Proyecto de creación y gestión de bases de datos con DB2

Por Diego Reguera

- **Creamos un usuario en Linux**

adduser ibm17

passwd ibm17

- **Creamos la instancia llamada ibm17**

cd /opt/ibm/db2/V11.1/instance/

./db2icrt -u ibm17 ibm17

DBI1070I Program db2icrt completed successfully.

exit

exit

- **Dentro de esta instancia se crea la base de datos "SAMPLE"**

db2start

05/17/2022 16:20:40   0   0   SQL1063N DB2START processing was successful.

SQL1063N DB2START processing was successful.

db2sampl

'db2sampl' processing complete.

db2 connect to sample

Database Connection Information

Database server   = DB2/LINUXX8664 11.1.4.5

SQL authorization ID   = IBM17

Local database alias   = SAMPLE

- ◼ Nos piden la búsqueda de datos utilizando SQL

- ◼ Insertamos una query que seleccione el número de empleado, apellido y nivel educativo de los empleados igual o superior a 17, y que esté ordenado por apellido.

[ibm17@edserver ~]$ db2 "select empno, lastname, edlevel from employee where edlevel >= 17 order by lastname"

```
EMPNO  LASTNAME       EDLEVEL

------ --------------- -------

000010 HAAS             18

200010 HEMMINGER        18

200220 JOHN             18

000210 JONES            17

000030 KWAN             20

000110 LUCCHESSI        19

000220 LUTZ             18

000240 MARINO           17

200240 MONTEVERDE       17

200140 NATZ             18

000140 NICHOLLS         18

000160 PIANKA           17

000280 SCHNEIDER        17

200280 SCHWARTZ         17
```

000180 SCOUTTEN   17

000020 THOMPSON   18

  16 record(s) selected.

- ■ Se pide que se seleccione la suma de salarios de los empleados agrupados por el código del departamento en el que trabajan

[ibm17@edserver ~]$ db2 "select workdept, sum(salary) as sum_salary from employee group by workdept"

WORKDEPT SUM_SALARY

-------- --------------------------------

A00   354250.00

B01   94250.00

C01   308890.00

D11   646620.00

D21   358680.00

E01   80175.00

E11   317140.00

E21   282520.00

  8 record(s) selected.

- ■ Se pide seleccionar el nombre y apellido de los empleados y el nombre del departamento en el que trabajan

[ibm17@edserver ~]$ db2 "select e.firstnme, e.lastname, d.deptname from employee e, department d"

```
FIRSTNME    LASTNAME       DEPTNAME

------------ --------------- ------------------------------------

CHRISTINE   HAAS        SPIFFY COMPUTER SERVICE DIV.

MICHAEL     THOMPSON      SPIFFY COMPUTER SERVICE DIV.


....



MICHELLE    SPRINGER       BRANCH OFFICE J2

HELENA      WONG        BRANCH OFFICE J2

ROY        ALONZO       BRANCH OFFICE J2


  588 record(s) selected.
```

db2 connect reset

DB20000I The SQL command completed successfully.

- Preparamos la base de datos a tipo analítico para que esté organizada la base de datos por columnas en vez de por filas

db2set DB2_WORKLOAD=ANALYTICS

db2stop

db2start

05/17/2022 16:50:00   0   0   SQL1026N The database manager is already active.

SQL1026N The database manager is already active.

- En la instancia ibm17 se crea la base de datos dbibm17 con un almacenamiento automático en /fsdbibm17 y con log archivo para cargar el trabajo analítico.

su

[root@edserver ibm17]# cd /

[root@edserver /]# mkdir fsdbibm17

[root@edserver /]# cd fsdbibm17

[root@edserver /]# chmod -R 777 fsdbibm17

[root@edserver /]# cd fsdbibm17/

[root@edserver fsdbibm17]# mkdir archivo

[root@edserver fsdbibm17]# mkdir backups

[root@edserver fsdbibm17]# chmod 777 archivo

[root@edserver fsdbibm17]# chmod 777 backups

[root@edserver fsdbibm17]# exit

[ibm17@edserver ~]$ db2 "create database dbibm17 on /fsdbibm17"

DB20000I The CREATE DATABASE command completed successfully.

[ibm17@edserver ~]$ db2 update db cfg for dbibm17 using LOGARCHMETH1 DISK:'/fsdbibm17/archivo'

DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.

db2 connect to dbibm17

SQL1116N A connection to or activation of database "DBIBM17" failed because

the database is in BACKUP PENDING state. SQLSTATE=57019

db2 "backup database dbibm17 to /fsdbibm17/backups"

Backup successful. The timestamp for this backup image is : 20220517171428

[ibm17@edserver ~]$ db2 get db cfg

- ■ Se crea el stogroup para almacenar datos llamado sgibm17 utilizando los paths o directorios : "/fssgibm17/path1" y "/fssgibm17/path2" y que será el stogroup por defecto de la base de datos.

[ibm17@edserver ~]$ db2 connect to dbibm17

  Database Connection Information

  Database server   = DB2/LINUXX8664 11.1.4.5

  SQL authorization ID   = IBM17

  Local database alias   = DBIBM17

su

root@edserver ibm17]# cd /

[root@edserver /]# mkdir fssgibm17

[root@edserver /]# chmod 777 fssgibm17

[root@edserver /]# cd fssgibm17/

[root@edserver fssgibm17]# mkdir path1

[root@edserver fssgibm17]# mkdir path2

[root@edserver fssgibm17]# chmod 777 path1

[root@edserver fssgibm17]# chmod 777 path2

exit

[ibm17@edserver ~]$ db2 "create stogroup sgibm17 on '/fssgibm17/path1', '/fssgibm17/path2'"

DB20000I The SQL command completed successfully.

- ■ En la base de datos "dbibm17" creamos 4 tablespaces "TSEX171, TSEX172, TSEX173 y TSEX174" gestionados por almacenamiento automático en el stogroup sgibm17

[ibm17@edserver ~]$ db2 "create tablespace TSEX171 using stogroup sgibm17"

DB20000I The SQL command completed successfully.

[ibm17@edserver ~]$ db2 "create tablespace TSEX172 using stogroup sgibm17"

DB20000I The SQL command completed successfully.

[ibm17@edserver ~]$ db2 "create tablespace TSEX173 using stogroup sgibm17"

DB20000I The SQL command completed successfully.

[ibm17@edserver ~]$ db2 "create tablespace TSEX174 using stogroup sgibm17"

DB20000I The SQL command completed successfully.

- ■ En la base de datos "dbibm17" creamos una tabla llamada "ibm17.rowhist" y sus índices igual a otra tabla llamada "history" localizada en "inst461" en el directorio /home/inst461/tablesrow.ddl ; esta tabla a de estar organizada por filas y debe crearse en el tablespace "TSEX171 y sus índices en el "TSEX172".

cd /home/inst461/db2blu/

cp tablesrow.ddl $HOME

cd $HOME

gedit ibm17row.ddl

db2 -tvf ibm17row.ddl

set current schema = 'ROWORG'

DB20000I The SQL command completed successfully.

CREATE TABLE ibm17.rowhist (ACCT_ID   INTEGER   NOT NULL, TELLER_ID   SMALLINT   NOT NULL, BRANCH_ID   SMALLINT   NOT NULL, BALANCE   DECIMAL(15,2) NOT NULL, DELTA DECIMAL(9,2)   NOT NULL, PID   INTEGER   NOT NULL, TSTMP   TIMESTAMP   NOT NULL WITH DEFAULT, ACCTNAME   CHAR(20)   NOT NULL, TEMP   CHAR(6)   NOT NULL) IN TSEX171 INDEX IN TSEX172

DB20000I The SQL command completed successfully.

CREATE INDEX HISTIX1 ON ibm17.rowhist (BRANCH_ID ASC) ALLOW REVERSE SCANS

DB20000I The SQL command completed successfully.

CREATE INDEX HISTIX2 ON ibm17.rowhist (TELLER_ID ASC) ALLOW REVERSE SCANS

DB20000I The SQL command completed successfully.

■ Ahora creamos la misma table anterior pero organizada por columnas, con el nombre de "ibm17.rowhist" y localizada en "inst461" en el directorio /home/inst461/tablesrow.ddl. Debe crearse en el tablespace "TSEX173 y sus índices en el "TSEX174".

[ibm17@edserver ~]$ gedit ibm17col.ddl

[ibm17@edserver ~]$ db2 -tvf ibm17col.ddl

set current schema = 'ROWORG'

DB20000I The SQL command completed successfully.

CREATE TABLE ibm17.colhist (ACCT_ID   INTEGER   NOT NULL, TELLER_ID   SMALLINT   NOT NULL, BRANCH_ID   SMALLINT   NOT NULL, BALANCE   DECIMAL(15,2) NOT NULL, DELTA DECIMAL(9,2)   NOT NULL, PID   INTEGER   NOT NULL, TSTMP   TIMESTAMP   NOT NULL WITH DEFAULT, ACCTNAME   CHAR(20)   NOT NULL, TEMP   CHAR(6)   NOT NULL) organize by column IN TSEX173 INDEX IN TSEX174

DB20000I The SQL command completed successfully.

CREATE INDEX HISTIX3 ON ibm17.colhist (BRANCH_ID ASC) ALLOW REVERSE SCANS

DB20000I The SQL command completed successfully.

CREATE INDEX HISTIX4 ON ibm17.colhist (TELLER_ID ASC) ALLOW REVERSE SCANS

DB20000I The SQL command completed successfully.

■ Se cargan las tablas "ibm17.rowhist" y "ibm17.colhist" con los datos del fichero llamado "histdata.del que está en directorio …/inst450/db2blu/

[ibm17@edserver ~]$ cd /home/inst450/db2blu/

[ibm17@edserver db2blu]$ cp histdata.del $HOME

[ibm17@edserver db2blu]$ cd $HOME

[ibm17@edserver ~]$ db2 "load from $HOME/histdata.del of del replace into ibm17.rowhist"

SQL3039W The memory available to LOAD for DATA BUFFER prohibits full LOAD

parallelism. Load parallelism of "2" will be used

SQL3109N The utility is beginning to load data from file

"/home/ibm17/histdata.del".

SQL3500W The utility is beginning the "LOAD" phase at time "05/17/2022

18:18:18.887293".

SQL3519W Begin Load Consistency Point. Input record count = "0".

SQL3520W Load Consistency Point was successful.

SQL3110N The utility has completed processing. "490864" rows were read from

the input file.

SQL3519W Begin Load Consistency Point. Input record count = "490864".

SQL3520W Load Consistency Point was successful.

SQL3515W The utility has finished the "LOAD" phase at time "05/17/2022

18:18:20.669180".

SQL3500W The utility is beginning the "BUILD" phase at time "05/17/2022

18:18:20.670341".

SQL3213I The indexing mode is "REBUILD".

SQL3515W The utility has finished the "BUILD" phase at time "05/17/2022

18:18:21.768960".

Number of rows read   = 490864

Number of rows skipped   = 0

Number of rows loaded   = 490864

Number of rows rejected   = 0

Number of rows deleted   = 0

Number of rows committed   = 490864

[ibm17@edserver ~]$ db2 "load from $HOME/histdata.del of del replace into ibm17.colhist"

SQL3109N The utility is beginning to load data from file

"/home/ibm17/histdata.del".

SQL3500W The utility is beginning the "ANALYZE" phase at time "05/17/2022

18:19:54.058076".

SQL3519W Begin Load Consistency Point. Input record count = "0".

SQL3520W Load Consistency Point was successful.

SQL3515W The utility has finished the "ANALYZE" phase at time "05/17/2022

18:19:58.917246".

SQL3500W The utility is beginning the "LOAD" phase at time "05/17/2022

18:19:58.918044".

SQL3110N The utility has completed processing. "490864" rows were read from

the input file.

SQL3519W Begin Load Consistency Point. Input record count = "490864".

SQL3520W Load Consistency Point was successful.

SQL3515W The utility has finished the "LOAD" phase at time "05/17/2022 18:20:04.948084".

SQL3500W The utility is beginning the "BUILD" phase at time "05/17/2022 18:20:04.949346".

SQL3213I The indexing mode is "REBUILD".

SQL3515W The utility has finished the "BUILD" phase at time "05/17/2022 18:20:05.859889".

Number of rows read   = 490864
Number of rows skipped   = 0
Number of rows loaded   = 490864
Number of rows rejected   = 0
Number of rows deleted   = 0
Number of rows committed   = 490864

- Se hace un "backup" de tipo online

[ibm17@edserver ~]$ db2 "backup database dbibm17 online to /fsdbibm17/backups"

Backup successful. The timestamp for this backup image is : 20220517182153

■ Se crea un tablespace llamado "TSEX175 en el stogroup por defecto

[ibm17@edserver ~]$ db2 connect to dbibm17

 Database Connection Information

 Database server   = DB2/LINUXX8664 11.1.4.5
 SQL authorization ID   = IBM17
 Local database alias   = DBIBM17

[ibm17@edserver ~]$ db2 "create tablespace TSEX175 using stogroup sgibm17"

DB20000I The SQL command completed successfully.