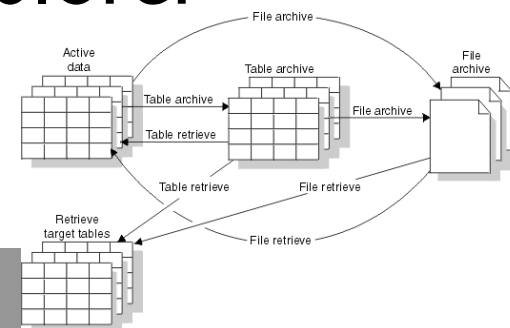




IBM Software Group

# IBM Developer for z Systems – for ISPF Developers

## Module 8 – Using the Data Source Explorer



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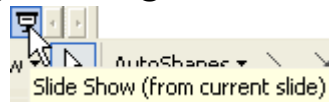
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# Learning DB2 and SQL

- Many (in the thousands of) books exist that do an excellent job teaching SQL.
- Additionally, sites exist on the Internet (GOOGLE: “SQL tutorials” – or “Learn SQL”) for online (and typically free) education.
- IBM Also supplies *excellent* SQL and DB2 documentation:
  - ▶ [DB2 Documentation](#)
  - ▶ [SQL Getting Started](#)
  - ▶ [SQL Reference Manual](#)
  - ▶ [Message \(error code\) Reference](#). [Cached pdf version of full guide](#).
  - ▶ [DB2 Application Development Guide with example embedded SQL programs](#).
  - ▶ [Triggers in DB2](#)
  - ▶ [Constraints in DB2](#)
- And there are plenty of non-IBM sites to learn about SQL:
  - ▶ [Http://en.wikipedia.org/wiki/SQL](http://en.wikipedia.org/wiki/SQL)

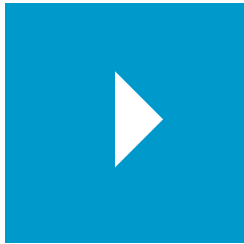
- Note: In order for you to get the above links to work, view the PowerPoint in Slide Show mode.



- Here is an example of COBOL database access:
  - ▶ [http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db29.doc.apsg/db2z\\_samplecobolrdrathreepartnames.htm](http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db29.doc.apsg/db2z_samplecobolrdrathreepartnames.htm)

## UNIT

# The IDz Workbench



## Topics:

- **Connecting to DB2**
- Understanding DB2 objects and dependencies
- Editing and managing DB2 table data
- Coding and testing SQL
- Extract/Load and Managing Test Data & Decision Support

# Why use IDz's Data Tools for DB2/SQL Work?

*We currently use SPUFI/QMF... Why change?*

Two reasons:

## 1. Productivity:

- The IDz Data Tools have vastly superior means of:
  - SQL statement testing
  - Managing your DB2 table test data
    - **Full-screen table editing**
    - **Simple data export/import**
  - Doing DBA tasks
  - Understanding your relational data model
- Easy access from the IDz Workbench
  - The tools are completely integrated into eclipse

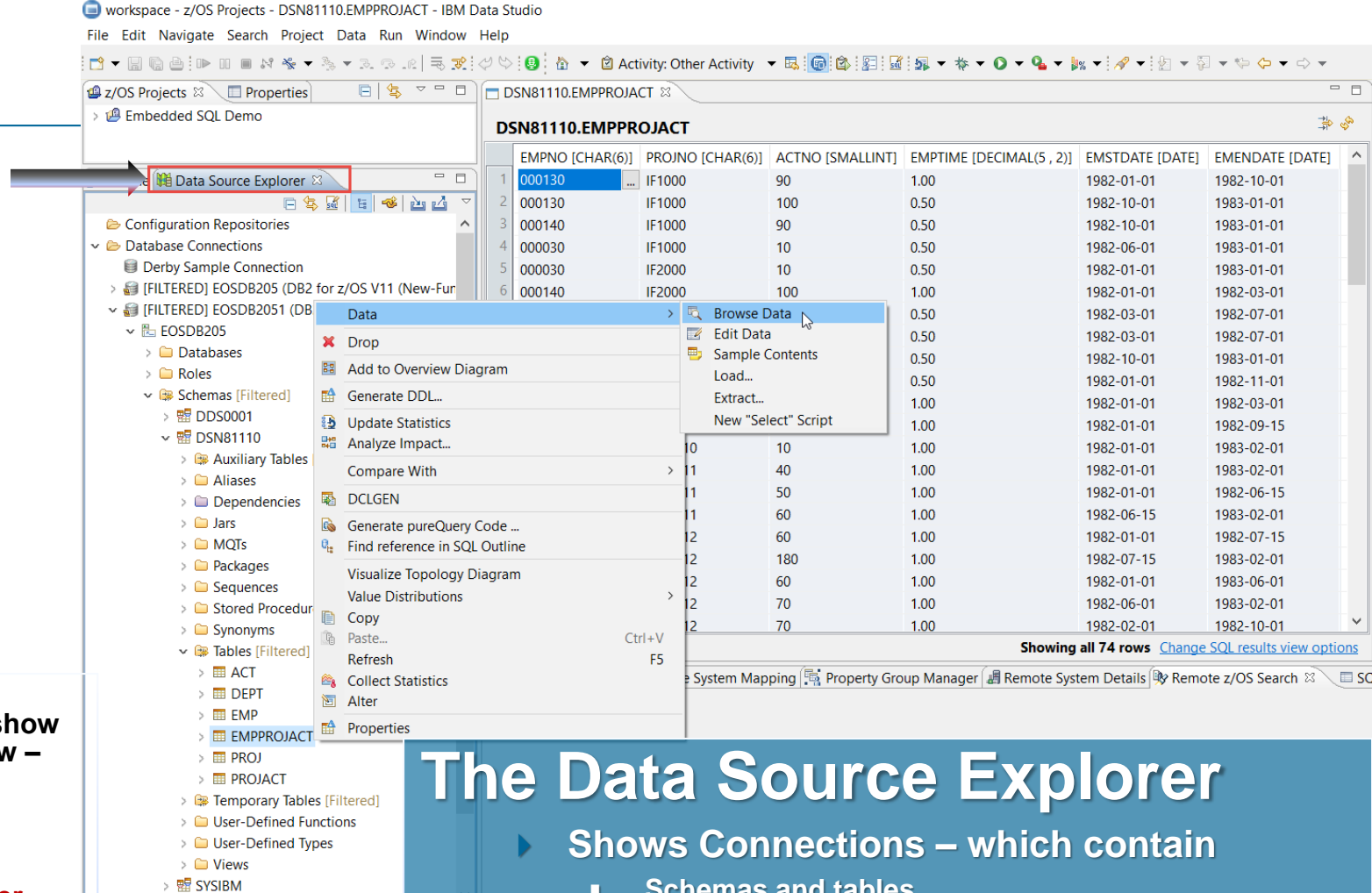
## 2. Cost Savings - z/OS MIPS reduction:

- IDz is substantially less expensive than TSO/SPUFI or QMF for doing DB2/SQL development
- JDBC\*\* Drivers
  - Ziip/Zaap



In place of SPUFI/QMF we'll use the **Data Source Explorer**

# Data Source Explorer DB2/SQL Development Tools



workspace - z/OS Projects - DSN81110.EMPPROJECT - IBM Data Studio

File Edit Navigate Search Project Data Run Window Help

z/OS Projects Properties Embedded SQL Demo

Data Source Explorer

Configuration Repositories

Database Connections

Derby Sample Connection

[FILTERED] EOSDB205 (DB2 for z/OS V11 (New-Fur

[FILTERED] EOSDB2051 (DB

EOSDB205

Databases

Roles

Schemas [Filtered]

DDS0001

DSN81110

Auxiliary Tables

Aliases

Dependencies

Jars

MQTs

Packages

Sequences

Stored Procedures

Synonyms

Tables [Filtered]

ACT

DEPT

EMP

EMPPROJECT

PROJ

PROJACT

Temporary Tables [Filtered]

User-Defined Functions

User-Defined Types

Views

SYSIBM

DSN81110.EMPPROJECT

EMPNO [CHAR(6)] PROJNO [CHAR(6)] ACTNO [SMALLINT] EMPTIME [DECIMAL(5, 2)] EMSTDATE [DATE] EMENDATE [DATE]

1 000130 IF1000 90 1.00 1982-01-01 1982-10-01

2 000130 IF1000 100 0.50 1982-10-01 1983-01-01

3 000140 IF1000 90 0.50 1982-10-01 1983-01-01

4 000030 IF1000 10 0.50 1982-06-01 1983-01-01

5 000030 IF2000 10 0.50 1982-01-01 1983-01-01

6 000140 IF2000 100 1.00 1982-01-01 1982-03-01

0.50 1982-03-01 1982-07-01

0.50 1982-03-01 1982-07-01

0.50 1982-10-01 1983-01-01

0.50 1982-01-01 1982-11-01

1.00 1982-01-01 1982-03-01

1.00 1982-01-01 1982-09-15

1.00 1982-01-01 1983-02-01

1.00 1982-01-01 1983-02-01

1.00 1982-06-15 1983-02-01

1.00 1982-01-01 1982-07-15

1.00 1982-07-15 1983-02-01

1.00 1982-01-01 1983-06-01

1.00 1982-06-01 1983-02-01

1.00 1982-02-01 1982-10-01

Showing all 74 rows [Change SQL results view options](#)

System Mapping Property Group Manager Remote System Details Remote z/OS Search

Ctrl+V F5

Drop

Add to Overview Diagram

Generate DDL...

Update Statistics

Analyze Impact...

Compare With

DCLGEN

Generate pureQuery Code ...

Find reference in SQL Outline

Visualize Topology Diagram

Value Distributions

Copy

Paste...

Refresh

Collect Statistics

Alter

Properties

Browse Data

Edit Data

Sample Contents

Load...

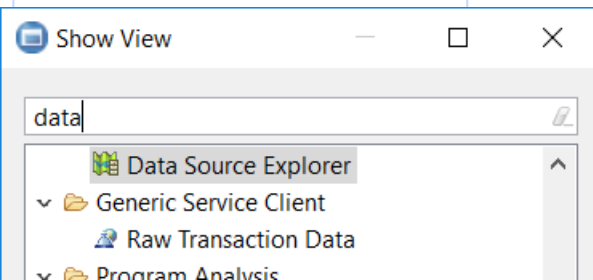
Extract...

New "Select" Script

If your z/OS Projects perspective doesn't show the Data Explorer view – from:

Window →  
Show View → Other

Locate and open the view



## The Data Source Explorer

- Shows Connections – which contain
  - Schemas and tables
  - Processing options
- Data Output
  - Your DB2 Tables/Views are displayed WYSIWYG like Excel spreadsheets
  - And you can access update/cell values – along with adding new rows & deleting rows
- SQL Statement Output
  - Shows the results of running SQL queries

# Data Source Explorer View – Integrated into the z/OS Projects Perspective

By integrating the Data Explorer View into z/OS Projects you can work in one environment on all of the tasks and projects z/OS developers perform – including the three standard DB2 tasks...

The screenshot displays the IBM Rational Developer for System z interface. The main window is titled "z/OS Projects - with Bookmarks View - Untitled\Script1.sql - IBM Rational Developer for System z". The interface is divided into several panes:

- Left Pane (z/OS Projects Perspective):** Shows a tree view of the project structure. A red callout points to the "z/OS Projects Perspective" label. The tree includes "Database Connections", "Derby Sample Connection", and "[FILTERED] EOSDB205 (DB2 for z/OS)". Under "EOSDB205", there are "Databases", "Roles", "Schemas [Filtered]", "Aliases", and "Auxiliary Tables". A red callout points to the "Data Source Explorer" label.
- Top Pane (SQL Statement Edit/Test):** Contains the SQL editor with the following query:

```
select * from DSN81010.EMP E, DSN81010.DEPT D where E.WORKDEPT = D.DEPTNO
order by 5, salary desc;
```

A red callout points to the "SQL Statement Edit/Test" label.
- Right Pane (Remote Systems Explorer):** Shows a tree view of remote systems. A red callout points to the "Remote Systems Explorer" label. The tree includes "New Connection", "Local", "UAT Environment", "z/OS UNIX Files", and "z/OS UNIX Shells".
- Bottom Pane (SQL Results View):** Displays the results of the SQL query. A red callout points to the "SQL Results View" label. The results are shown in a table with columns: Status, Operation, Date, Connecti..., EMPNO, FIRSTNAME, MIDINIT, LASTNAME, WORKDEPT, PHONENO, HIREDATE, JOB, EDLEVEL, SEX. The table shows 13 rows of data, with a total of 42 records shown. A context menu is open over the table, showing options: Copy Row(s), Save, Export, Print, and Convert Row(s) To Hexadecimal. The "Export" option is highlighted.

The status bar at the bottom indicates "Not connected", "Displayed 6 of 6 results: 4 succeeded, 2 failed, 0 terminated, 0 warning, 0 critical error", "<No Current Work>", and "0 Hits".

# What can you do with IDz's DB2/SQL Tools?

The things that you commonly do when developing DB2 applications that access Tables/Views with SQL:

## 1. Investigate and analyze your DB2 Data Model:

- What are the DB2 "objects"?
- How do they relate (what are the dependencies)

## 2. Modify and manage DB2 Test Data:

- Understand what's in your test bed
- Add/Change/Delete/Copy/Paste table values
- Filter table rows and columns \*\*

## 3. Code, test, analyze SQL:

- Interactive
- Embedded \*\*
- Graphical
- Visual Explain \*\*

**Other aspects of the data tools that may be "out of scope" for this session:**

- ▶ DBA Utilities
- ▶ Creating/Deploying/Testing DB2 Stored Procedures
- ▶ Mass Data and Schema migration
- ▶ Working with IMS Databases – through the Data Tools \*\*

**Requires Data Studio**



# IDz's DB2 Data Access Protocol



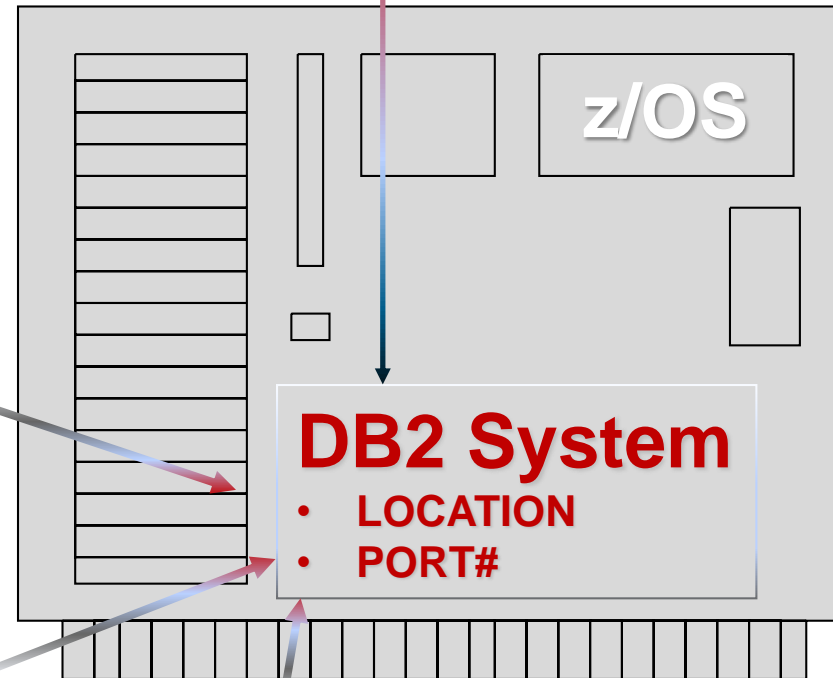
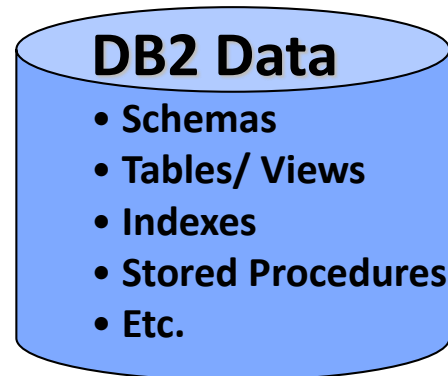
IDz Client Software

IDz Client interacts with DB2 resources through a JDBC driver which connects to DB2/zOS

You connect to DB2 using JDBC drivers – provided by:

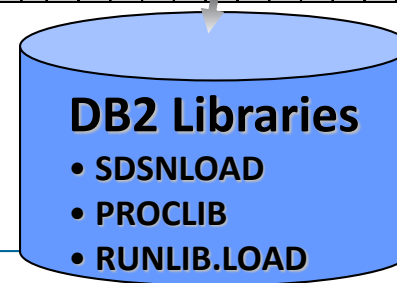
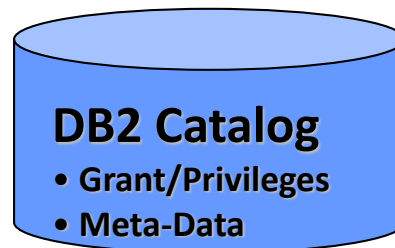
- ▶ IBM/IDz
- ▶ 3<sup>rd</sup> Party

Access to DB2 Tables is defined in the DB2 Catalog thru DBA Grants – not RACF



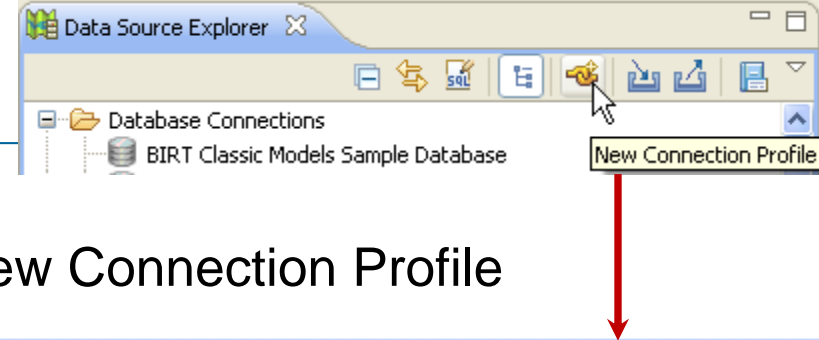
To obtain the Location and Port#

1. From ISPF go to DB2I - Option 7 - DB2 Commands
2. Issue the command:  
**-DISPLAY DDF**



# Connecting to DB2 on z/OS

- Connecting to DB2 on z/OS:
- From the Data Source Explorer – select New Connection Profile
- Select: **DB2 for z/OS** as the database manager
- Enter Properties:
  - **Location:**
    - TCP/IP Location name of the DB2 Server on z/OS (get values from DBA)
  - **Host:**
    - IP Address of the z/OS mainframe
  - **Port:**
    - For DB2 on z/OS
  - **Do NOT check:**
    - Retrieve objects created by this user only
  - **User name/Password:**
    - Required – or use Single sign-on thru your z/OS Host Connection
- Click **Test Connection**, and if successful...Click **Next** >



Connection identification

☒ Use default naming convention

Connection Name: EOSDB205

Select a database manager:

- Cloudscape
- DB2 for i
- DB2 for Linux, UNIX, and Windows
- DB2 for z/OS**
- Derby
- Generic JDBC
- HSQLDB
- Informix
- MaxDB
- MySQL
- Oracle
- SQL Server
- Sybase
- Websphere

JDBC driver: IBM Data Server Driver for JDBC and SQLJ (JDBC 4.0) Default

Properties

General Tracing Optional

Location: EOSDB205

Host: zserveros.centers.ihost.com

Port number: 5443

☐ Retrieve objects created by this user only

☒ Single sign-on

Remote systems: zserveros

User name: dds0001

Password: .....

☐ Save password

Default schema:

Connection URL: jdbc:db2://zserveros.centers.ihost.com:5443/EOSDB205:retrieveMessagesFromServerOnGetMessage=true;emulatePara

**Note that connection values to your DB2 system will be completely different**

# Filtering Schemas

At Data Privacy Modeling – click **Next** >

Your DB2 instance on z/OS, databases could easily contain:

- Thousands of tables
- Hundreds of Schemas

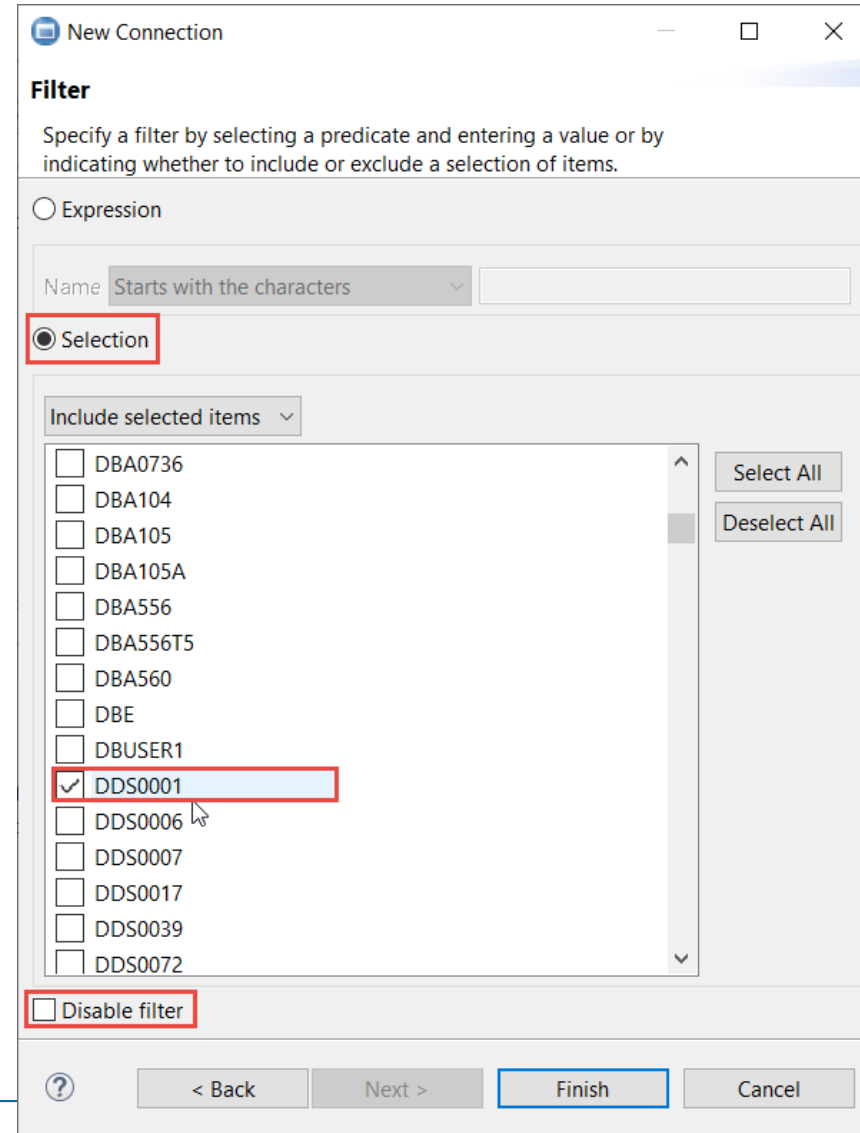
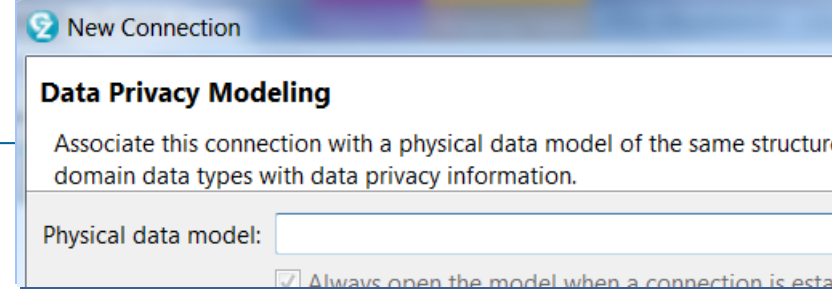
To simplify your work you will - **Filter** the available DB2 objects

1. Un-check: ☐ Disable filter

2. Click ☒ **Selection**

3. Check ☒ <Schema\_Name> for each DB2 Schema you wish to add to your Connection

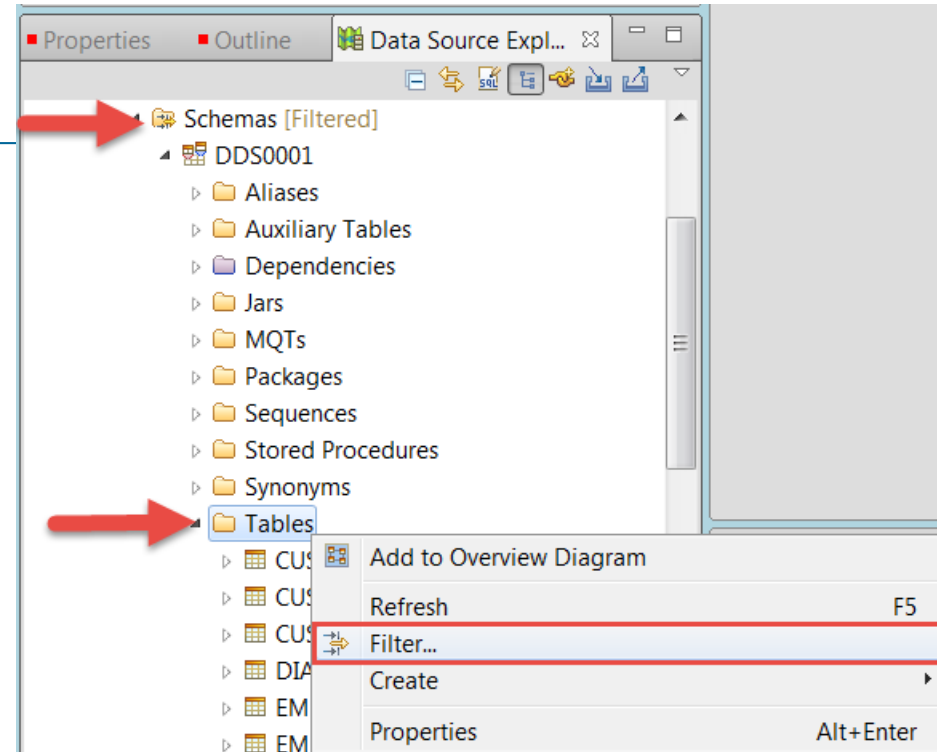
Click **Finish** to create your connection and return to the Data Source Explorer



# Filtering Schemas and Tables

- After you've created your connection you can continue to Filter your DB2 Schemas and/or Tables any time you need →

- ▶ Right-click over Schemas (or Tables)
- ▶ Select Filter...



- ▶ Uncheck: Disable Filter
- ▶ Check: Selection

Decide which tables you want

Click **Apply**

Click **OK**

