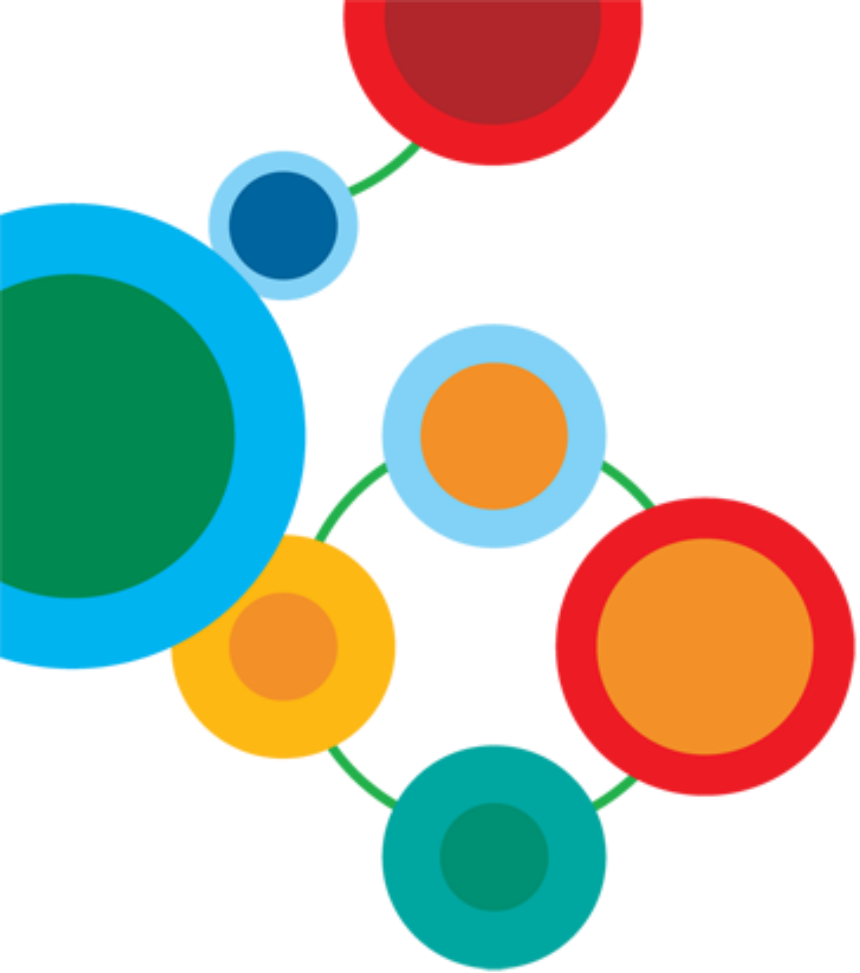


Tuning the Performance of Dynamic SQL on DB2 z/OS: Using IBM Utilities

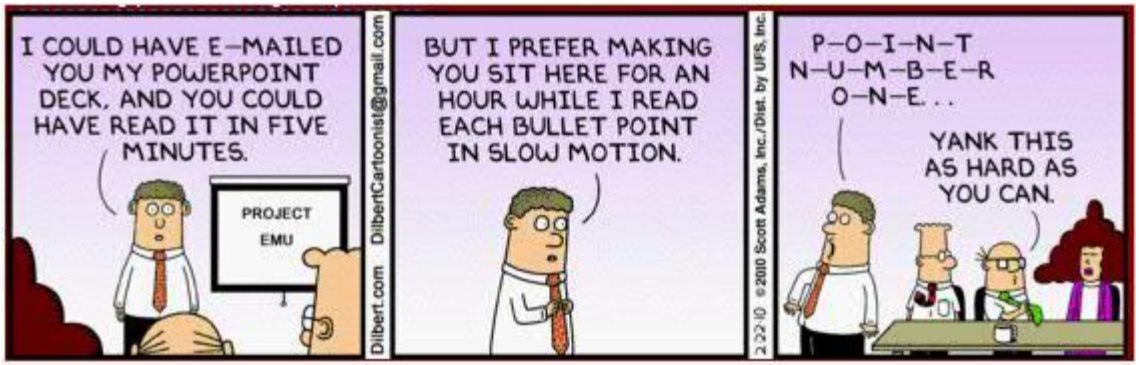
Session: IDZ-1031A

Mike Hood, Nationwide Insurance

IBM Software
Information On Demand 2011

Agenda

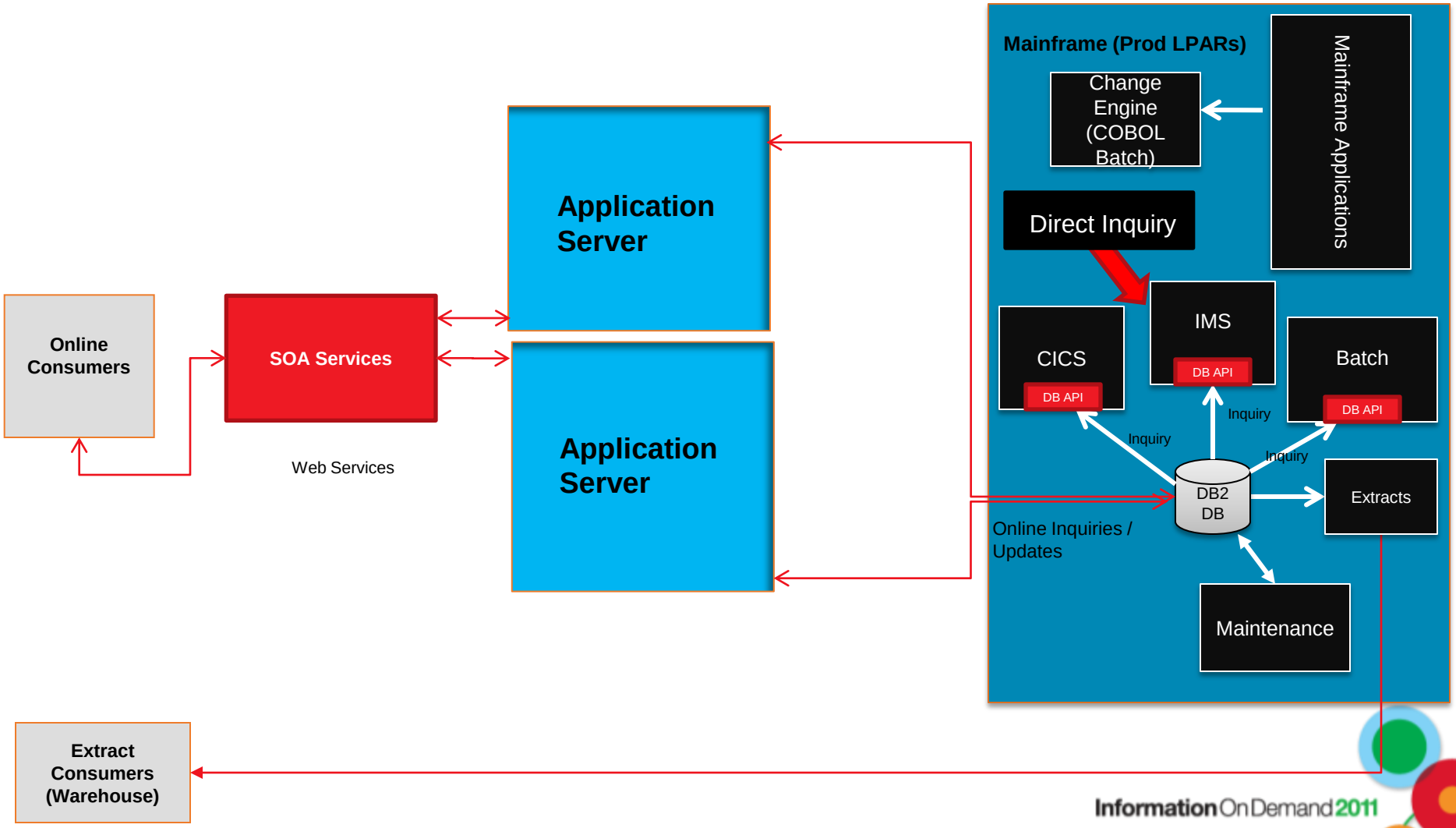
- Dynamic SQL
  - Off Platform Application Calls to DB2 z/OS
  - Driven from Java and other Object Oriented languages
  - Ahdoc Queries
- Poor Performing SQL
  - Multi Table Joins
  - Where END_DT IS NULL
- Tuning Poor Performing SQL
  - Redesign???
  - Reorgs
  - Runstats
  - Optim Data Studio (Explain, Statistics Advisor)


I COULD HAVE E-MAILED YOU MY POWERPOINT DECK, AND YOU COULD HAVE READ IT IN FIVE MINUTES.
PROJECT EMU
Dilbert.com DilbertCartoonist@gmail.com
BUT I PREFER MAKING YOU SIT HERE FOR AN HOUR WHILE I READ EACH BULLET POINT IN SLOW MOTION.
2-22-10 ©2010 Scott Adams, Inc./Dist. by UFS, Inc.
P-O-I-N-T N-U-M-B-E-R O-N-E. . .
YANK THIS AS HARD AS YOU CAN.

BIO

Mike Hood
Consultant, Database Engineering
Nationwide Insurance
20+ Years in Information Technology
4 Years IMS DBA
7 Years DB2 DBA - Customer File

Typical Dynamic Application Architecture (Conceptual)



Where did all of this crazy code come from?

Large sets of Multi Table Joins
Where WHAT is NULL…
Where IT DOES NOT EXIST???

Dynamic SQL

Where does it come from?

- SQL created by Java using code generators such as Hibernate
- Many vendor packages use Java created SQL
- Extension code by in-house Java developers

Dynamic SQL

How did it get on the mainframe?

- DB2 Connect (Plan DISTSERV)
- Via JDBC TYPE 2 or JDBC TYPE 4 drivers
- Packages
  - SYSLH200 Type 2
  - SYSLN200 Type 4

- NOTE: Use JDBC TYPE 4 for best performance for Java based applications – Significant reduction in overhead

Poor Performing SQL

Generated SQL from Java code

- Java Developers code Object Oriented (i.e. Hibernate, Code Generators)
- Developers do not see the SQL
- No correlation between Java code and SQL
- Generates complex SQL
  - Multi Table joins
  - Multi execution of SQL

Tune Poor Performing SQL

Redesign Tables?

Rewrite SQL?

Not Possible?

What's the Solution?

Tune Poor Performing SQL

Alternative?

Tune what you are dealt…

You can effectively tune Dynamic SQL to perform with some very simple steps

Tuning Poor Performing SQL

Some Examples of poor performers

- WHERE END_DATE is NOT NULL
- WHERE END_DATE is NULL
- WHERE LAST_NAME NOT EXISTS

- SELECT CONTACT_ID
  FROM CUSTSEARCH, CUSTOMER, CONTACT
  WHERE CUSTSEARCH.postal_code IN(?, ?, ?)
  AND CUSTSEARCH.x_street_name IN(?, ?, ?)
  AND CUSTOMER.BIRTH_DATE = ?
  AND CUSTSEARCH.contact_id = PERSON.contact_id
  AND CUSTSEARCH.contact_id = CONTACT.contact_id
  AND CONTACT.inactive_date IS NULL

Tuning Poor Performing SQL

Reorgs

- Use DSNACCOX to determine if need exists
  - Use RTS
  - Reorg
  - Runstats

Tuning Poor Performing SQL

Runstats

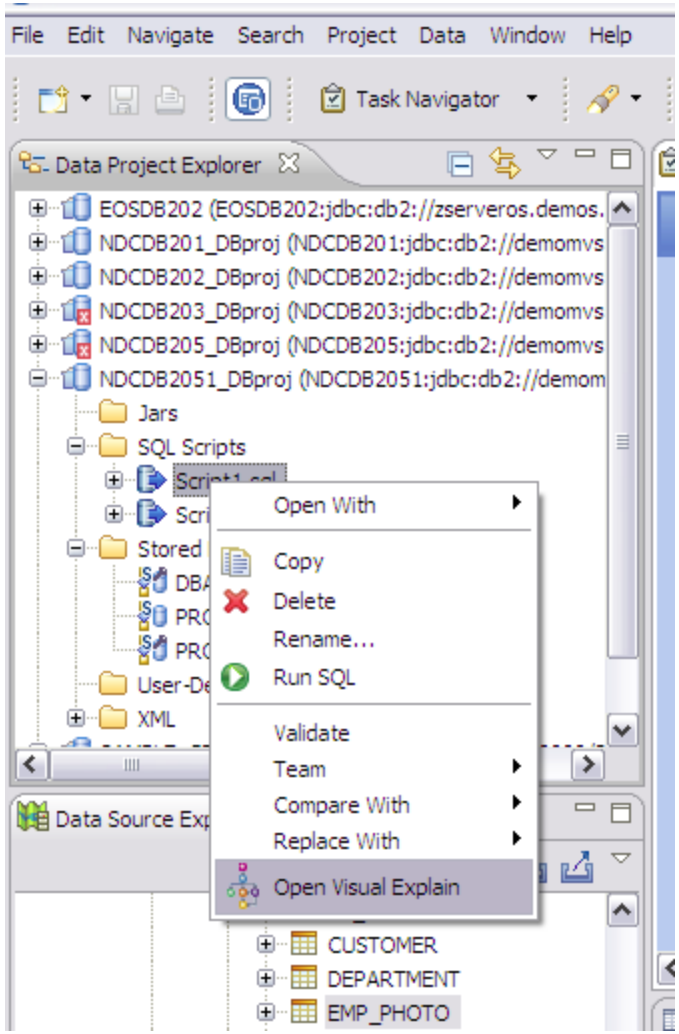
- Use DSNACCOX to determine if need exists
  - Runstats (common with KEYCARD)
  - Current Runstats play a big role in performance!
  - Explain SQL with Data Studio - Visual Explain

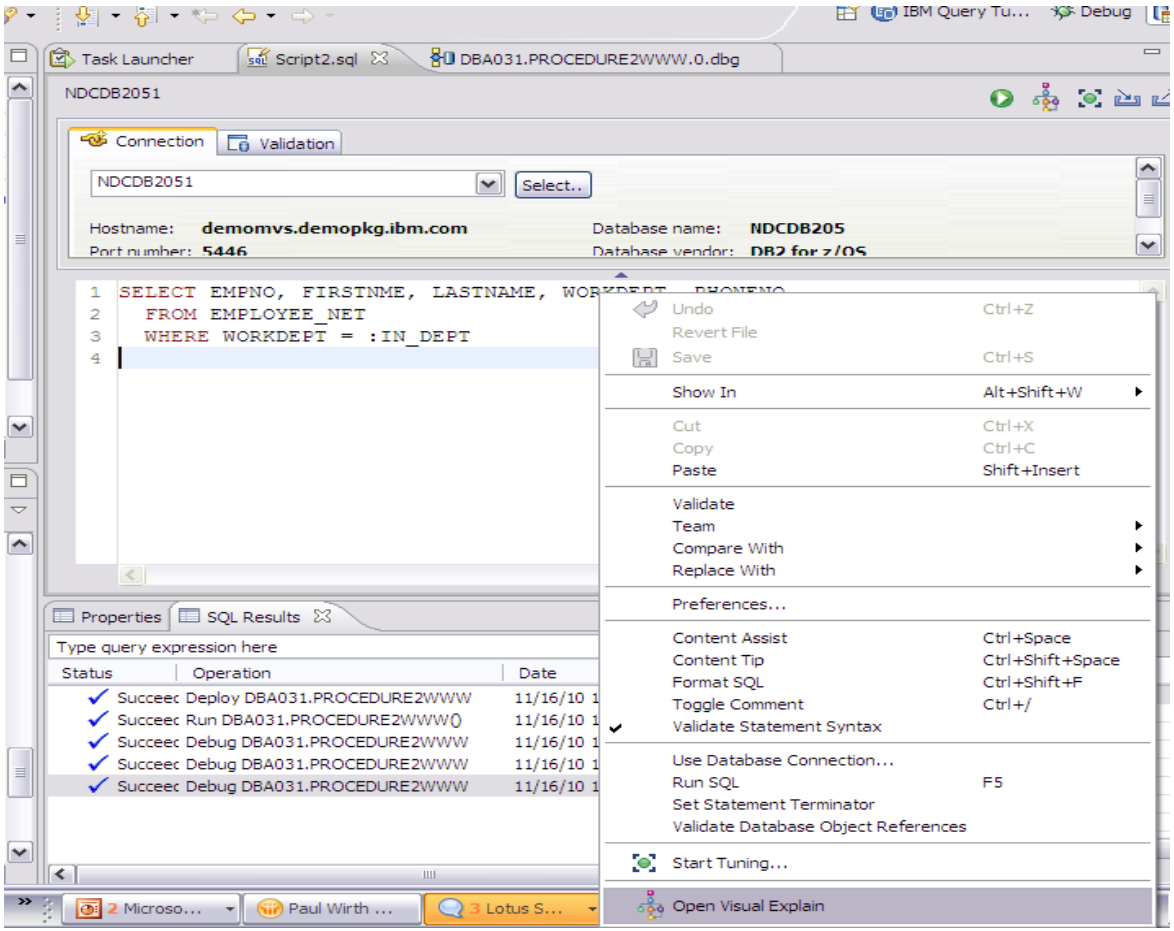
Data Studio

Data Studio is a free tool provided by IBM.

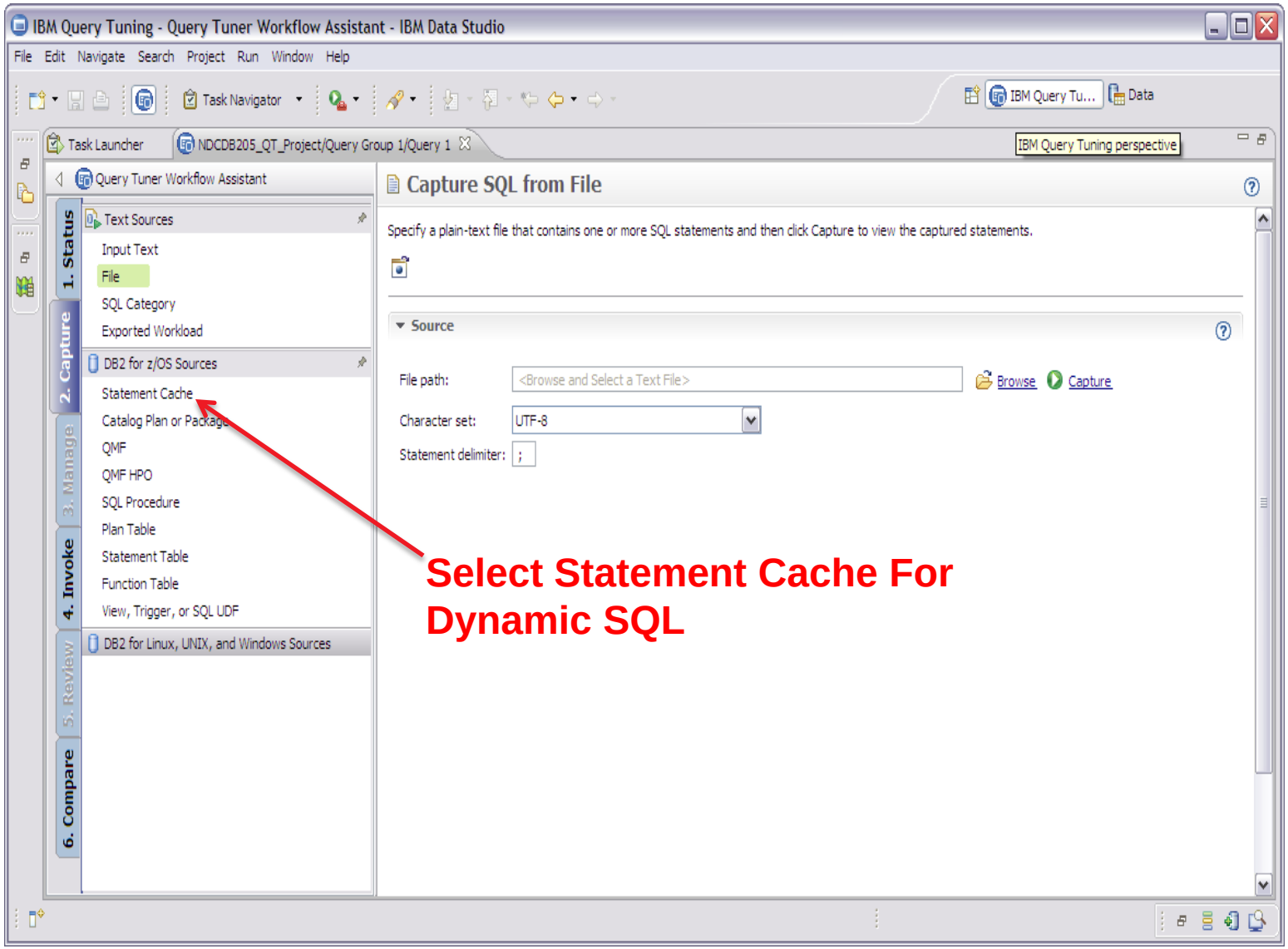
- **Explain facility with Advisors.**
- **Visual Representation of the Access Path**
- **Query Cost Information**
- **Statistics Recommendations**

IBM Data Studio – Visual Explain

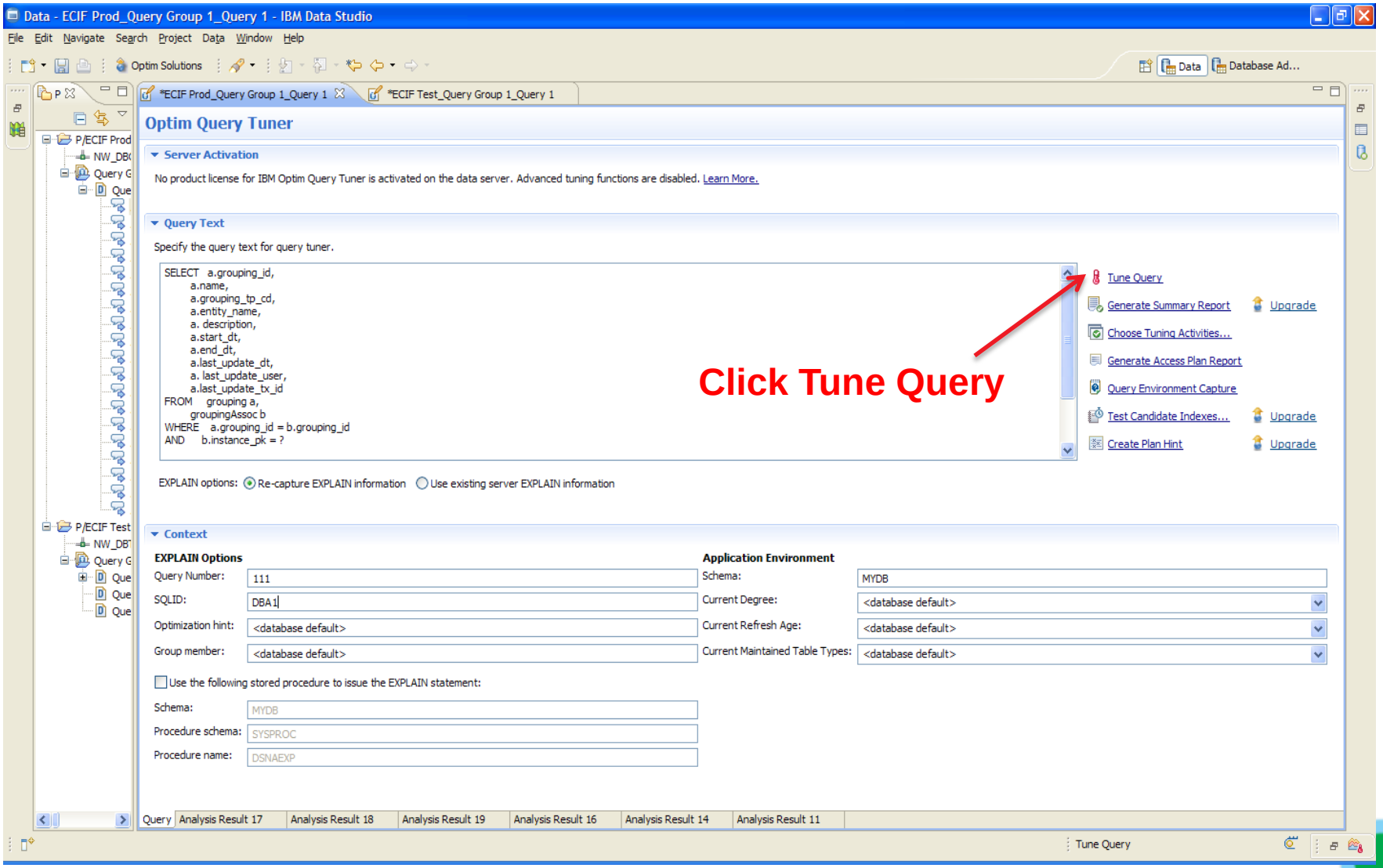




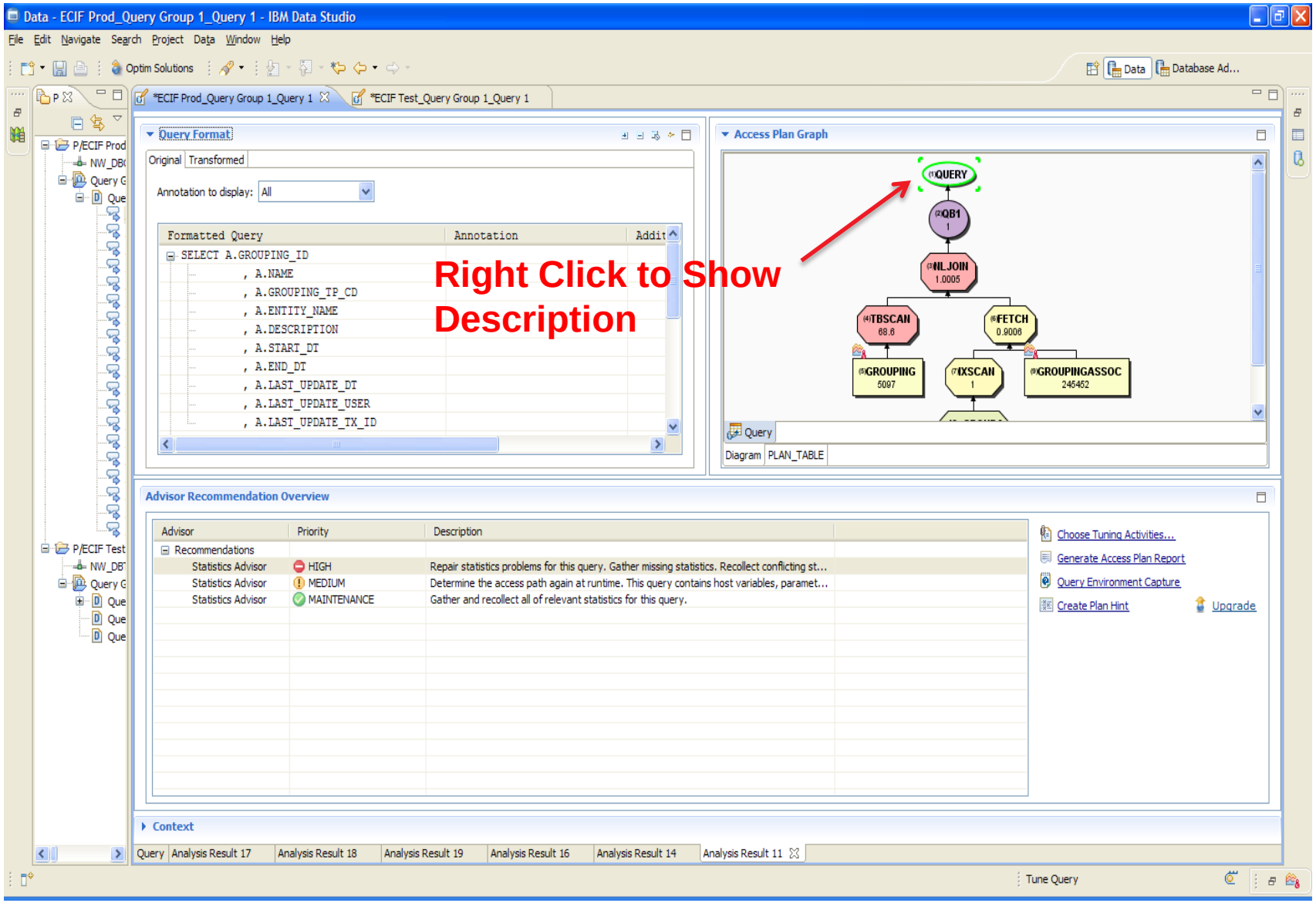
IBM Data Studio – Visual Explain



IBM Data Studio – Visual Explain – Select Query



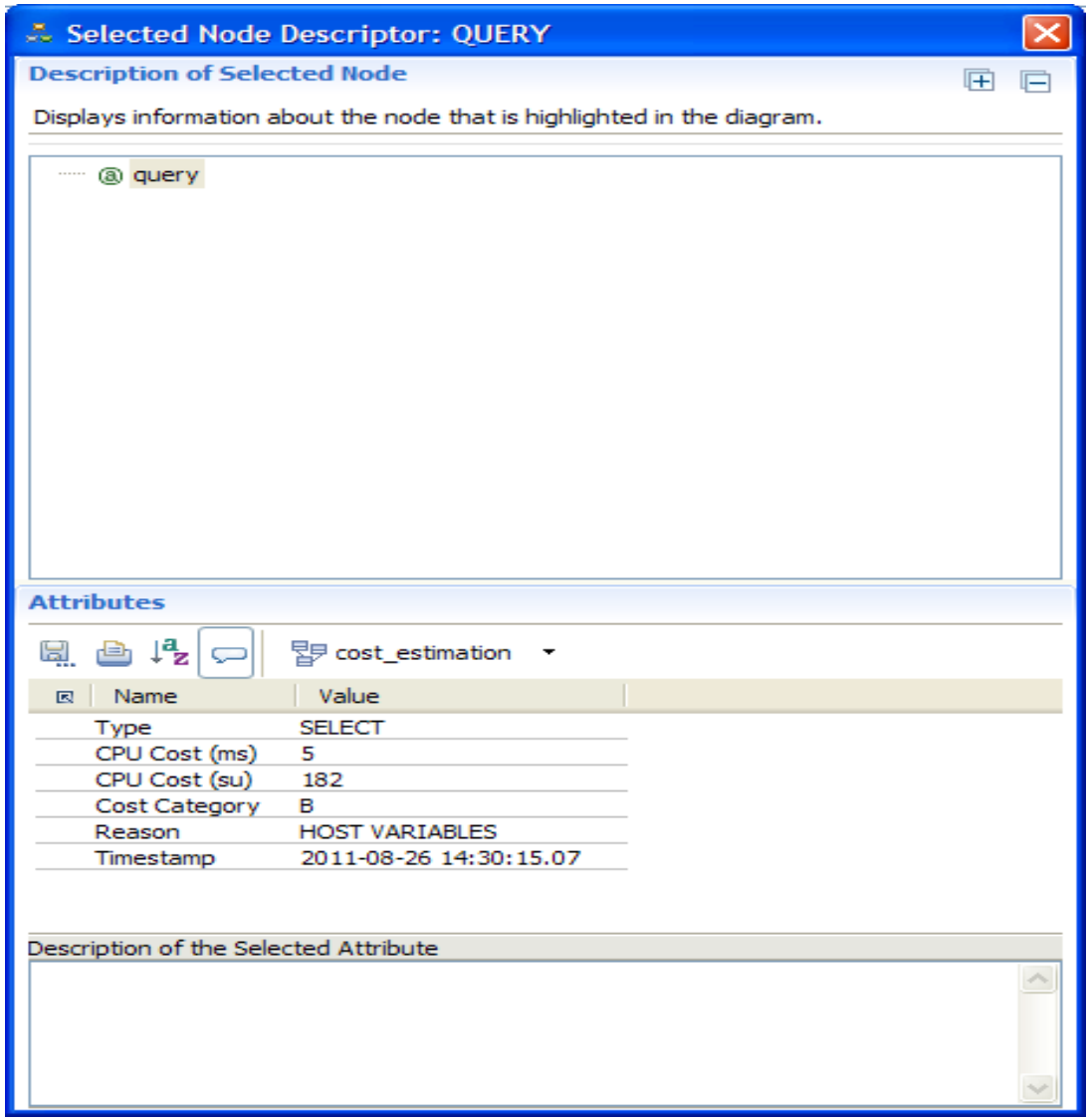
IBM Data Studio – Visual Explain – Explain Results With Advisors



IBM Data Studio – Visual Explain

View Description to obtain costing information

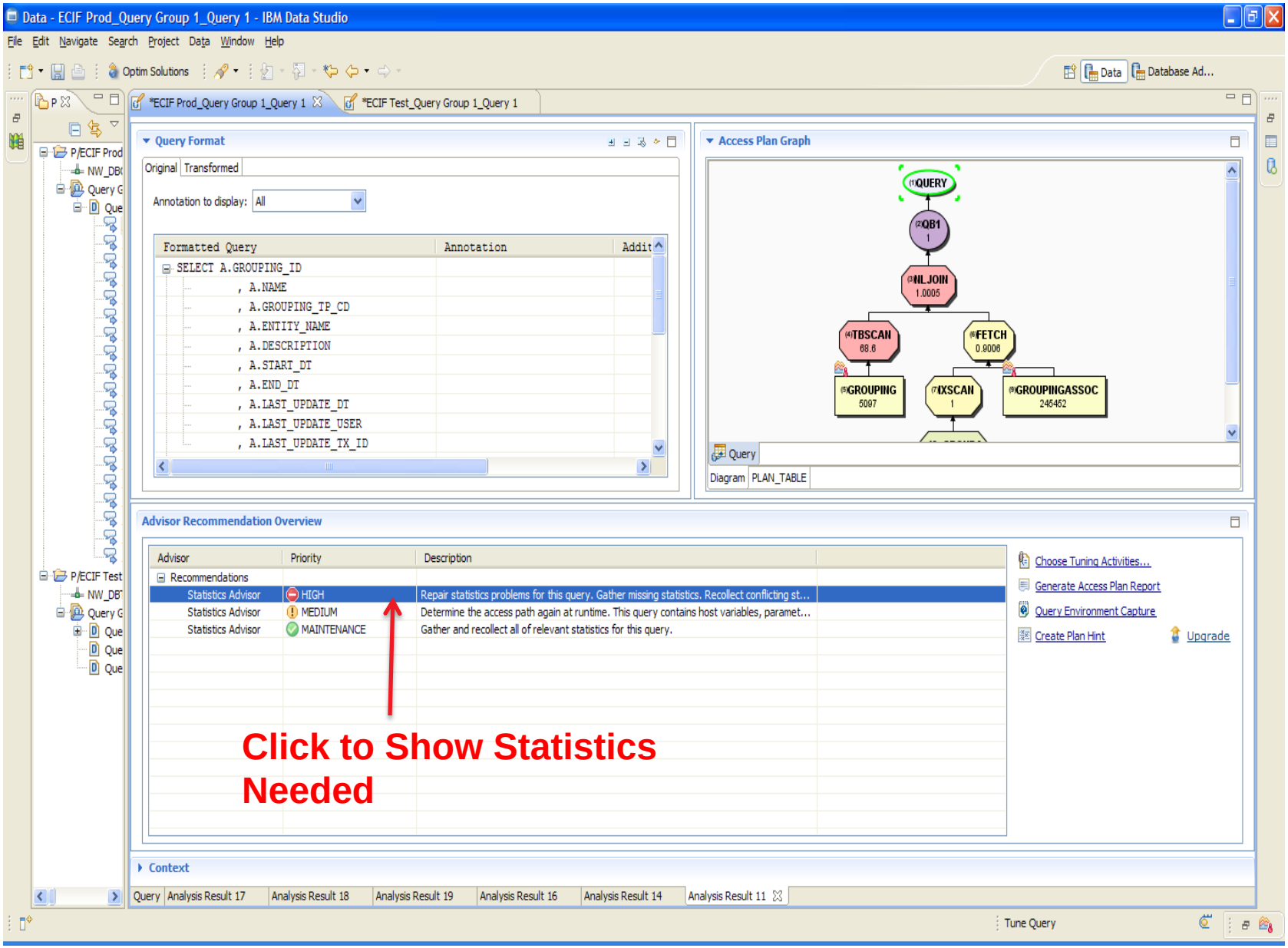
Take note of the Cost in MS, SU. Also Cost Category.



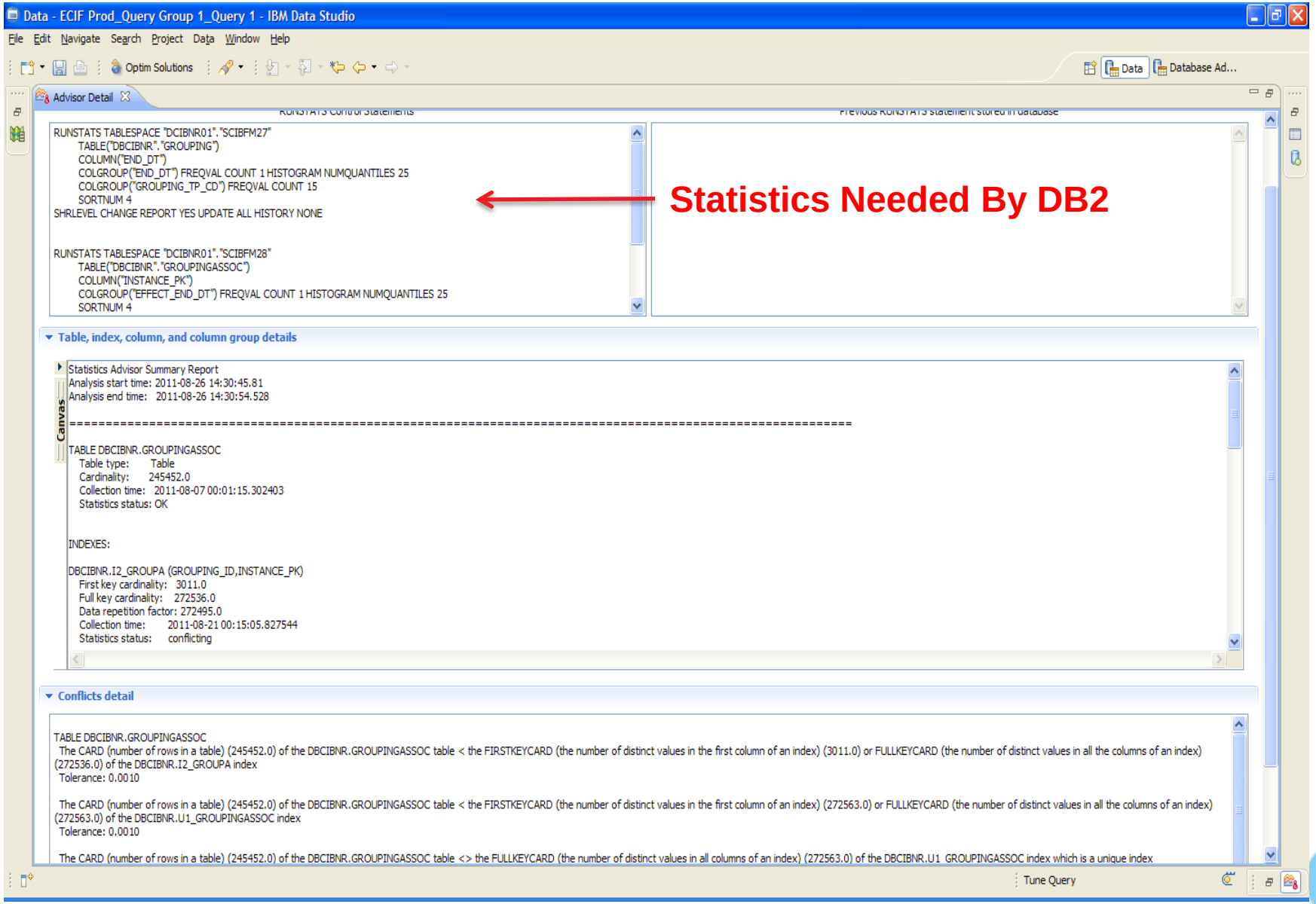
Data Studio – Statistics Advisor

- **Much faster than manually deciding on which stats to collect!**

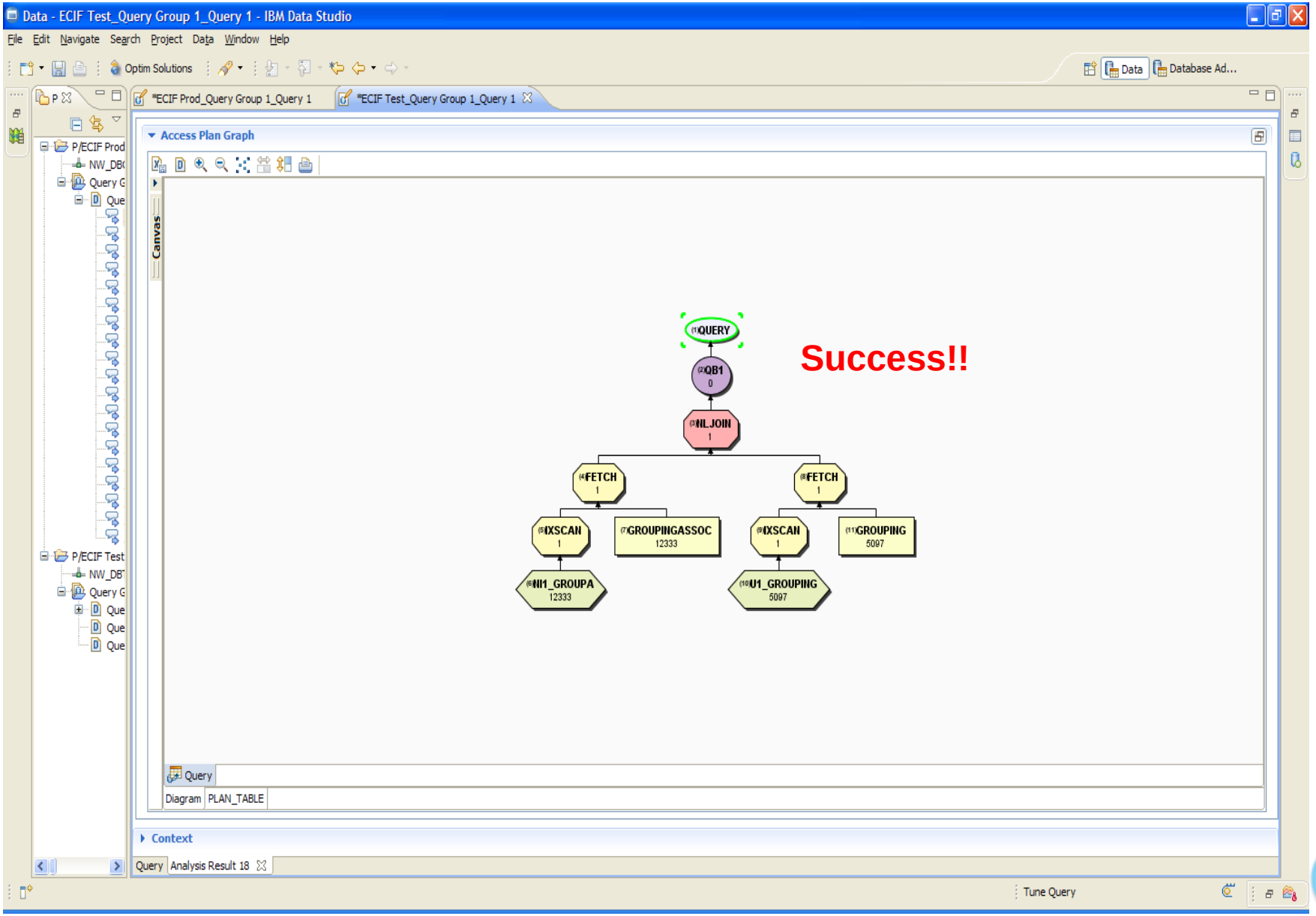
IBM Data Studio – Visual Explain Statistics Advisor



IBM Data Studio – Visual Explain



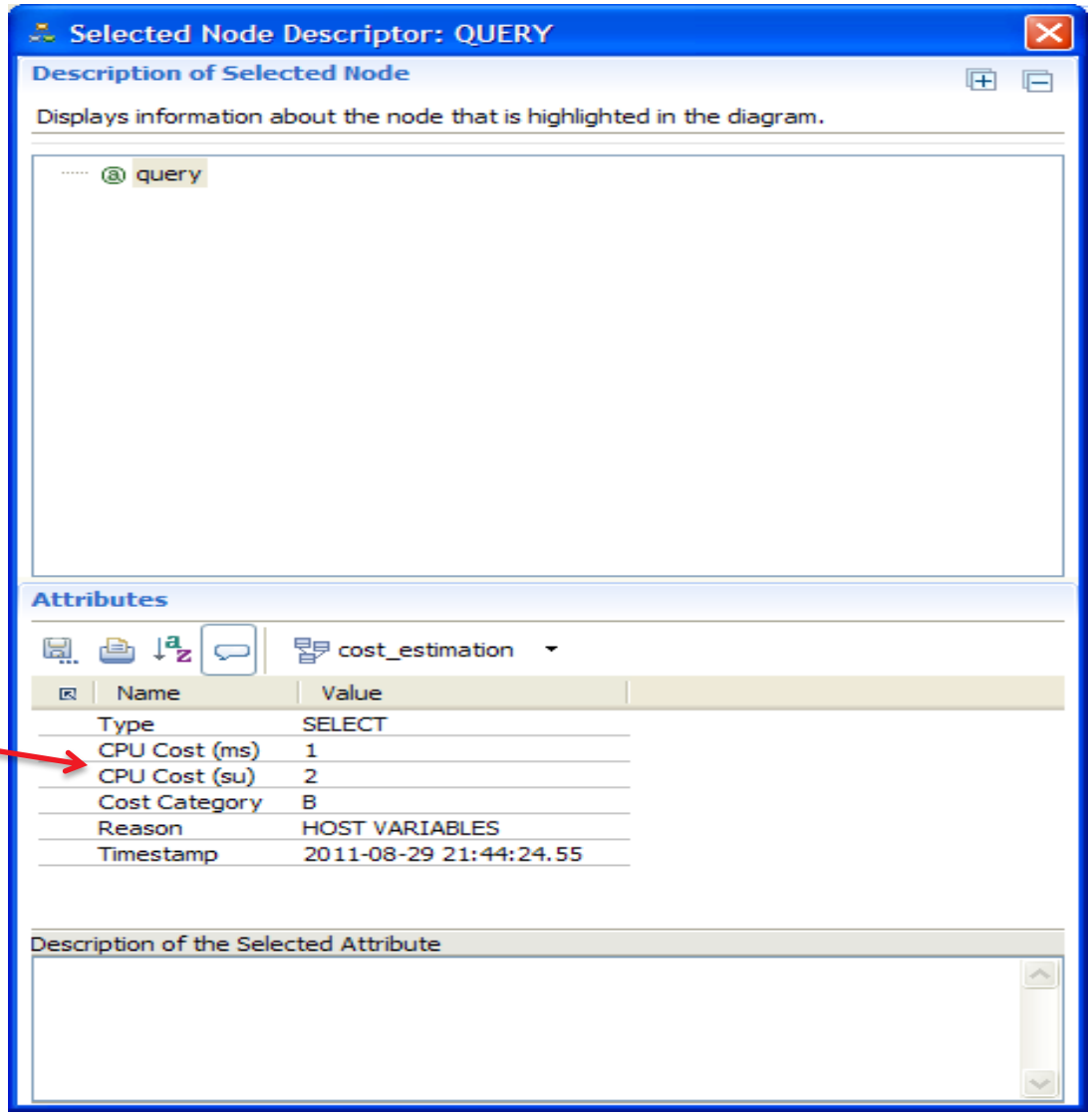
IBM Data Studio – Visual Explain



IBM Data Studio – Visual Explain

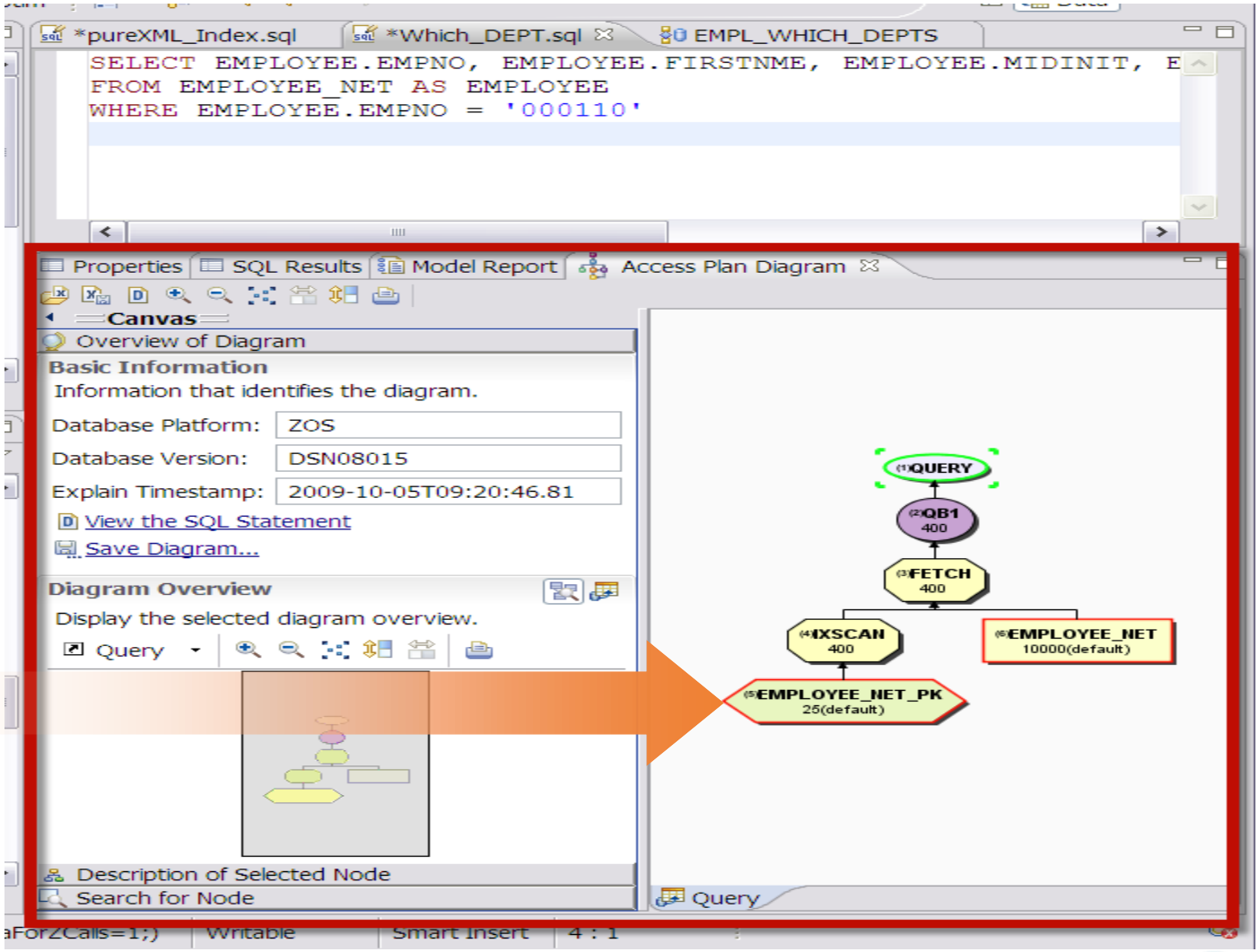
After Correct Statistics are Applied

Note the Cost reduction.



IBM Data Studio – Visual Explain – Missing Statistics

Tip: Red lines around boxes around tables and indexes indicate missing statistics



Tuning the Performance of Dynamic SQL

- High Performance can be Achieved
- Tuning Dynamic SQL to Perform Using Basic Techniques is Possible
- Data Studio Visual Explain is your Friend

Tuning the Performance of Dynamic SQL

- Identify Poor Performers
- Reorganize the Data (If needed)
- Use Data Studio to Explain the Query
- Apply Statistics Advisor Recommendations

Questions??

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