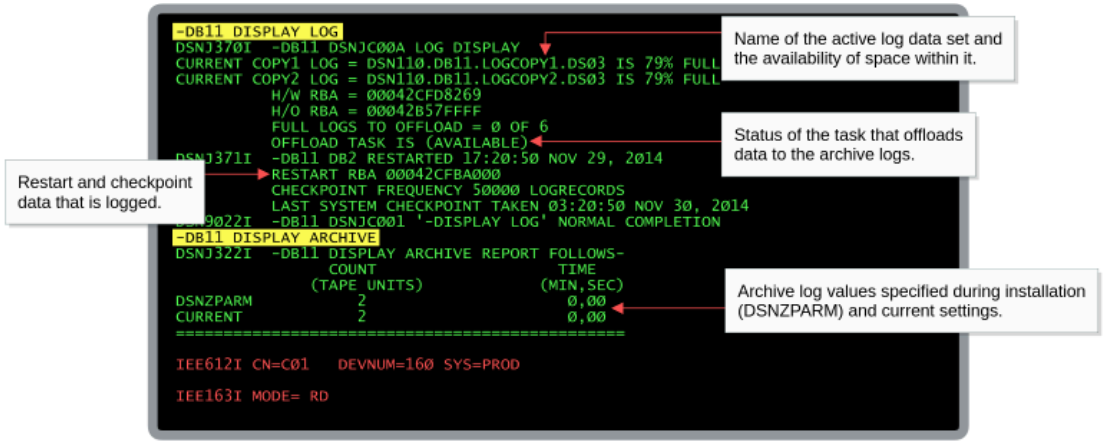


Step 2 of 2

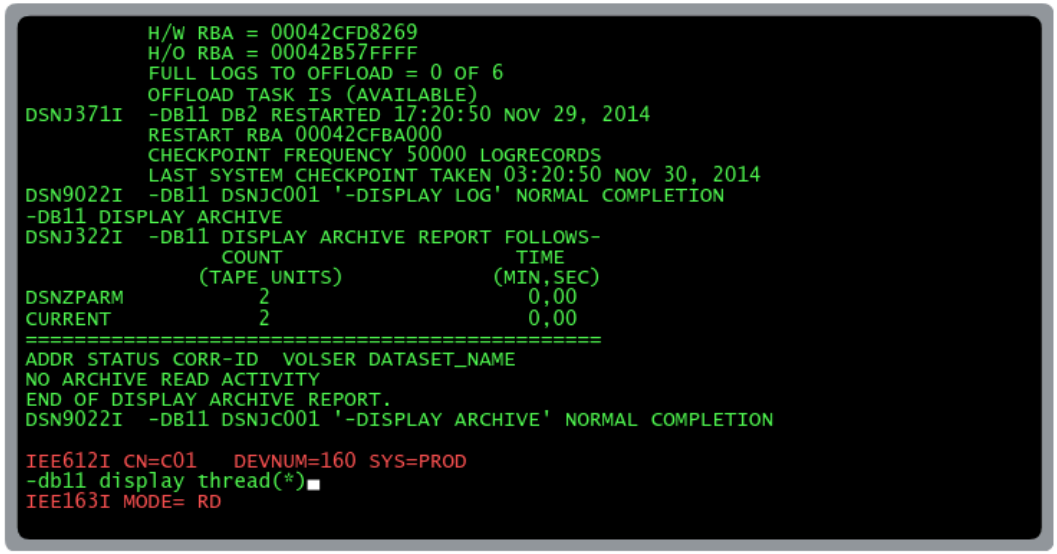
The information displayed here can assist you with monitoring the progress of the utility through the PHASE and COUNT details.

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.



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.

```
-DB11 DISPLAY THREAD(*)
 DSNV401I  -DB11 DISPLAY THREAD REPORT FOLLOWS -
 DSNV402I - ACTIVE THREADS -
 NAME     ST A   REQ ID              AUTHID   PLAN     ASID TOKEN
 SERVER   RA *   144 java            TS10977  DISTSERV 0029   30
 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

IEE163I 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.

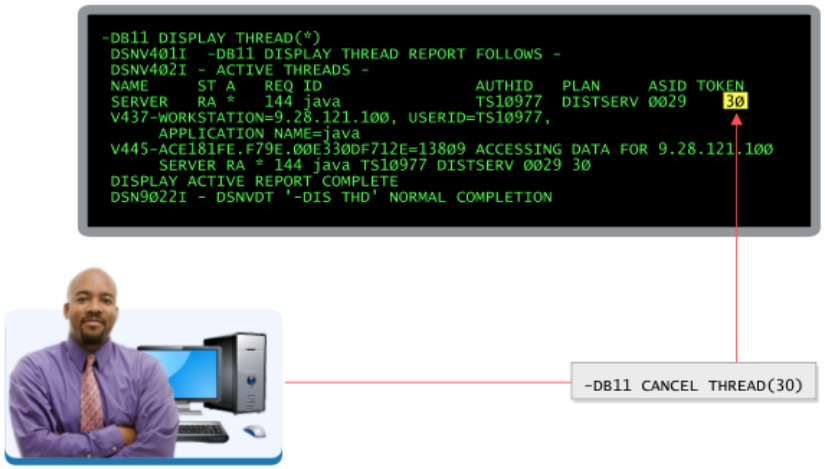
How do you terminate a utility that is running?

Which buffer pool defaults can you modify?

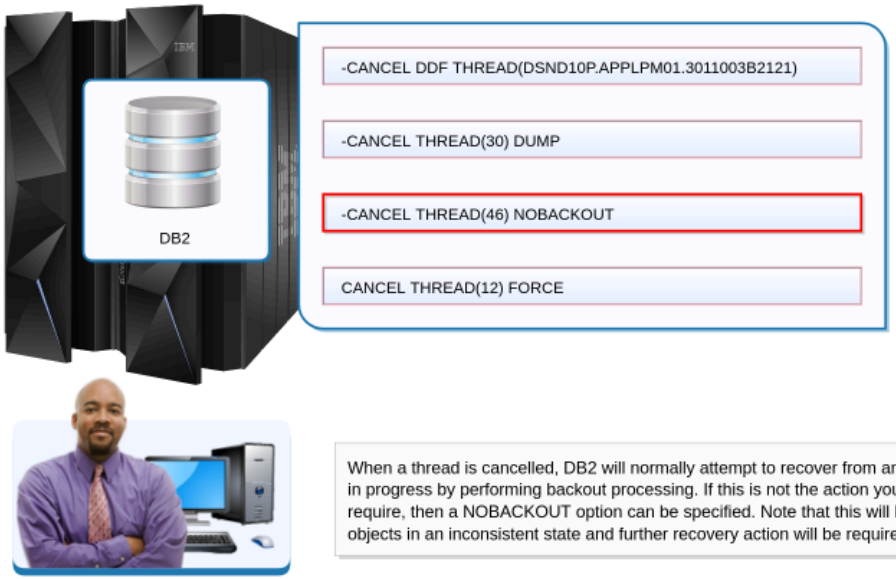
Why would you need to cancel a thread, and what command is used to perform this task?

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.

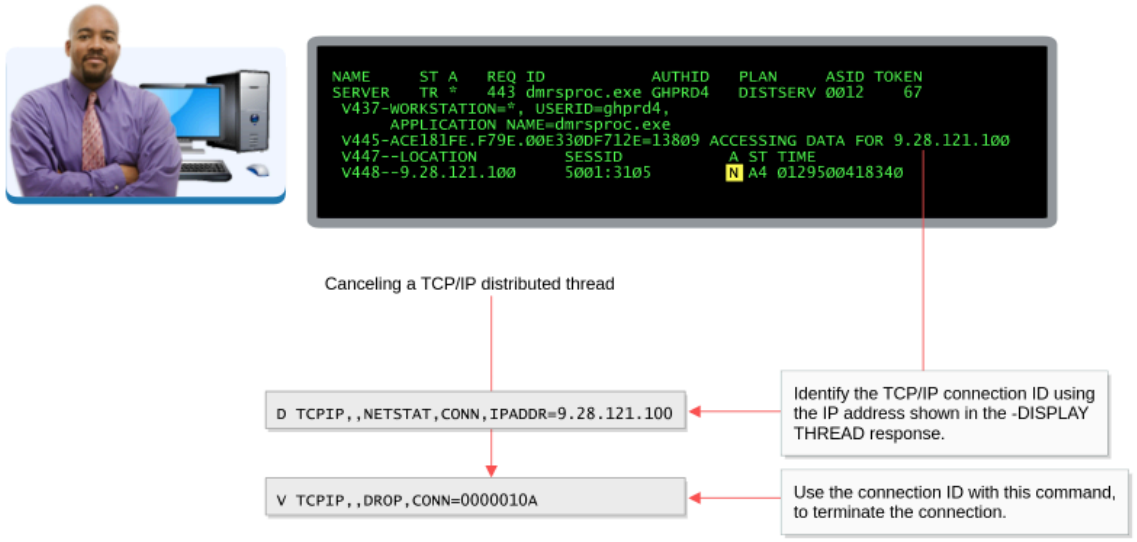


If an active or suspended thread needs to be removed from Db2 processing, the -CANCEL THREAD command can be issued. To invoke this command you will need to know the token for the thread, which is displayed when entering the -DISPLAY THREAD command.

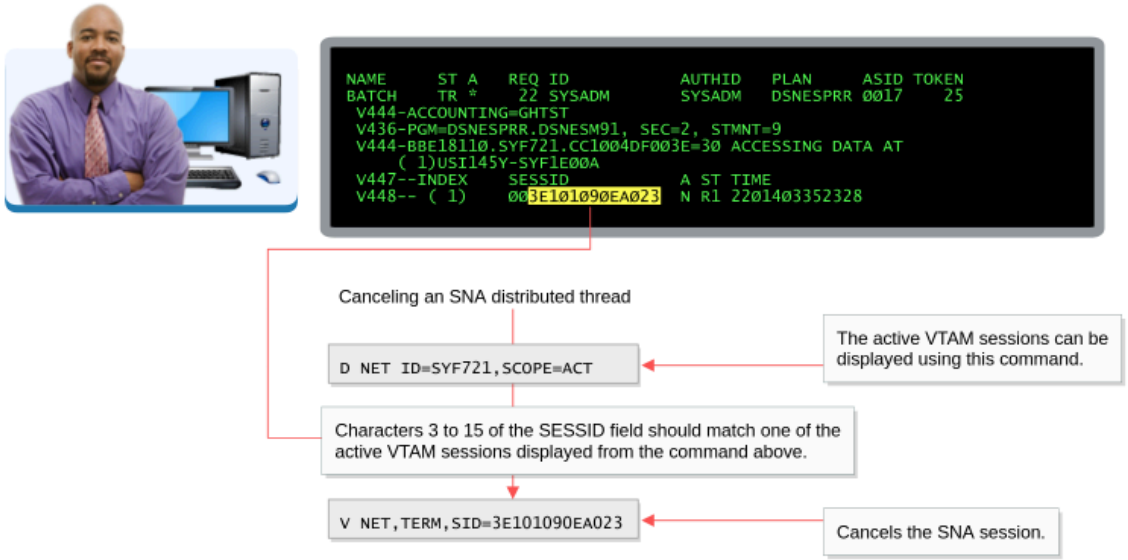


Several variations to the -CANCEL THREAD command can be issued depending on the type of thread, the output you want produced and the action to be taken by the thread as a result of the cancel command.

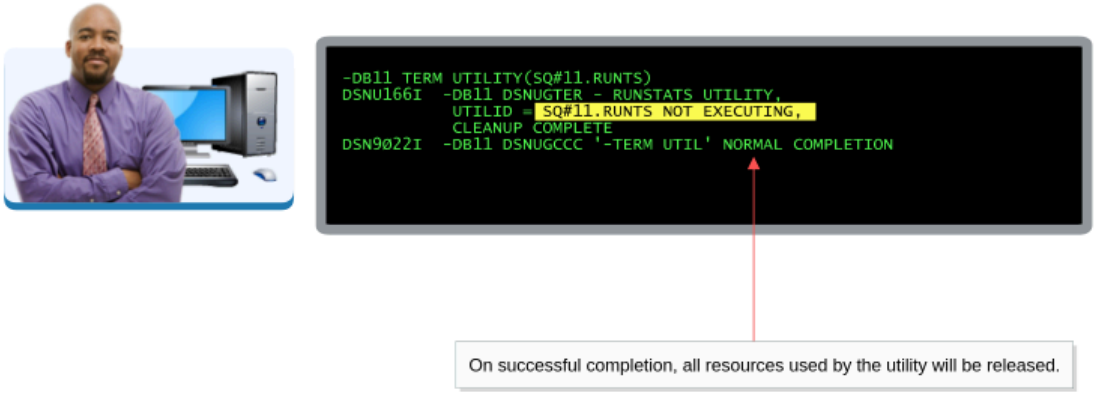
Mouse-over the commands above for a description of their purpose.



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.

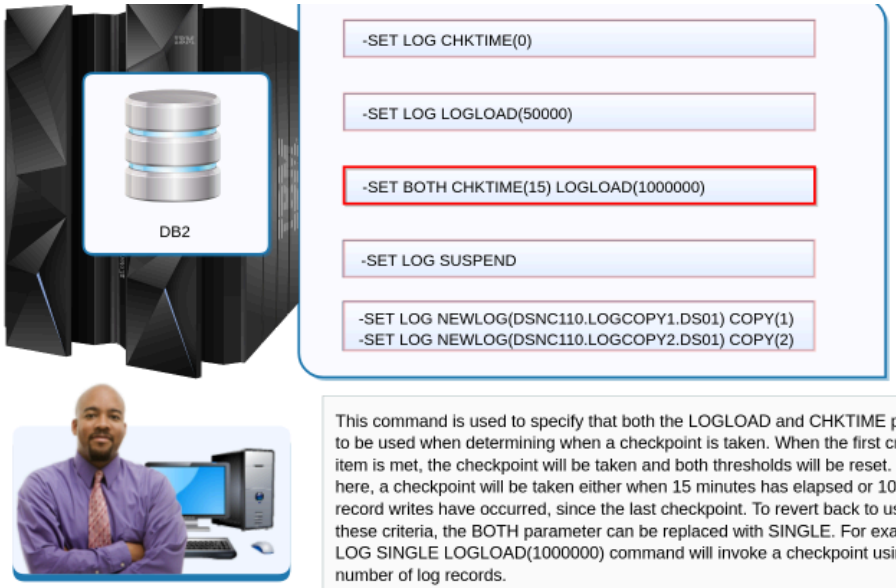


A similar process is used to cancel an SNA distributed thread.



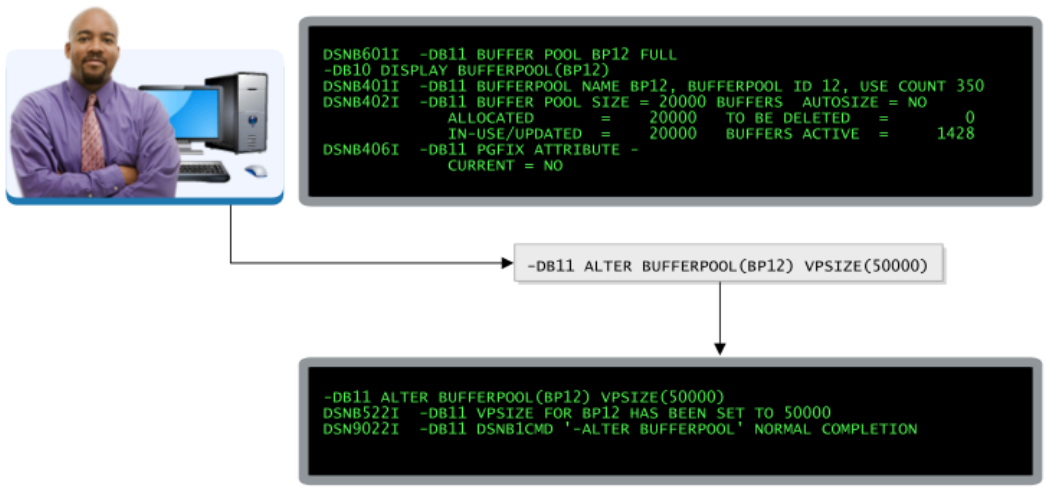
If an active utility needs to be terminated, either because it has stopped processing, is running longer than is acceptable or needs to be removed to allow for recovery activity, then the -TERM UTILITY(utility ID) command can be issued. All utilities can be terminated using the -TERM UTILITY(*) command.

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.