



General Db2 Operations

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Objectives

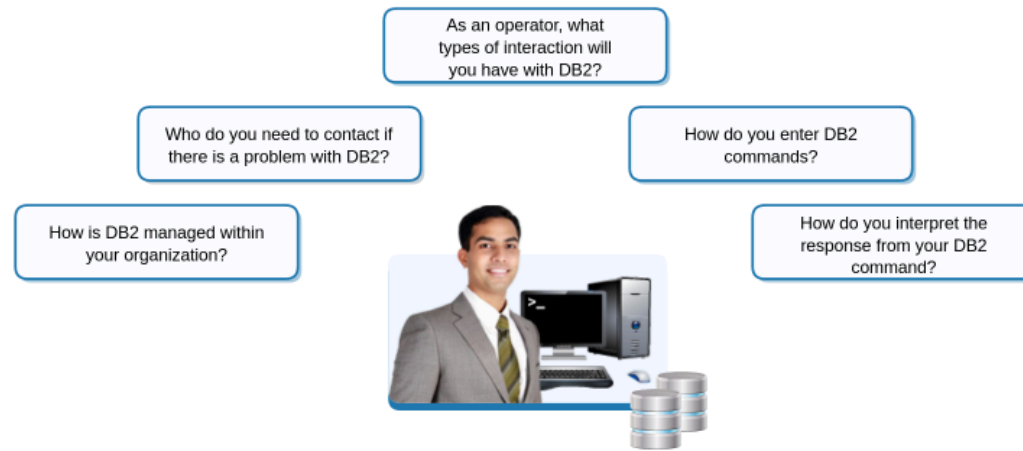
General Db2 Operations

In this module, you will take a brief look at the people in your organization that use Db2 and how the product itself is implemented and managed. Common tasks associated with the operations aspects of Db2 are presented, which leads into the syntax of Db2 operator commands and the interpretation of resulting output.

Finally, the commands used to start and stop Db2 are discussed along with several operational scenarios.

After completing this module, you will be able to:

- Identify How Db2 is Managed within the Organization
- Enter Db2 Commands and Interpret Responses
- Start and Stop Db2

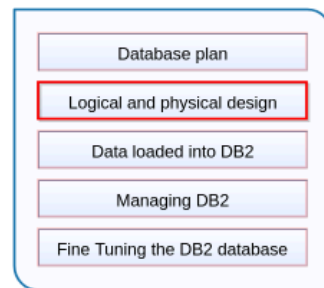


This section provides you with a broad overview of Db2 and how it may be used within your organization, describing the people that interact with it and how it is managed. It also focuses on the operational tasks associated with Db2 and the syntax of general operator commands.



If a problem occurs with Db2, it may be your responsibility to identify the person it is escalated to, so it is important to understand the functions performed by IT personnel who interact with Db2.

Mouse-over the people above for a description on how they use Db2.

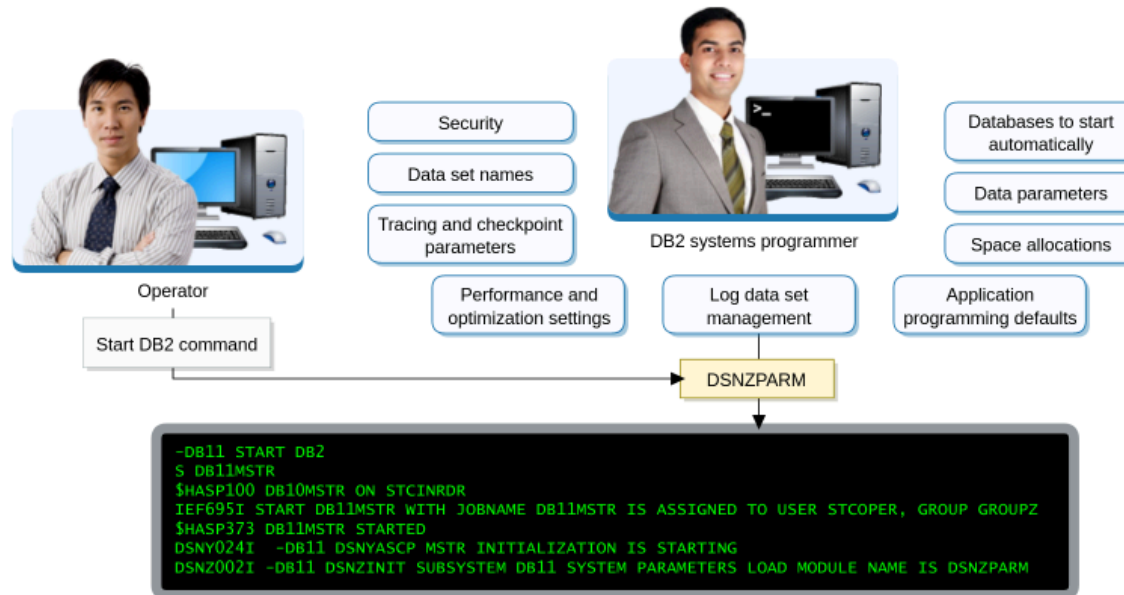


A logical model of the database is created starting with the identification of database entities, primary keys, the relationship between entities and the attributes associated with the entities. The physical design is the creation of required tables, table spaces and indexes. The attributes associated with DB2 components such as storage groups and buffer pools are defined and the identification and creation of stored procedures is undertaken.

Before discussing your role as a Db2 operator, you need to be aware of how it is implemented and managed within your organization. This may assist you at a later stage if you encounter a Db2 problem during startup or shutdown and need to diagnose and escalate it.

The picture displayed here shows the general phases associated with implementing and managing Db2.

Mouse-over the processes for more information.



As part of the Db2 implementation process, the database administrator or Db2 systems programmer will have created a load module, which contains Db2 subsystem parameters. These parameters are used during Db2 startup to define subsystem characteristics.

The default name of this load module is DSNZPARM.



```

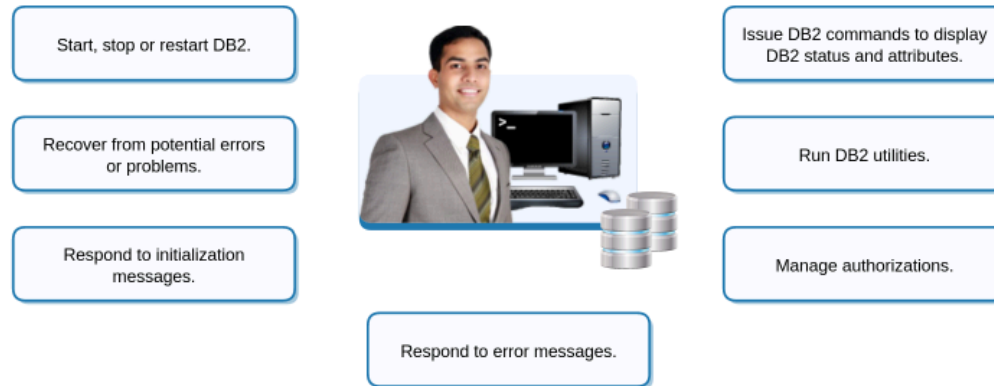
Display Filter View Print Options Search Help
-----
SDSF DA S0w1      S0w1      PAG 3 CPU 6          LINE 1-5 (5)
COMMAND INPUT ==>
SCROLL ==> CSR
NP  JOBNAME StepName ProcStep JobID  Owner  C      Pos DP Real Paging A
DB11IRLM DB11IRLM      STC04727 STCOPER      NS  FE 3020 1.11
DB11DBM1 DB11DBM1      IEFPROC  STC04728 STCOPER      NS  FE 48T  1.48
DB11MSTR DB11MSTR      IEFPROC  STC04726 STCOPER      NS  FE 2560 0.16
DB11DIST DB11DIST      IEFPROC  STC04729 STCOPER      NS  FE 4195 0.01
DB11ADMT DB11ADMT      STARTADM STC04730 STCOPER      IN  C1 2394 0.23

```

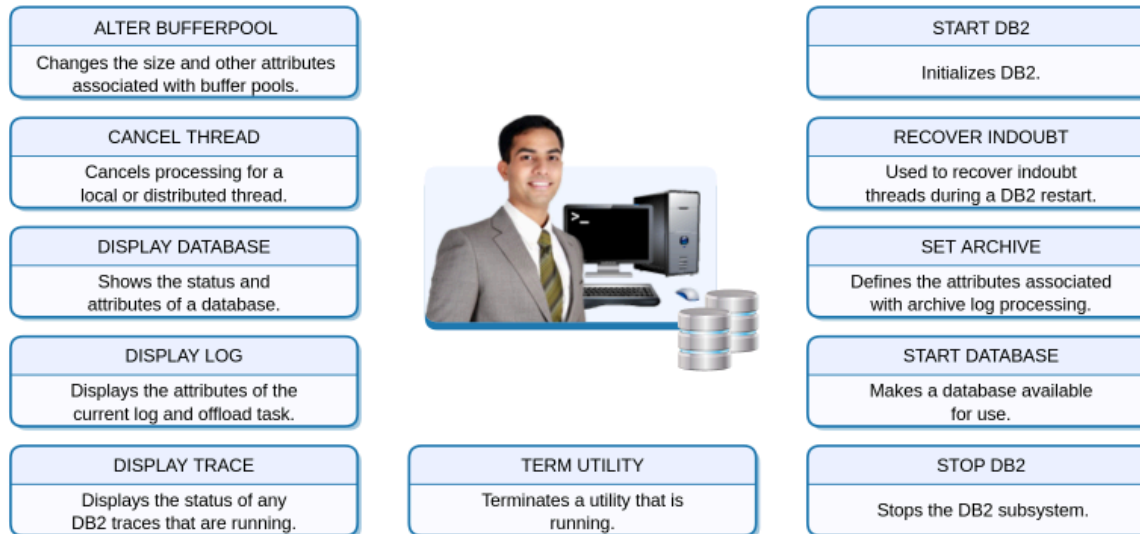
This address space handles the majority of database related services.

When the start Db2 command is issued, a number of Db2 address spaces may be started. The system services address space (MSTR) and database services address space (DBM1) will always be started, while others shown here are dependent on subsystem parameter settings.

Mouse-over the Db2 address spaces above, shown here in the SDSF Display Active panel, for a description of their purpose.



The information discussed so far has provided details on what to expect when Db2 is started. Once this has occurred it will generally be the responsibility of the operator to monitor the product and perform initial problem diagnosis should it be required.



If you have been assigned appropriate access there are a number of Db2 commands used to assist you with the day-to-day operation and monitoring of Db2.



```

Display Filter View Print Options Search Help
-----
SDSF DA S0W1      S0W1      PAG 3 CPU 6          LINE 1-5 (5)
COMMAND INPUT ==>> /-db11 stop db2          SCROLL ==>> CSR
NP  JOBNAME StepName ProcStep JobID  Owner  C      Pos DP Real Paging A
DB11IRLM DB11IRLM          STC04727 STCOPER          NS FE 3020 1.11
DB11DBM1 DB11DBM1 IEFPROC STC04728 STCOPER          NS FE 487 1.48
DB11MSTR DB11MSTR IEFPROC STC04726 STCOPER          NS FE 2560 0.16
DB11DIST DB11DIST IEFPROC STC04729 STCOPER          NS FE 4195 0.01
DB11ADMT DB11ADMT STARTADM STC04730 STCOPER          IN CL 2394 0.23

```



```

==>>
DB2 COMMANDS          SSID: DB11

Position cursor on the command line you want to execute and press ENTER

Cmd 1 ==>> -DISPLAY DATABASE(*)
Cmd 2 ==>>
Cmd 3 ==>>
      .>>>
Cmd 4 ==>>
      .>>>
Cmd 5 ==>>
      .>>>
      .>>>
Cmd 6 ==>>
      .>>>
      .>>>
Cmd 7 ==>>
      .>>>
      .>>>
      .>>>

PRESS: ENTER to process  END to save and exit  HELP for more information

```

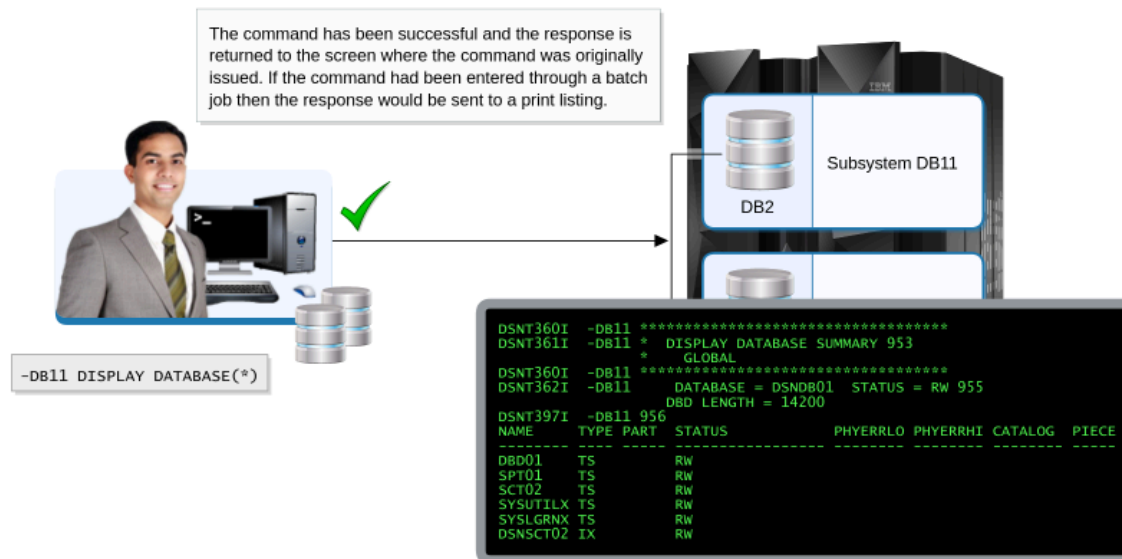
```

IEE612I CN=C01  DEVNUM=160 SYS=PROD
-DB11 START DB2
IEE163I MODE= RD

```

Db2 commands can be entered from a number of different sources, such as: a z/OS console, z/OS application program, APF authorized programs such as SDSF, IMS terminal/program, a DB2I panel, CICS terminal or IFI application program.

Note that not all commands can be entered from all the sources mentioned above as they require higher authority.



You have probably noticed with the Db2 commands displayed in this module that they are prefixed with a hyphen (-). This character is often used as the default prefix character.

If you have multiple Db2 subsystems, commands need to be further qualified so that the command is sent to the correct subsystem. In this scenario a command prefix in the form of a one to eight character subsystem name needs to be added.

Press the **Play** button for an example of the prefix required when entering Db2 commands.

These three characters are the unique message number within the subcomponent.

```
DSN#209I - DB2A DSNB1RTR - BUFFER MANAGER  
TABLESPACE/INDEXSPACE  
CLEANUP ROUTINE (DSNB1CFC)  
HAS BEEN SCHEDULED FOR  
DBNAME=GA7AGPBG  
SPACENAME=GA7A082A  
PSID=X'01400F8'
```

The first three characters are DSN signifying that it is a DB2 message.

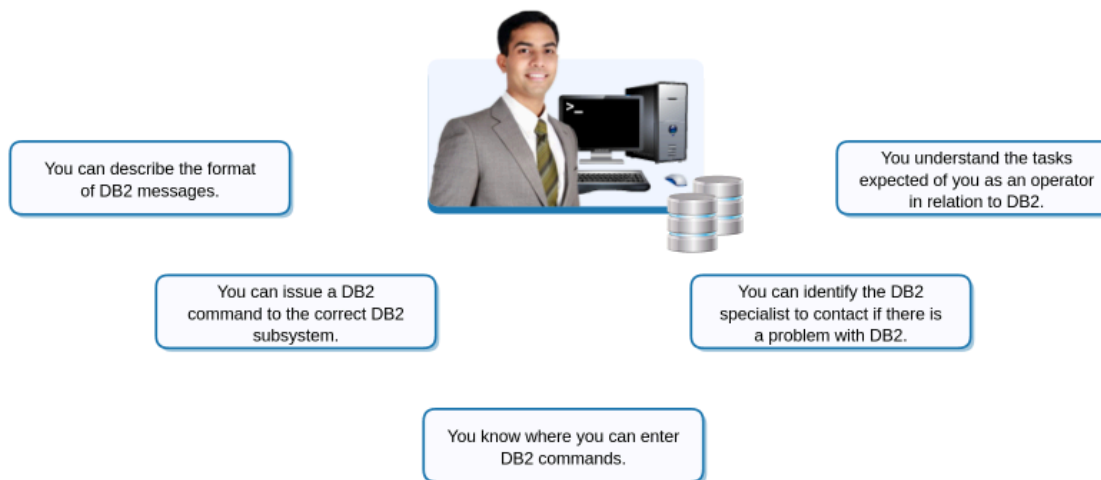
The last character indicates the importance of the message. In these examples, I represents an informational message.

```
DSNR00I -DB2X RESTART COMPLETED
```

This character identifies the DB2 subcomponent that issued it. In this case R represents the Recovery Manager.



Whether you are looking at messages produced from executing SQL, Db2 initialization messages or responses to Db2 commands, Db2 produces a unique message using the format displayed here.



In this section you have seen the processes and the people associated with implementing, managing and fine-tuning the Db2 database. You also looked at the types of tasks performed by the operator, identified how Db2 commands are issued and how to interpret Db2 responses.

```
IEE252I MEMBER IEFSSNAT FOUND IN SYS1.PARMLIB
IEE538I CTICBR00 MEMBER NOT FOUND IN PARMLIB
CBR7320I The SYSOAM component trace has been initialized successfully
without the CTICBR00 parmlib member.
CBR8001I OAM1 subsystem initialization starting.
CBR8007I No DB2 SSID or the DB2 SSID value of "NONE" has been specified.
  OTIS subsystem cannot successfully initialize.
CBR8002I OAM1 subsystem initialization completed.
IEE252I MEMBER IEFSSNDB FOUND IN SVTSC.PARMLIB
DSN3100I -DB1A DSN3UR00 - SUBSYSTEM DB1A READY FOR START COMMAND
IEE252I MEMBER IEFSSN66 FOUND IN SVTSC.PARMLIB
IEE252I MEMBER DFHSSI66 FOUND IN SVTSC.PARMLIB
DFH0100 CICS subsystem is now initialized
IEF196I DFH0100 CICS subsystem is now initialized
IEE389I MVS COMMAND PROCESSING AVAILABLE
ISG359I GRS EXIT CACHE WAS CREATED SUCCESSFULLY
IEE677I 16.41.59 MPF DISPLAY 433
MESSAGE SUPPRESSION AND USER EXITS INACTIVE - NOT INITIALIZED
GENERAL WTO USER EXIT (IEAVMXIT) INACTIVE
  SUBSYSTEMS RECEIVING FOREIGN MESSAGES AND DOMS:

IEE612I CN=C01   DEVNUM=160 SYS=PROD
-start db2
IEE163I MODE= RD
```



When your system is IPLed, the message highlighted here will be displayed indicating that a start command can be issued for your Db2 subsystem. The operator or other authorized user must enter the start command to make Db2 operational.

Type -START DB2 command into the input field and **press Enter** to start the Db2 subsystem.



```
-START DB2
S DBIAMSTR
$HASP100 DBIAMSTR ON STCINRDR
IEF695I START DBIAMSTR WITH JOBNAME
GROUP GROUPZ
$HASP373 DBIAMSTR STARTED
DSNY024I -DB1A DSNYASCP MSTR INITI
DSNZ002I -DB1A DSNZINIT SUBSYSTEM DB1A SYSTEM PARAMETERS LOAD MODULE
NAME IS DSNZPARM
DSNZ016I -DB1A DSNZINIT
SUBSYSTEM DB1A SYSTEM PARAMETERS ARE AS FOLLOWS:
SYSTEM PARM DSN110.DB1A.SDSNEXIT(DB1APARM)
DSNHDECP DSN110.DB1A.SDSNEXIT(DSNHDECP)
ACCESS EXIT DSN110.DB1A.SDSNEXIT(DSNX@XAC)
IDAUTH EXIT DSN110.DB1A.SDSNEXIT(DSN3@ATH)
SIGNON EXIT DSN110.DB1A.SDSNEXIT(DSN3@SGN)
DSN7407I -DB1A DSN7GAR1
AUTOMATIC RESTART MANAGER REGISTER FAILED.
MVS IXCARM RETURN CODE = 0000000C,
MVS IXCARM REASON CODE = 00000160.

IEE612I CN=C01 DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

The MSTR address space responsible for DB2 system related functions is started.

The DB2 subsystem DB1A is being started using the system parameters stored in the DSNZPARM load module.

Several screens of Db2 related messages are displayed as a result of Db2 starting.



```
S DB1AIRLM
$HASP100 DB1AIRLM ON STCINRDR
IEF695I START DB1AIRLM WITH JOBNAME DB1AIRLM IS ASSIGNED TO USER STCOPER
, GROUP GROUPZ
$HASP373 DB1AIRLM STARTED
DXR180I DJ1A001 AUTOMATIC RESTART MANAGER IS NOT ENABLED
DXR117I DJ1A001 INITIALIZATION COMPLETE
DSNY001I -DB1A SUBSYSTEM STARTING
DSNJ127I -DB1A SYSTEM TIMESTAMP FOR BSDS= 14.022 11:24:57.17
DSNJ001I -DB1A DSNJW007 CURRENT COPY 1 ACTIVE LOG
DATA SET IS DSNNAME=DSN110.DB1A.LOGCOPY1.DS03,
STARTRBA=00042B580000,ENDRBA=00042D73FFFF
DSNJ001I -DB1A DSNJW007 CURRENT COPY 2 ACTIVE LOG
DATA SET IS DSNNAME=DSN110.DB1A.LOGCOPY2.DS03,
STARTRBA=00042B580000,ENDRBA=00042D73FFFF
DSNJ099I -DB1A LOG RECORDING TO COMMENCE WITH
STARTRBA=00042C220000
S DB1ADB1
$HASP100 DB1ADB1 ON STCINRDR
IEF695I START DB1ADB1 WITH JOBNAME DB1ADB1 IS ASSIGNED TO USER STCOPER

IEE612I CN=C01   DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

The IRLM address space responsible for data locking is started.

The log manager is being initialized.

The DBM1 address space responsible for database services is started.

The following Db2 startup messages continue to scroll during startup.





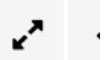
```
$HASP373 DB1ADB1 STARTED
DSNY024I -DB1A DSNYASCP DBM1 INITIALIZATION IS STARTING
S DB1ADIST
$HASP100 DB1ADIST ON STCINRDR
IEF695I START DB1ADIST WITH JOBNAME DB1ADIST IS ASSIGNED TO USER STCOPER
, GROUP GROUPZ
$HASP373 DB1ADIST STARTED
DSNY024I -DB1A DSNYASCP DIST INITIALIZATION IS STARTING
DSNR001I -DB1A RESTART INITIATED
DSNR003I -DB1A RESTART..PRIOR CHECKPOINT RBA=00042C2139DF
DSNR004I -DB1A RESTART..UR STATUS COUNTS
IN COMMIT=0, INDOUBT=0, INFLIGHT=0, IN ABORT=0, POSTPONED ABORT=0
DSNR005I -DB1A RESTART..COUNTS AFTER FORWARD RECOVERY
IN COMMIT=0, INDOUBT=0
DSNR006I -DB1A RESTART..COUNTS AFTER BACKWARD RECOVERY
INFLIGHT=0, IN ABORT=0, POSTPONED ABORT=0
DSNG007I -DB1A DB2 CATALOG LEVEL (1110) CODE LEVEL (1110) MODE (NFM)
DSNI049I -DB1A DSNIERST GRECP OR LPL RECOVERY FOR
AUTOMATIC GRECP RECOVERY-ID = 0
HAS COMPLETED.

IEE612I CN=C01 DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

The DIST address space responsible for providing support for remote requests is started.

The Db2 restart process is started to ensure that any recovery is performed so that data is in a consistent state.

Messages relating to further Db2 address spaces being started and data recovery being performed are displayed during the startup process.



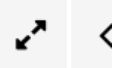


```
LU          USASDV02.DB1ALU1
GENERICLU  -NONE
DOMAIN     S0W1.DAL-EBIS.IHOST.COM
TCP        5025
SEC        0
RES        5026
IPNAME     -NONE
OPTIONS:
  PKGREL = COMMIT
S DB1AADMT
$HASP100 DB1AADMT ON STCINRDR
IEF695I START DB1AADMT WITH JOBNAME DB1AADMT IS ASSIGNED TO USER STCOPER
, GROUP GROUPZ
$HASP373 DB1AADMT STARTED
DSNA671I  DSNAGMAM THE ADMIN SCHEDULER DB1AADMT IS STARTING
DSN9022I  -DB1A DSNYASCP 'START DB2' NORMAL COMPLETION
DSNA672I  DSNAGMAM START COMMAND FOR ADMIN SCHEDULER DB1AADMT NORMAL
COMPLETION
DSNL519I  -DB1A DSNLIRSY TCP/IP SERVICES AVAILABLE 063
          FOR DOMAIN S0W1.DAL-EBIS.IHOST.COM AND PORT 5026

IEE612I CN=C01  DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

The administrative task scheduler (DB1AADMT), which is responsible for scheduling the execution of commonly run user-defined tasks, is being started automatically.

The message highlighted here indicates that the START DB2 command was successfully processed.



```
DSN3100I -DB1A DSN3UR00 - SUBSYSTEM DB1A READY FOR START COMMAND
DSN3100I -DB1T DSN3UR00 - SUBSYSTEM DB1T READY FOR START COMMAND
IEE254I MEMBER IEFSSN00 FOUND IN SVTSC.PARMLIB
IEE252I MEMBER DFHSS100 FOUND IN SVTSC.PARMLIB
DFH0100 CICS subsystem is now initialized
IEF196I DFH0100 CICS subsystem is now initialized
IEE389I MVS COMMAND PROCESSING AVAILABLE
ISG359I GRS EXIT CACHE WAS CREATED SUCCESSFULLY
IEE677I 16.41.59 MPF DISPLAY 433
MESSAGE SUPPRESSION AND USER EXITS INACTIVE - NOT INITIALIZED
GENERAL WTO USER EXIT (IEAVMXIT) INACTIVE
SUBSYSTEMS RECEIVING FOREIGN MESSAGES AND DOMS:
*ALL
FIELD      -MPF COLOR  HLIGHT INTEN   FIELD      -MPF COLOR  HLIGHT INTEN
URGATTN    -DFL RED    NONE    HIGH    IMEDACTN  -DFL WHITE  NONE    HIGH
EYETACTN   -DFL GREEN  NONE    NORM    GENMSG    -DFL GREEN  NONE    NORM
PPMSG      -DFL GREEN  NONE    NORM    SELPEN    -DFL BLUE   NONE    NORM
INSTRERR   -DFL WHITE  NONE    HIGH    ENTRYARA  -DFL GREEN  NONE    NORM
WARNLGEN   -DFL BLUE   NONE    NORM    WARNRGEN  -DFL BLUE   NONE    NORM
WARNRURG   -DFL RED    BLINK   HIGH    OOLCNTL   -DFL TURQU  NONE    NORM

IEE612I CN=C01  DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

In the scenario displayed here there are two messages relating to different Db2 subsystems that can be started. The start command used will need to have the subsystem name specified at the beginning of the command. For example, the DB1A Db2 subsystem would require the following command to initialize it:

-DB1A START DB2



Starting and Stopping Db2 > Starting Db2


```
-DB1A START DB2  
DSNY003I -DB1A SUBSYSTEM IS ALREADY ACTIVE  
DSN9023I -DB1A DSNYSAMD 'START DB2' ABNORMAL COMPLETION
```

```
IEE612I CN=C01 DEVNUM=160 SYS=PROD
```

```
IEE163I MODE= RD
```

As you can see in the example above, if you accidentally enter the start Db2 command and Db2 is already operational it will inform you of this fact and ignore the request.





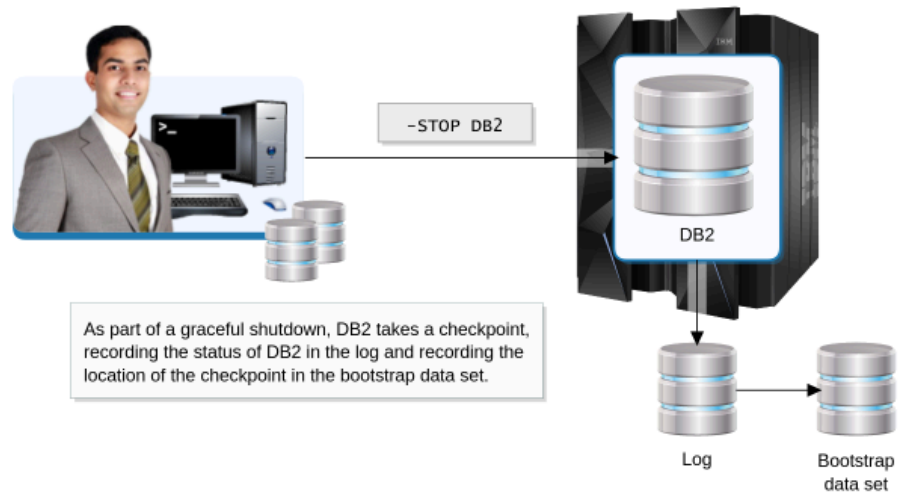
```
-START DB2 PARM(load module name)
-START DB2 DECP(load module name)
-START DB2 ACCESS(MAINT)
-START DB2 LIGHT(YES)
-START DB2 MSTR(DBM1,parm)
-START DB2 DIST
START admtproc,TRACE=ON
```

This command can be used to pass parameters to the DBM1, MSTR or DIST address spaces. For example, -START DB2 MSTR('REGION=8000K') would substitute REGION=8000K on the EXEC statement for the JCL used to initiate the MSTR address space.

There are several other parameters that can be specified when starting a Db2 subsystem.

Mouse-over the commands above for an explanation on when they would be required.





The examples shown so far assume that Db2 was stopped successfully last time it ran, which will result in Db2 starting smoothly. If there were problems with Db2 previously then you may encounter a number of different start-up messages pertaining to recovery or an unrecoverable error.

Click Play to see how Db2 determines whether recovery is required during start-up.



```
INFLIGHT=0, IN ABORT=0, POSTPONED ABORT=0
DSNG007I -DB1A DB2 CATALOG LEVEL ( A10) CODE LEVEL (A10) MODE (N)
DSNR002I -DB1A RESTART COMPLETED
-DB1ARECOVER POSTPONED
DSNV434I -DB1A DSNVRP NO POSTPONED ABORT THREADS FOUND
DSN9022I -DB1A DSNVRP 'RECOVER POSTPONED' NORMAL COMPLETION
DSNL003I -DB1A DDF IS STARTING
DSN3029I -DB1A DSN3RRRS RRS ATTACH PROCESSING IS AVAILABLE
DSNL519I -DB1A DSNLILNR TCP/IP SERVICES AVAILABLE
FOR DOMAIN S0W1.DAL-EBIS.IHOST.COM AND PORT 5025
DSNL004I -DB1A DDF START COMPLETE
LOCATION DALLAS9
LU USASDV02.DB9ALU1
GENERICLU -NONE
DOMAIN S0W1.DAL-EBIS.IHOST.COM
TCPPOINT 5025
SECPPOINT 0
RESPPOINT 5026
IPNAME -NONE
DSN9022I -DB1A DSNYASCP 'START DB2' NORMAL COMPLETION

IEE612I CN=C01 DEVNUM=160 SYS=PROD
-db1a stop db2
IEE163I MODE= RD
```



As you have just seen, when Db2 needs to be brought down, or terminated, the STOP DB2 command can be issued and must be invoked from a source that has appropriate authority. As part of the normal shutdown process, executing programs are allowed to complete and no new work is accepted.

Note: Before entering this command you should ensure that Db2 has no outstanding write-to-operator messages as this could prevent shutdown.

Type the **-DB1A STOP DB2** command and **press Enter** to shutdown the DB1A Db2 subsystem.

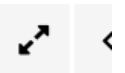


```
-DB1A STOP DB2
DSNY002I -DB1A SUBSYSTEM STOPPING
DSNL005I -DB1A DDF IS STOPPING
DSNL006I -DB1A DDF STOP COMPLETE
ATR169I RRS HAS UNSET EXITS FOR RESOURCE MANAGER
DSN.RRSATF.IBM.DB1A REASON: UNREGISTERED
ATR169I RRS HAS UNSET EXITS FOR RESOURCE MANAGER
DSN.RRSPAS.IBM.DB1A REASON: UNREGISTERED
DSNY025I -DB1A DSNYASCP DBM1 SHUTDOWN IS COMPLETE
DSNY025I -DB1A DSNYASCP DIST SHUTDOWN IS COMPLETE
-
-----PAGING COUNTS-----TIMINGS (MINS.)-----
-STEPNAME PROCSTEP RC EXCP CONN TCB SRB CLOCK
- SERV WORKLOAD PAGE SWAP VIO SWAPS
- 12601 IEFPROC 00 3898 1049 .02 .00 14285
- 12601 SYSTEM 0 0 0 0
-DB1ADIST ENDED. NAME- TOTAL TCB CPU TIME= .02
TOTAL ELAPSED TIME= 14285
IEF352I ADDRESS SPACE UNAVAILABLE
$HASP395 DB1ADIST ENDED

IEE612I CN=C01 DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

The DBM1 and DIST address spaces have completed their shutdown processing.

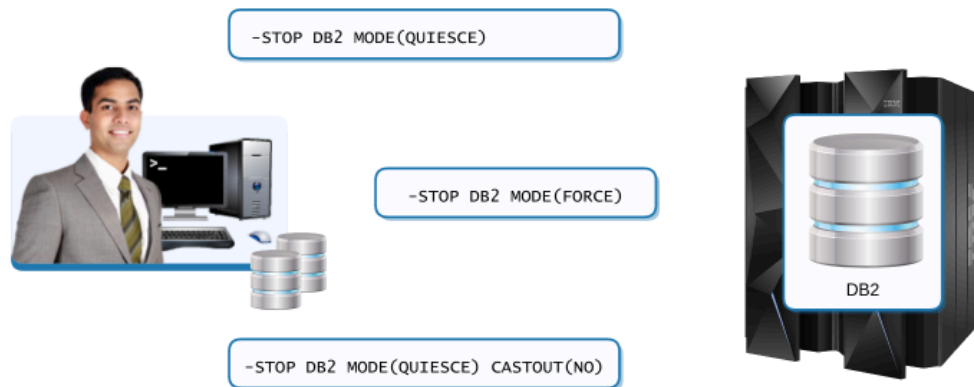
The messages displayed here provide you with an example of what you would be likely to see during the shutdown process.




```
-DB1AMSTR ENDED. NAME- TOTAL TCB CPU TIME= .83
TOTAL ELAPSED TIME= 14286
IEF352I ADDRESS SPACE UNAVAILABLE
$HASP395 DB1AMSTR ENDED
DXR121I DJ1A001 END-OF-TASK CLEANUP SUCCESSFUL - HI-CSA 440K -
HI-ACCT-CSA 0K
- -----TIMINGS (MINS.)-----
- -----PAGING COUNTS-----
IEA989I SLIP TRAP ID=X33E MATCHED. JOBNAME=*UNAVAIL, ASID=0022.
-STEPNAME PROCSTEP RC EXCP CONN TCB SRB CLOCK
SERV WORKLOAD PAGE SWAP VIO SWAPS
- 00 72 25 .00 8.58 14286
15209000 SYSTEM 0 0 0 0
-DB1AIRLM ENDED. NAME- TOTAL TCB CPU TIME= .00
TOTAL ELAPSED TIME= 14286
IEF352I ADDRESS SPACE UNAVAILABLE
$HASP395 DB1AIRLM ENDED
IEA989I SLIP TRAP ID=X33E MATCHED. JOBNAME=*UNAVAIL, ASID=001B.
DSN3104I -DB1A DSN3EC0X - TERMINATION COMPLETE
DSN3100I -DB1A DSN3EC0X - SUBSYSTEM DB1A READY FOR START COMMAND

IEE612I CN=C01 DEVNUM=160 SYS=PROD
IEE163I MODE= RD
```

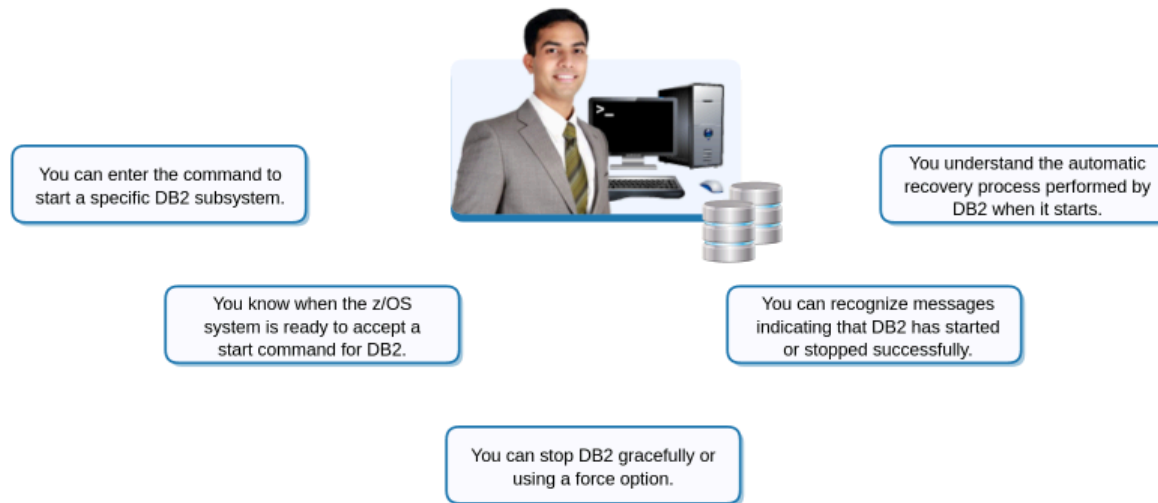
Several other screens of shutdown messages will be displayed as all Db2 address spaces are brought down. The highlighted messages above indicate that Db2 has been shutdown and that a start command for that Db2 subsystem can now be issued if required.



There are variations of the stop command that can be used in specific situations.

The QUIESCE option is the default when using the -STOP DB2 command and as mentioned previously, will allow existing processing to complete. The FORCE option will terminate any programs executing, which may result in additional error messages and dumps being produced during shutdown.

In a data sharing environment, the CASTOUT option can be used to specify the action taken with changed pages residing in a group buffer pool. YES is the default and will write the buffer pool changes to disk.



In this section you have looked at the commands used to start and stop Db2 and the majority of messages produced as a result of processing these requests.