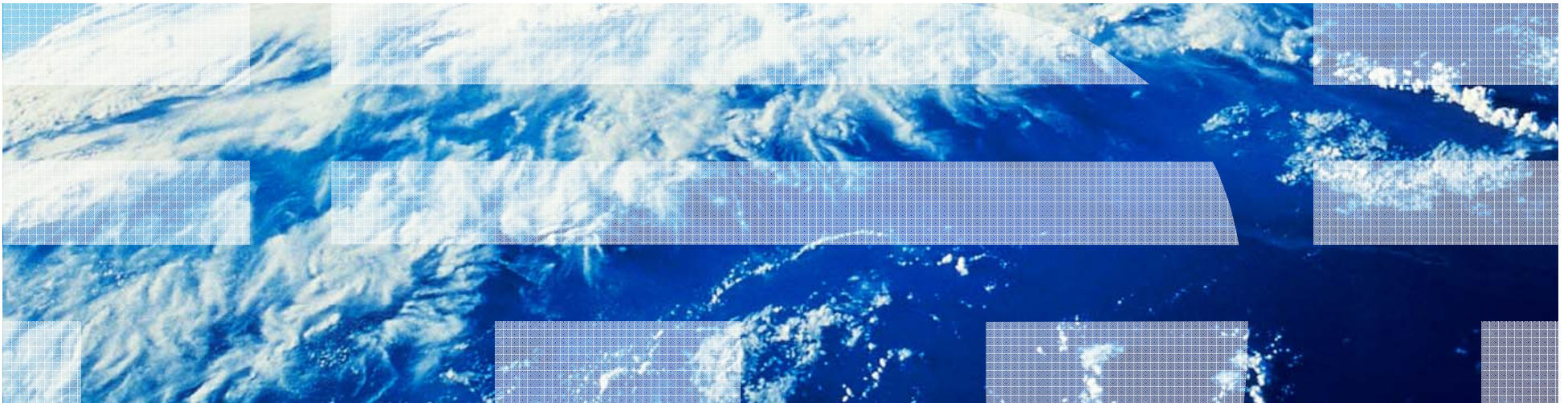


Command Line Processor (CLP) and DB2 GUI Tool usage

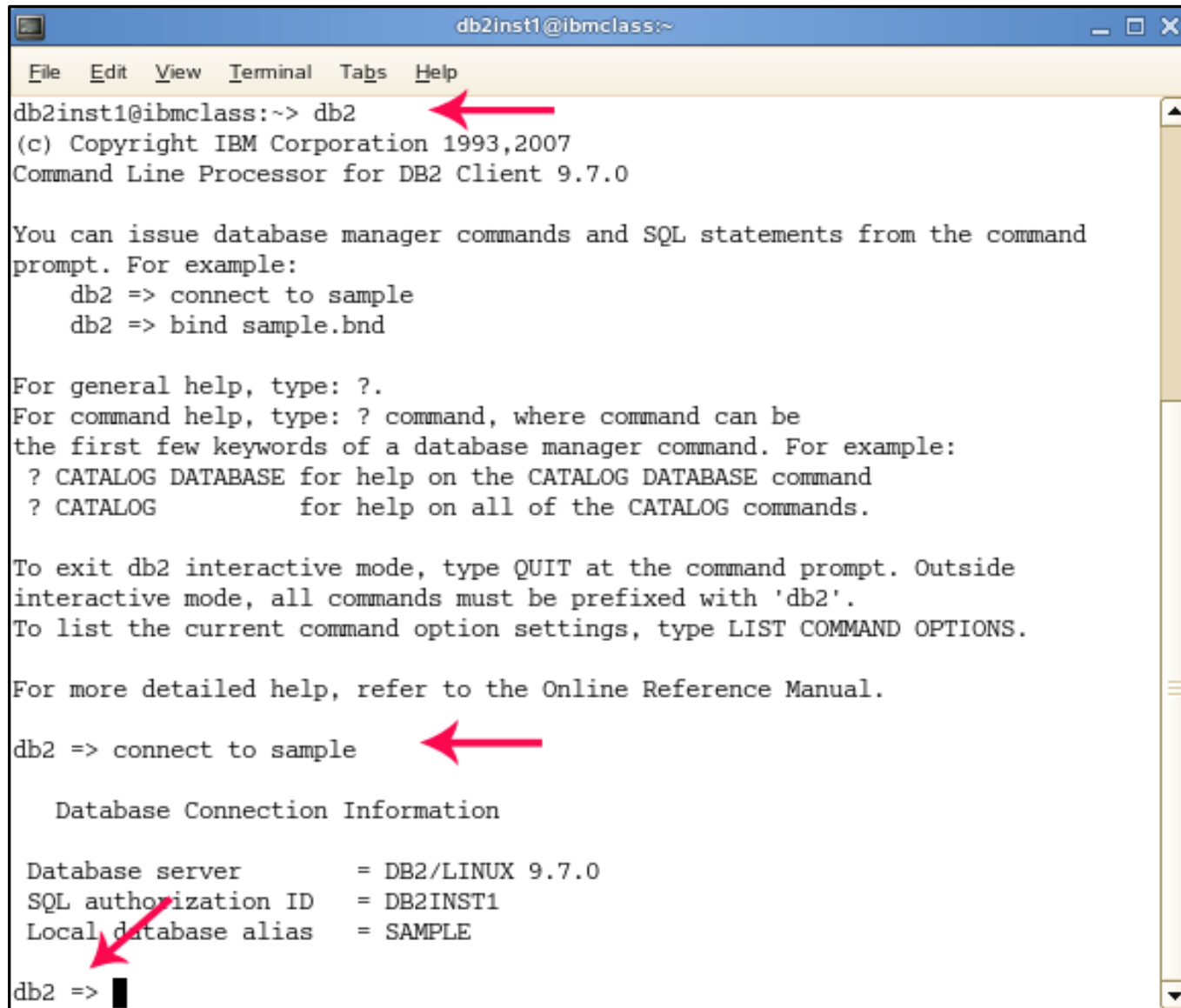


Unit objectives

After completing this unit, you should be able to:

- Utilize the DB2 Command Line Processor to run DB2 commands and SQL statements
- Use CLPPlus to connect databases and to define, edit, and run statements, scripts, and commands
- Describe the GUI tools available that support administration and development with DB2 LUW servers
- Use Data Studio to perform database administration tasks and execute SQL scripts

CLP Command Line Processor



```
db2inst1@ibmclass:~> db2
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 9.7.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
    db2 => connect to sample
    db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
    ? CATALOG DATABASE for help on the CATALOG DATABASE command
    ? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

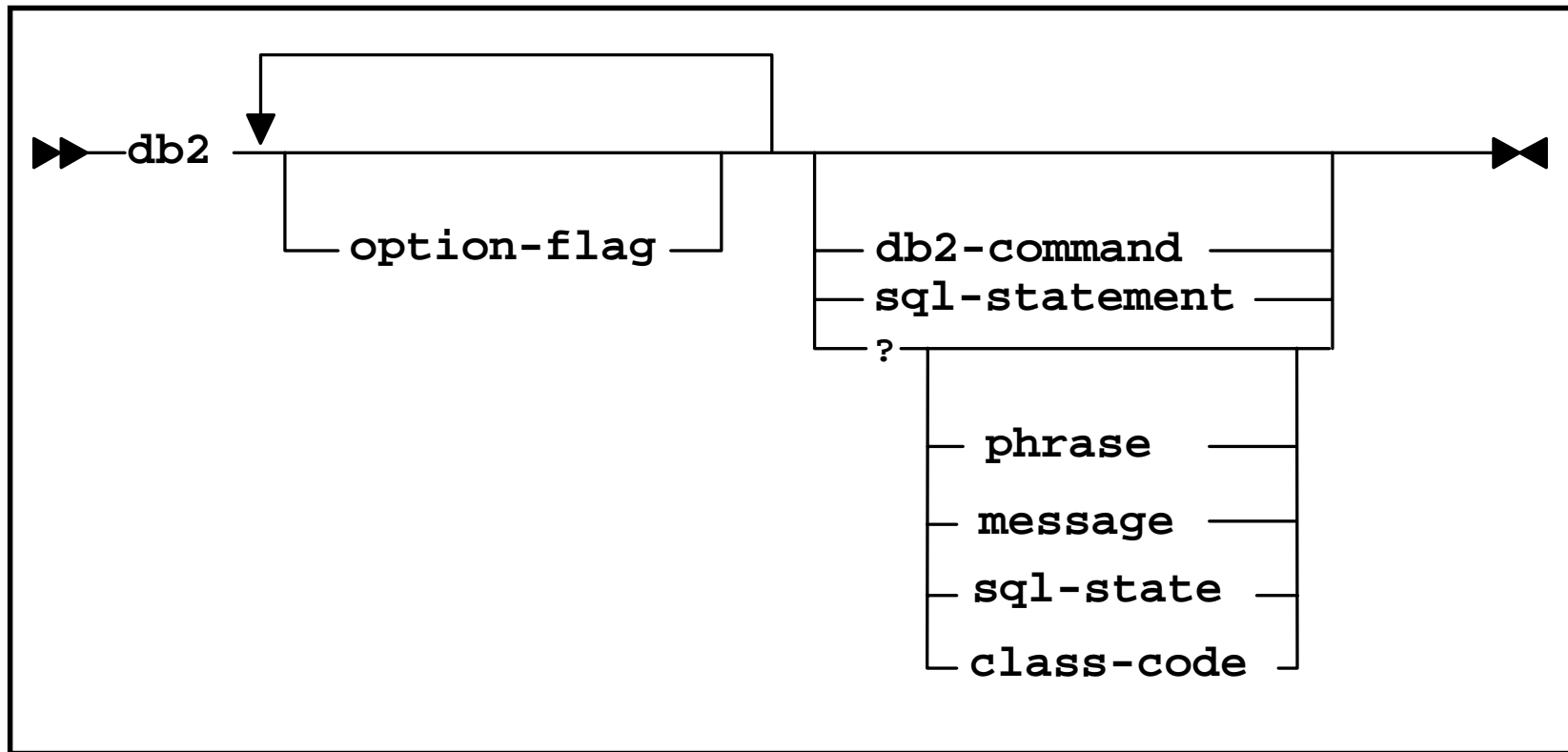
db2 => connect to sample

    Database Connection Information

Database server      = DB2/LINUX 9.7.0
SQL authorization ID = DB2INST1
Local database alias = SAMPLE

db2 =>
```

CLP syntax



Online reference

- Online Command Reference

db2 ?

db2 ? command string

db2 ? SQLnnnn (nnnn = 4 or 5 digit SQLCODE)

db2 ? nnnnn (nnnnn = 5 digit SQLSTATE)

- Online Reference Manuals

Using the CLP

Non-interactive mode

```
db2 connect to musicdb  
db2 "select * from syscat.tables" | more  
    ↗  
    (double quotes may be required)
```

Interactive mode

```
db2  
db2=> connect to musicdb  
db2=> select * from syscat.tables
```

CLP command options

```
db2inst1@ibmclass:~> db2 list command options
```

Command Line Processor Option Settings

```
Backend process wait time (seconds)      (DB2BQTIME) = 1
No. of retries to connect to backend      (DB2BQTRY)  = 60
Request queue wait time (seconds)         (DB2RQTIME) = 5
Input queue wait time (seconds)           (DB2IQTIME) = 5
Command options                           (DB2OPTIONS) =
```

Option	Description	Current Setting
-----	-----	-----
-a	Display SQLCA	OFF
-c	Auto-Commit	ON
-d	Retrieve and display XML declarations	OFF
-e	Display SQLCODE/SQLSTATE	OFF
-f	Read from input file	OFF
-i	Display XML data with indentation	OFF
-l	Log commands in history file	OFF
-m	Display the number of rows affected	OFF
-n	Remove new line character	OFF
-o	Display output	ON
-p	Display interactive input prompt	ON
-q	Preserve whitespaces & linefeeds	OFF
-r	Save output to report file	OFF
-s	Stop execution on command error	OFF
-t	Set statement termination character	OFF
-v	Echo current command	OFF
-w	Display FETCH/SELECT warning messages	ON
-x	Suppress printing of column headings	OFF
-z	Save all output to output file	OFF

```
db2inst1@ibmclass:~>
```

Modify CLP options

1 Temporary for Command

```
db2 -r options.rep list command options
db2 -svtf create.tab3
db2 +c "update tab3 set salary=salary + 100"
```

2 Temporary for Interactive CLP Session

db2=>update command options using c off a on

3 Temporary for non-interactive CLP Session

```
export DB2OPTIONS="-svt" (UNIX)
set DB2OPTIONS="-svt" (Windows)
db2 -f create.tab3
```

4 Every session

put point **3** in UNIX **db2profile**
or Windows System Environment Variables

Input file

Edit create.tab

```
-- comment:  db2 -svtf create.tab

connect to sample;

create table tab3
  (name varchar(20) not null,
   phone char(40),
   salary dec(7,2));

select * from tab3;

commit work;

connect reset;
```

db2 -svtf create.tab

Input file: Operating system commands

vi seltab

```
echo "Table Name Is" $1 > out.sel  
db2 "select * from $1" >> out.sel
```

edit seltab.cmd

```
echo 'Table Name Is' %1 > out.sel  
db2 Select * from %1 >> out.sel
```

seltab org

out.sel
contents

Table Name Is org

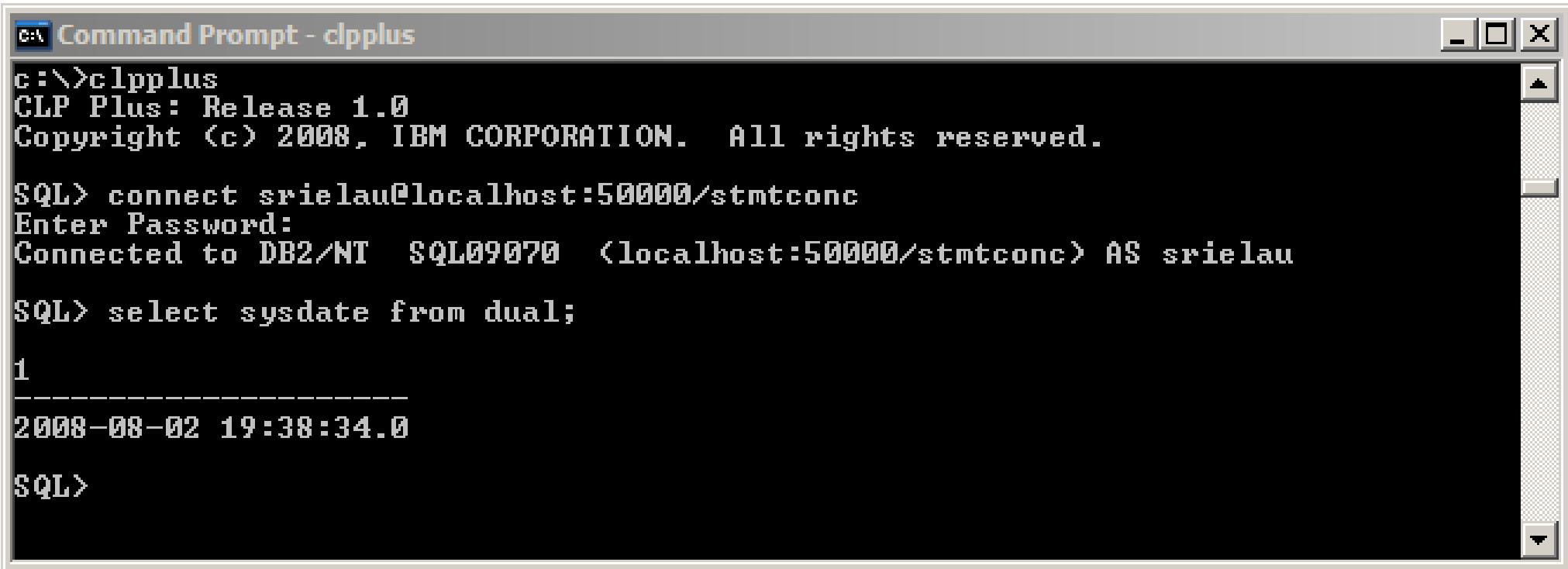
DEPTNUMB	DEPTNAME	MANAGER	DIVISION	LOCATION
10	Head Office	160	Corporate	New York
15	New England	50	Eastern	Boston
20	Mid Atlantic	10	Eastern	Washington
38	South Atlantic	30	Eastern	Atlanta
42	Great Lakes	100	Midwest	Chicago
51	Plains	140	Midwest	Dallas
66	Pacific	270	Western	San Francisco
84	Mountain	290	Western	Denver

QUIT/TERMINATE/CONNECT RESET differences

<i>CLP COMMAND</i>	<i>Terminate CLP Back-end Process</i>	<i>Disconnect database Connection</i>
quit	No	No
terminate	Yes	Yes
connect reset	No	Yes if CONNECT=1 (RUOW)

CLPPlus command line processor

- CLPPlus:
 - SQL*Plus compatible command
 - Variable substitution
 - Column formatting
 - Simple reporting



```
c:\>clpplus
CLP Plus: Release 1.0
Copyright (c) 2008, IBM CORPORATION. All rights reserved.

SQL> connect srielau@localhost:50000/stmtconc
Enter Password:
Connected to DB2/NT  SQL09070  (localhost:50000/stmtconc) AS srielau

SQL> select sysdate from dual;

1
-----
2008-08-02 19:38:34.0

SQL>
```

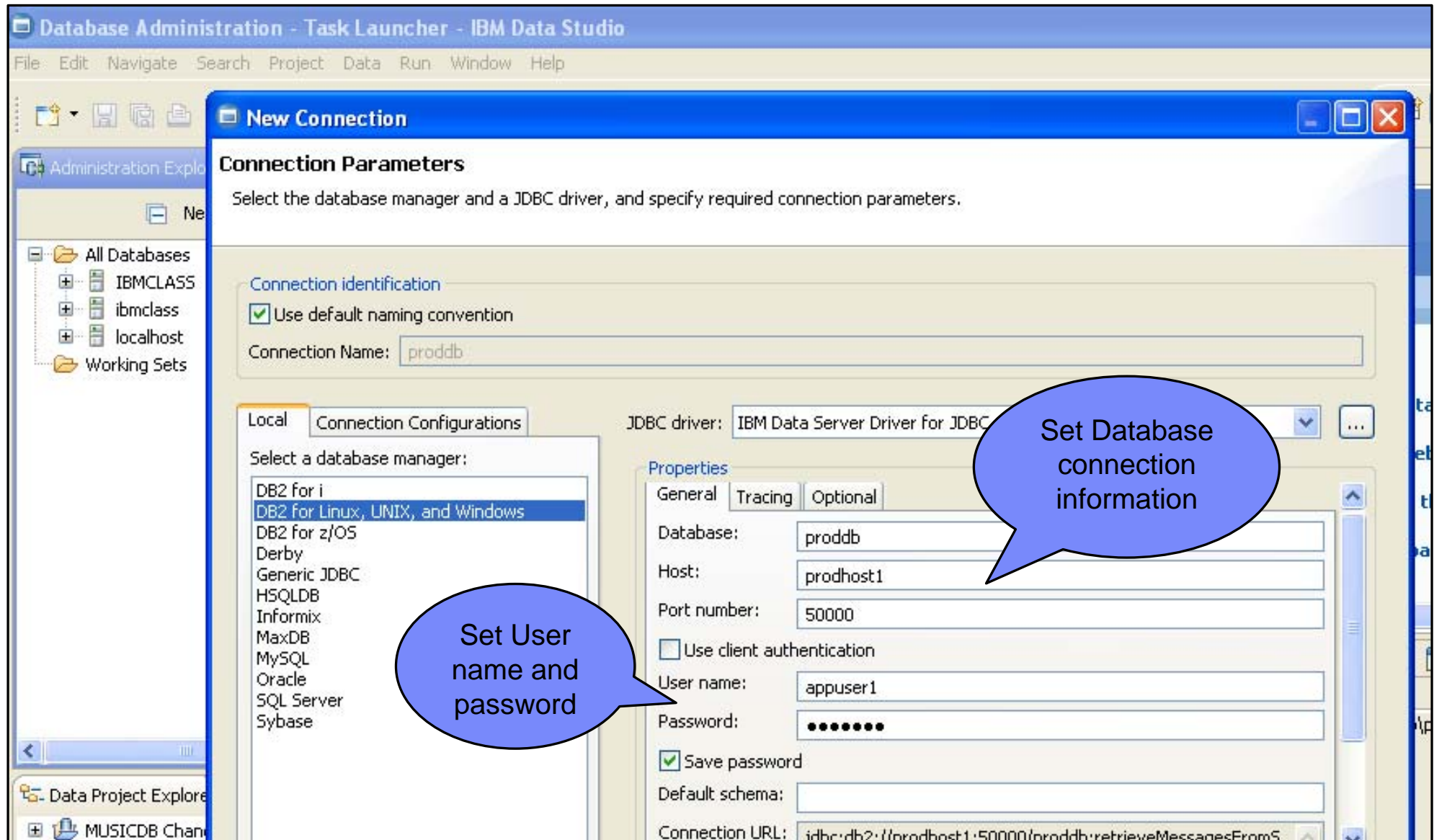
CLPPlus features

- Support for establishing connections to databases when a database user ID and password are provided.
- A buffer that can be used to store scripts, script fragments, SQL statements, SQL PL statements, or PL/SQL statements for editing and then execution. Text in the buffer can be listed, printed, edited, or run as a batch script.
- A comprehensive set of processor commands can be used to define variables and strings that can be stored in the buffer.
- A set of commands that retrieve information about the database and database objects.
- Ability to store buffers or buffer output to a file.
- Multiple options for formatting the output of scripts and queries.
- Support for executing system-defined routines.
- Support for executing operating system commands.
- Option for recording the output of executed commands, statements, or scripts.

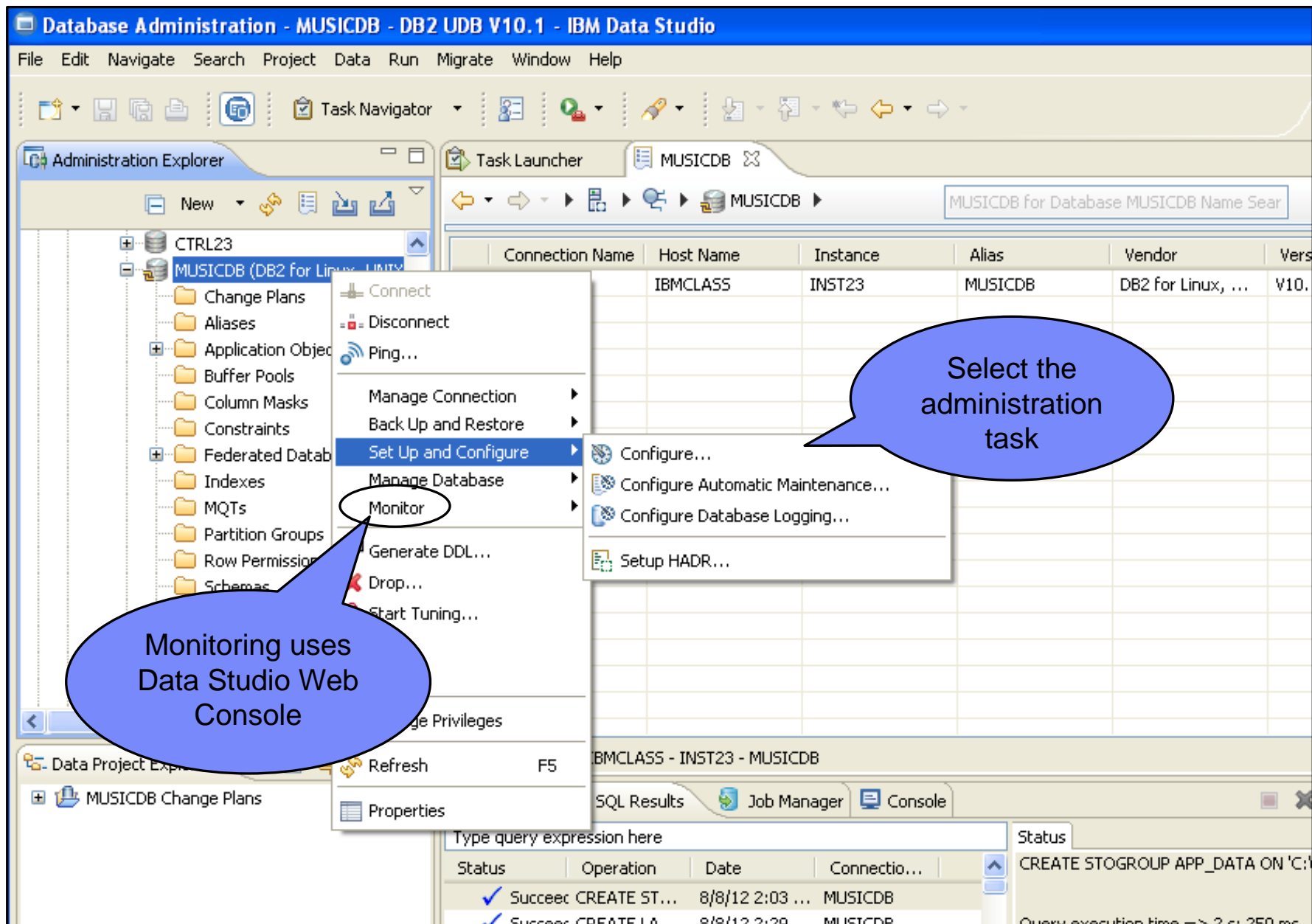
DB2 GUI Tools

- There are a set of tools that work together to provide a variety of Database Administration and development functions
 - **IBM Data Studio 3.1.1 enhanced to support DB2 V10.1**
 - The Data Studio client simplifies administering your DB2 databases by providing task assistants to perform common database administration tasks.
 - Starting or stopping an instance or database
 - Configuring an instance or database
 - Backing up, restoring, recovering a database or table space
 - Unloading and loading data in a table
 - Create and Execute SQL scripts
 - **IBM Data studio Web console**
 - Provides health and availability monitoring features and job creation and management functions for DB2 LUW and DB2 for z/OS databases.
 - Use the health pages to view alerts, applications, utilities, storage
 - Use the job manager to create and manage script-based jobs
 - **IBM InfoSphere Optim Query Workload Tuner**
 - Helps database administrators and SQL developers optimize the performance of SQL statements in applications that query DB2 for Linux, UNIX, and Windows databases and DB2 for z/OS subsystems.

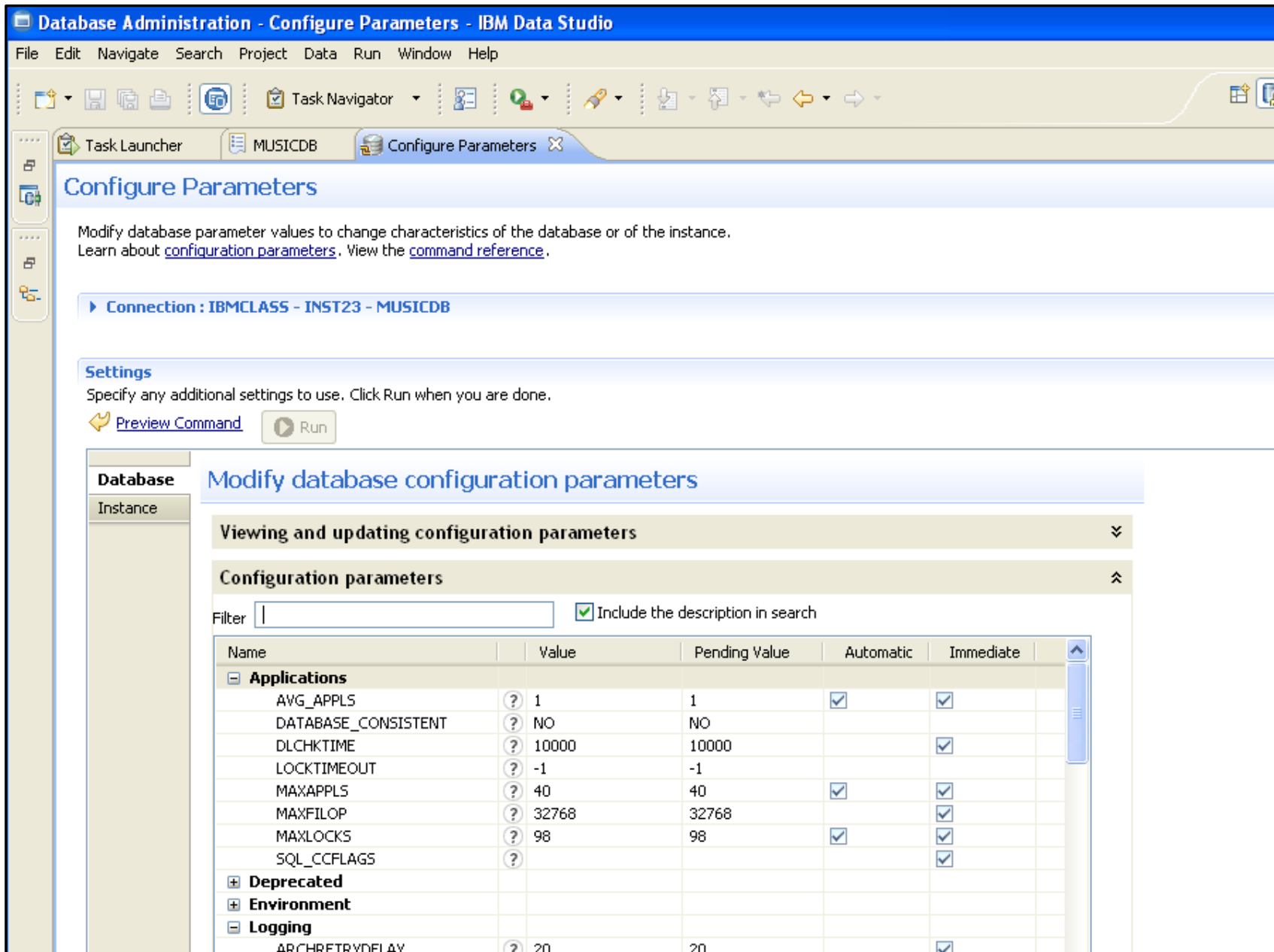
Data Studio – Database Connection profiles



Data Studio – Selection of Database tasks



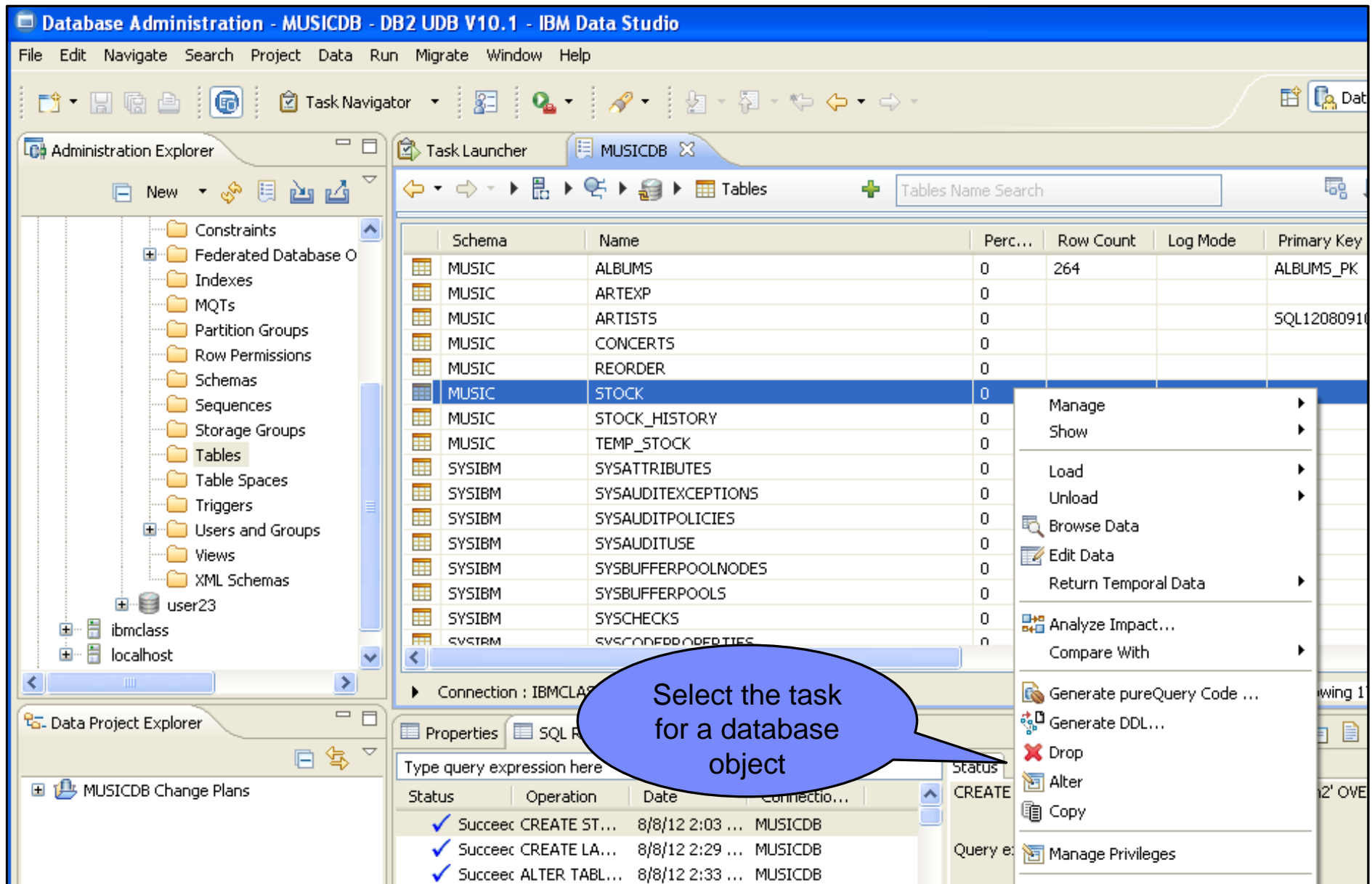
Data Studio – Setting Configuration Options



The screenshot shows the 'Database Administration - Configure Parameters - IBM Data Studio' window. The interface includes a menu bar (File, Edit, Navigate, Search, Project, Data, Run, Window, Help) and a toolbar with various icons. The main pane is titled 'Configure Parameters' and contains instructions: 'Modify database parameter values to change characteristics of the database or of the instance. Learn about [configuration parameters](#). View the [command reference](#).' Below this, a connection is selected: 'Connection : IBMCLASS - INST23 - MUSICDB'. The 'Settings' section has a 'Preview Command' button and a 'Run' button. The left sidebar shows a tree view with 'Database' and 'Instance' nodes. The main content area is titled 'Modify database configuration parameters' and contains a section 'Viewing and updating configuration parameters'. Below this is a 'Configuration parameters' section with a filter input and a checkbox 'Include the description in search'. A table lists various configuration parameters.

Name	Value	Pending Value	Automatic	Immediate
Applications				
AVG_APPLS	1	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DATABASE_CONSISTENT	NO	NO		
DLCHKTIME	10000	10000		<input checked="" type="checkbox"/>
LOCKTIMEOUT	-1	-1		
MAXAPPLS	40	40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MAXFILOP	32768	32768		<input checked="" type="checkbox"/>
MAXLOCKS	98	98	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SQL_CCFLAGS				<input checked="" type="checkbox"/>
Deprecated				
Environment				
Logging				
ARCHRETRYDELAY	20	20		<input checked="" type="checkbox"/>

Data Studio – Selecting tasks for an object



Data Studio – Create or Alter object properties

The screenshot displays the IBM Data Studio interface for managing a DB2 UDB V10.1 database named MUSICDB. The interface includes a left-hand navigation pane with a tree view showing the database structure (IBMCLASS, INST23, CTRL23, MUSICDB, Change Plans, Aliases, Application Objects, Buffer Pools, Column Masks, Constraints, Federated Datal, Indexes, MQTs, Partition Groups, Row Permissions, Schemas, Sequences). The main workspace shows the 'Task Launcher' with a list of tasks, including '* Default Change Plan 2012-09-17 15-51-26'. Below this is a table of database objects:

Name	Buffer Pool	Page Size	Size	Auto Resize	Increment	Max Size
TSP06	IBMDEFAULTBP	4096	0	true		
SMS01	IBMDEFAULTBP	4096	0	false		
TEMPSPACE1	IBMDEFAULTBP	4096	0	false		
TableSpace1	IBMDEFAULTBP	4096	0	false		

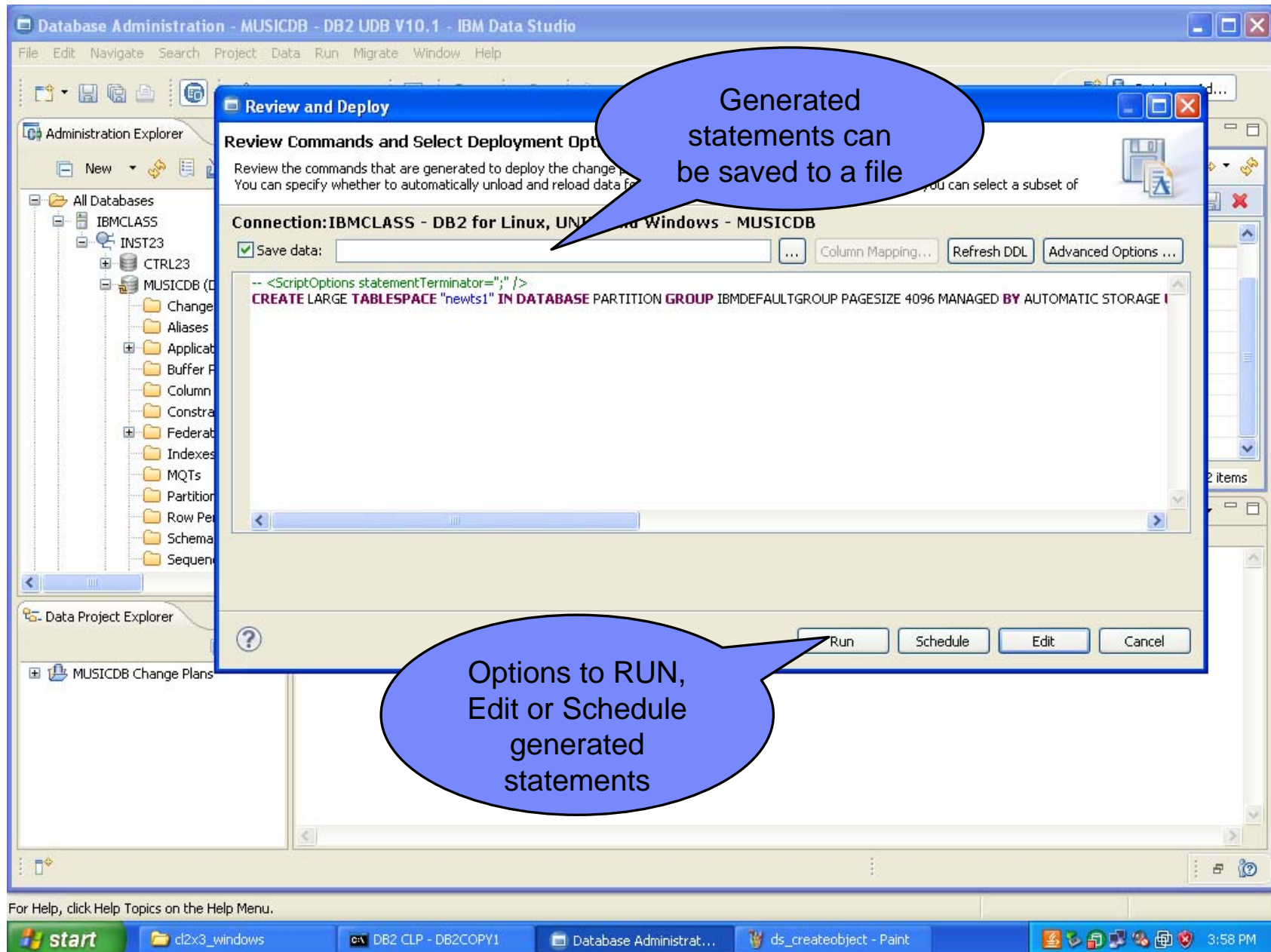
Below the table, the 'Properties' tab is selected, showing the configuration for 'TableSpace1'. The properties include:

- Page size: 4 KB
- Initial size: 0 KB
- Autoresize: ☐ Automatically adjust the size of the table space
- Increase size: <default> KB
- Maximum size: <default> KB
- Extent size: 32 4 KB Pages
- Prefetch size: <default> 4 KB Pages

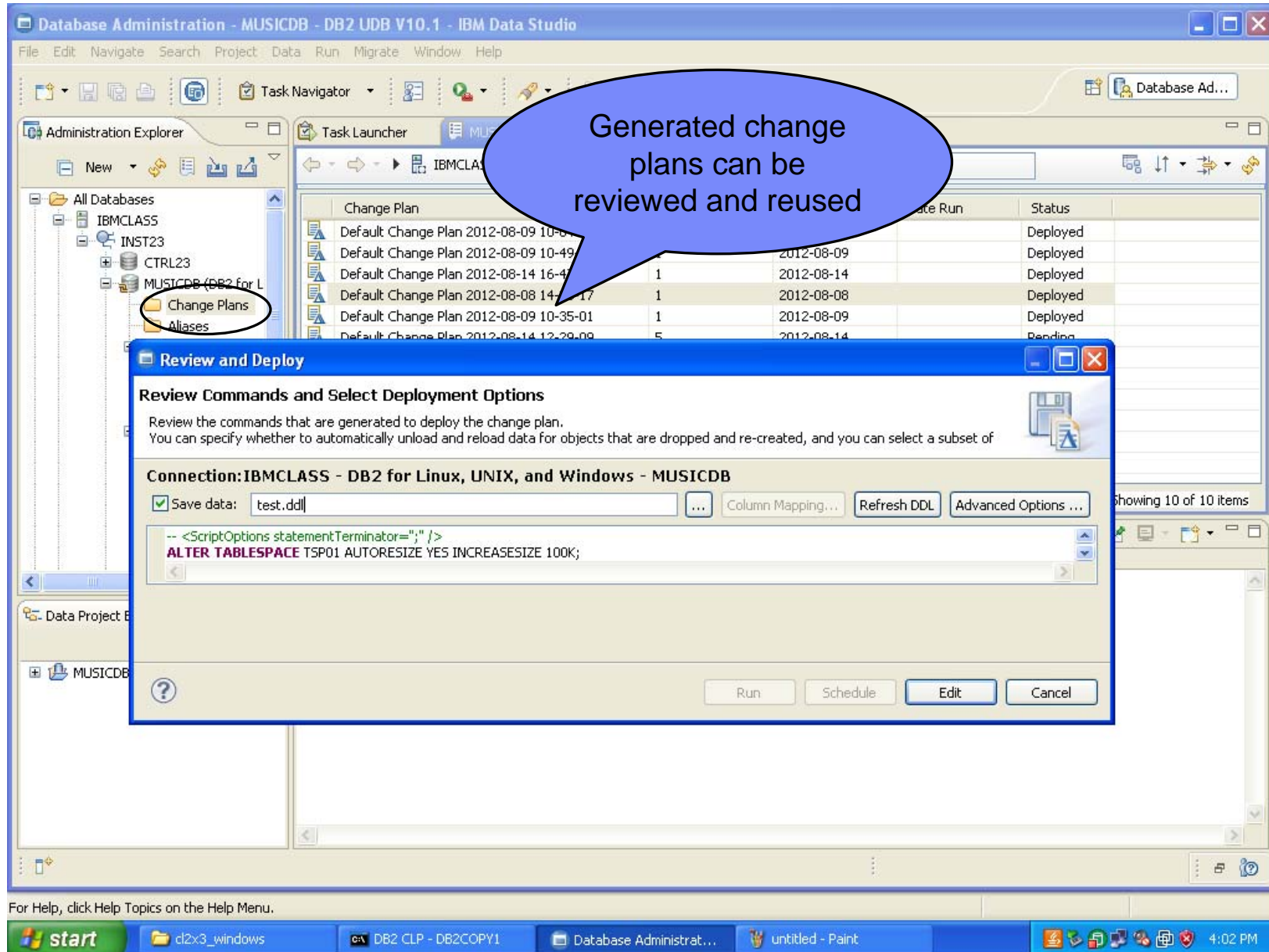
Three callouts highlight key features:

- Change plans generated for object maintenance**: Points to the 'Task Launcher' area.
- Review & Deploy Generates DDL for editing or execution**: Points to the 'Properties' tab.
- Set options using the properties view**: Points to the 'Properties' tab.

Data Studio – Review, Edit, Save or Schedule generated DDL statements



Data Studio – working with generated change plans



Data Studio – Running SQL Scripts

The screenshot displays the IBM Data Studio interface with the following components and annotations:

- Task Launch Panel:** A callout bubble points to the 'Connection: IBMCLASS - INST23 - MUSICDB' dropdown, stating: "A connection profile is selected for execution".
- Execution Button:** A callout bubble points to the green play button icon, stating: "Start Execution".
- SQL Editor:** Contains the following SQL script:

```
select substr(tbspace,1,18) as tbspace,  
substr(definer,1,10) as definer, tbspaceid, tbspacetype,  
datatype, sgname from syscat.tablespace;
```
- Results Panel:** A callout bubble points to the 'Result1' tab, stating: "SQL Script Results can be viewed". The results are displayed in a table with columns: Status, Operation, TBSPACE, DEFINER, TBSPACEID, and a final column for the result value.
- Console Panel:** A callout bubble points to the console output, stating: "SQL statements can be edited and syntax checked". The console shows a list of messages, including several 'Succesec' (sic) messages and one 'Failed' message.

Status	Operation	TBSPACE	DEFINER	TBSPACEID	
✓	Succesec Default Cha	1 SYSCATSPACE	SYSIBM	0	D
✓	Succesec select grant	2 SYSTOOLSPACE	INST23	10	D
✓	Succesec grant_dbad.	3 TSP06	INST23	8	D
✓	Succesec select grant	4 USERSPACE1	SYSIBM	2	D
✓	Succesec create_devr	5 TEMPSPACE1	SYSIBM	1	S
✓	Succesec select grant	6 TSP01	INST23	3	D
✓	Succesec select grant	7 TSP05	INST23	7	D
✓	Succesec grant_devr	8 TSP04	INST23	6	D
✗	Failed call SYSINST	9 TSP02	INST23	4	D
✓	Succesec call SYSINST	10 TSP03	INST23	5	D
✓	Succesec call SYSINST	11 SMS01	INST23	9	S

Data Studio – Visual Explain for SQL queries

The screenshot displays the IBM Data Studio interface. At the top, the 'Task Launcher' tab is active, showing the connection 'IBMCLASS - INST23 - MUSICDB'. Below this, the 'Configuration' tab is selected, displaying the same connection. The SQL editor contains the following query:

```
SELECT BRANCH_ID, TELLER_ID, ACCT_ID, BALANCE, ACCTNAME
FROM test.HISTORY
WHERE branch_id = 20 and teller_id between 100 and 180
;
```

Two callout bubbles point to icons in the top right corner of the SQL editor: 'Visual Explain' (a green play button icon) and 'Optim Query Workload Tuner' (a red pin icon).

The bottom pane shows the 'Access Plan Diagram' tab. It displays a query plan diagram with the following nodes:

- RETURN** (31.7391) - A green oval node at the top.
- FETCH** (31.7391) - A yellow hexagon node below RETURN.
- IXSCAN** (13.7599) - A yellow hexagon node below FETCH.
- HISTIX TEST** (13.7599) - A green hexagon node below IXSCAN.
- HISTORY TEST** (31.7391) - A yellow rectangle node to the right of HISTIX TEST.

Arrows indicate the flow of data from the bottom nodes up to the RETURN node. A callout bubble points to the diagram with the text 'Visual Explain Shows access plan and costs'.

On the left side of the bottom pane, the 'Overview of Diagram' and 'Description of Selected Node' tabs are visible. The 'Description of Selected Node' tab is active, showing the text: 'Displays information about the node that is highlighted in the diagram.' Below this, the 'Attributes' section shows a table with one column, 'NAME'.

Unit summary

Having completed this unit, you should be able to:

- Utilize the DB2 Command Line Processor to run DB2 commands and SQL statements
- Use CLPPlus to connect databases and to define, edit, and run statements, scripts, and commands
- Describe the GUI tools available that support administration and development with DB2 LUW servers
- Use Data Studio to perform database administration tasks and execute SQL scripts