

## LAB 05 – AUTOMAINTEANCE

### A. SYSTOOLS SETUP

Automatic maintenance is controlled with policies that are saved by the GUI into tables in a schema called SYSTOOLS. Let's make these tables and review them:

1. Make sure you position yourself in the C:/POT/05 AUTOMAINT/ directory before continuing
2. Review and run these scripts:
  - Automaint05001.CMD** which executes ⇒ **Automaint05002.DB2**
3. From the Control Center find all tables in the SYSTOOLS schema
4. Review contents of table POLICY
  - There are 5 records in this table
  - Review columns NAME and UPDATE\_TIME to get an idea

Table space	Schema	Index table space
POLICY	SYSTOOLSPACE	SYSTOOLS

MED	DECISION	NAME	UPDATE_TIME	POLICY
DB2CommonMED	NOP	CommonPolicy	Sep 22, 2004 1:01...	COM.ibm.db2.jdbc...
DB2DatabaseRec...	DBBackupDecision	DBBackupPolicy	Sep 22, 2004 1:01...	COM.ibm.db2.jdbc...
DB2TableMaintena...	TableReorgDecision	TableReorgPolicy	Sep 22, 2004 1:01...	COM.ibm.db2.jdbc...
DB2TableMaintena...	TableRunstatsDeci...	TableRunstatsPolicy	Sep 22, 2004 1:01...	COM.ibm.db2.jdbc...
DB2TableMaintena...	StatsProfileDecision	StatsProfilePolicy	Sep 22, 2004 1:01...	COM.ibm.db2.jdbc...

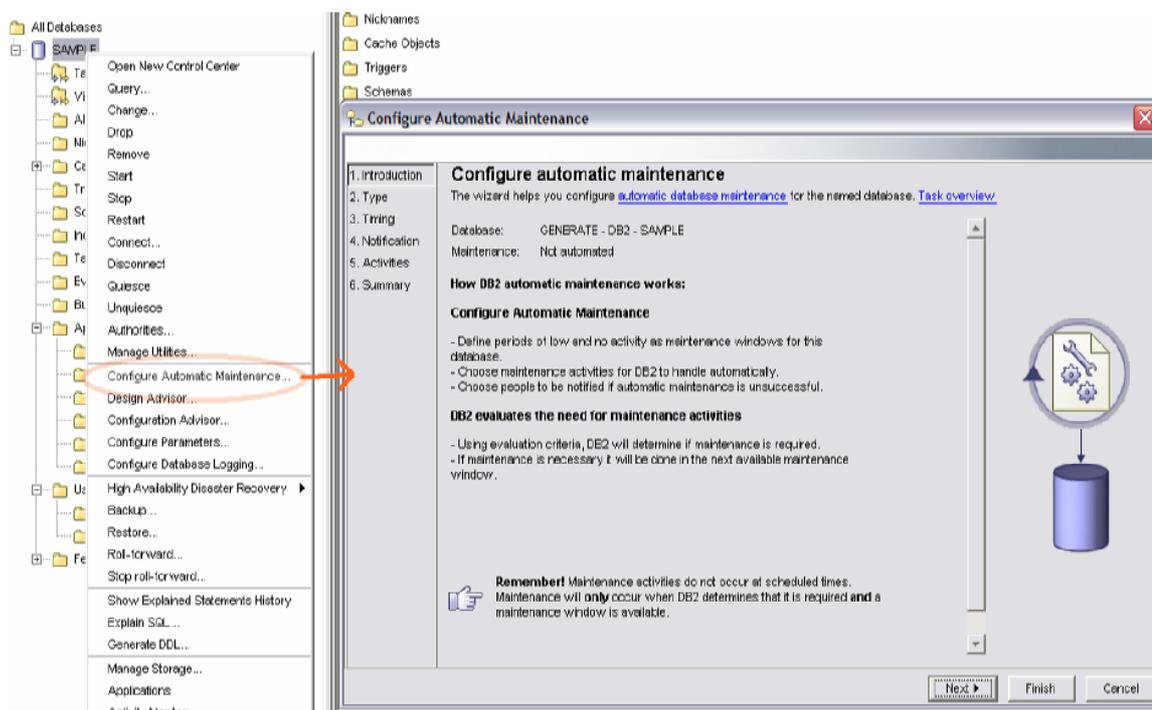
5. Review OPT\_% tables
  - Note: There is no data in them yet

**Note:** DB2 normally creates these tables for you when you first invoke the Automatic Maintenance GUI tool, but we went ahead and did this manually to see what is involved for purposes of understanding it better in this lab, or this could be done if you every want to “start from scratch” in your database.

## B. AUTOMATIC MAINTENANCE - BACKUP

The first automatic maintenance feature we will explore is the backup feature. We're going to go through the motions of setting automatic backup on, but with the time constraints of this lab, we cannot wait for DB2 to do an online backup for us. Still, we can get an idea of what is involved here:

1. Right click on database SAMPLE ⇒ Configure Automatic Maintenance



2. INTRODUCTION page: Read through this
3. TYPE page: Select “Change Automation Settings”
4. TIMING page: [Change] - for online maintenance window
  - START TIME: Choose the hour of the day you are in right now, try to pick a time starting in 15 minutes or so
  - DURATION: 4 hours
  - Leave “Days of the Week” as “All” ⇒ [OK]
  - Your goal here is to pick a 4 hour window starting up about 15 minutes
5. NOTIFICATION page: Skip this for now.
6. ACTIVITIES page: Choose “Automate” on BACKUP line only (make sure REORG and RUNSTATS are not checked this time through)
  - [Configure Settings] ⇒ Choose defaults for all ⇒ [OK]
7. SUMMARY page: Read through then ⇒ [Finish]
8. Review contents of SYSTOOLS.POLICY again and see if your policies changed
9. Review your db cfg parameters for “Maintenance”
  - Right click on SAMPLE ⇒ Configure Parameters, find those like AUTO\_%
  - Which parameters are on and which are off? Why?

**Section Answers:**

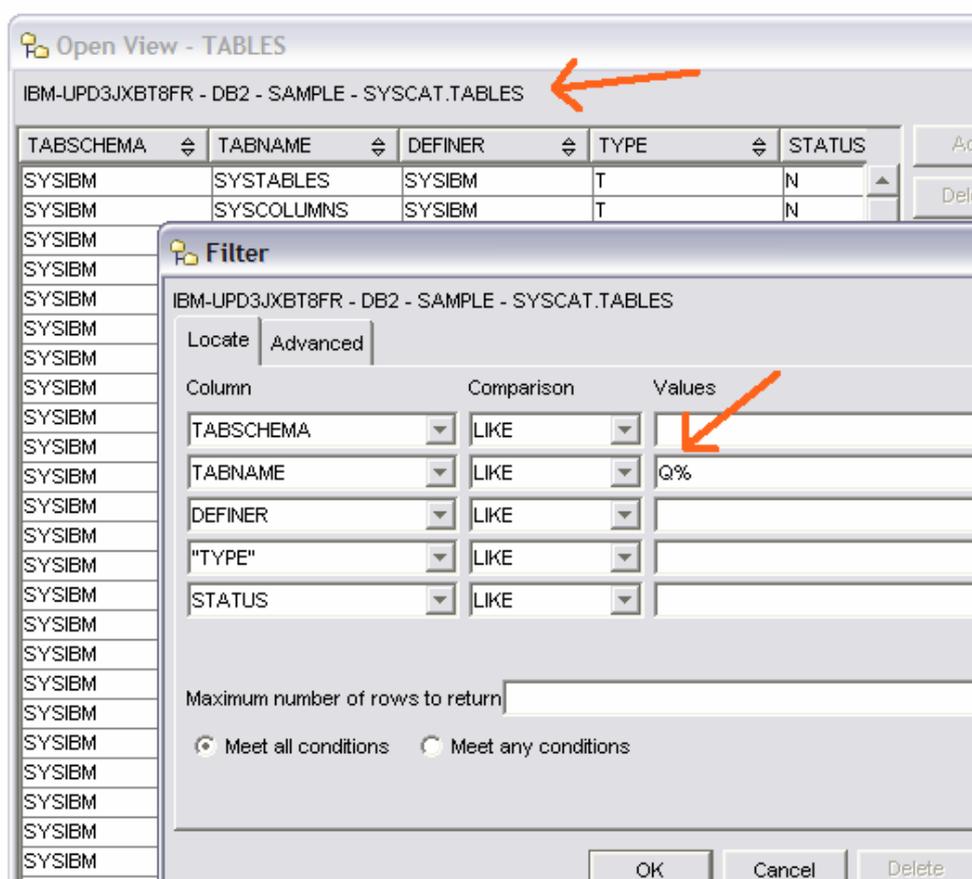
B9. AUTO_MAINT ON	- turns on automaintenance in general
AUTO_TBL_MAINT ON	- turns on table maintenance in general
AUTO_DB_BACKUP ON	- turns on the database backup

### C. AUTOMATIC MAINTENANCE – RUNSTATS & REORG

REORGS and RUNSTATS are the same in the way they are set up for auto maintenance, so we'll just do a RUNSTATS to show how this feature works. We can set up and force DB2 to do RUNSTATS a little easier than REORGS for this lab.

First let's see what the statistics look like for our 4 quarterly tables

1. Find the **SYSCAT.TABLES** view in the Control Center and double click on it
2. While viewing the data, set the filter to select **TABNAME LIKE Q%**



3. Review statistics; especially note STATS\_TIME, CARD, NPAGES, OVERFLOW
4. To do the same thing in batch mode, review and run these scripts:
  - Automaint05003.CMD** which executes ⇒ **Automaint05004.SQL**
  - Review output file: **Automaint05003\_OUTPUT.TXT**

Now let's drop and recreate them so they have *no* statistics

1. Review and run these scripts:

**Automaint05005.CMD** which executes ⇒ **Automaint05006.DB2**

2. Review statistics for these again as you did above by running

- **Automaint05003.CMD** again
- Examine **Automaint05003\_OUTPUT.TXT** file again
- Now you know what a table looks like with and without statistics

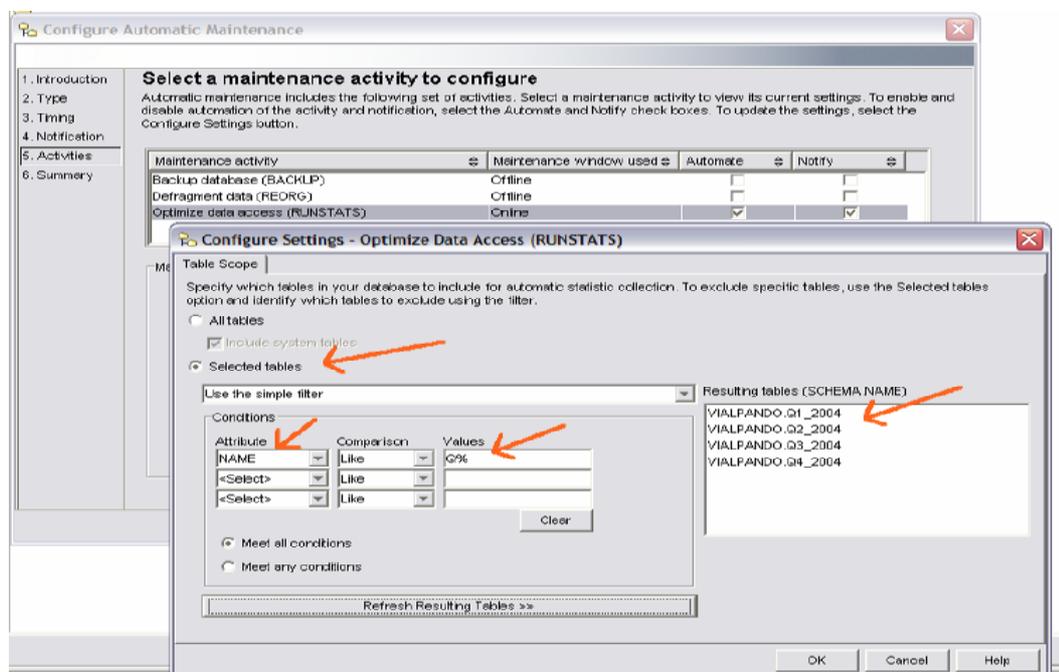
Now let's use automatic maintenance to gather statistics for these tables

1. Return to “Configure Automatic Maintenance” tool

2. Go through each page, but leave how you set the last time through, except...

3. ACTIVITIES page: Choose “Automate” on RUNSTATS line only (uncheck others)

- Select [Configure Settings] button ⇒ Selected Tables ⇒ Simple Filter
  - NOTE: As an alternative, some in this PoT class may choose “All Tables” instead of the “Selected Tables” option. In fact, it would be good to have both represented in the PoT
- Attribute “NAME”, Comparison “LIKE”, Value ‘Q%’
- [Refresh Resulting Tables] ⇒ you should see your 4 tables here ⇒ [OK].



4. SUMMARY page: Review for changes to this, then ⇒ [Finish]

DB2 will now update the statistics for the selected tables sometime within 120 minutes of the start window of your maintenance period. We'll go back to this later (like say after lunch) to check the results of the automatic runstats you have configured. To check how DB2 is doing, you can run this script again until you see the DB2 engine automatically do the work for you: **Automaint05003.CMD**

- Review **Automaint05003\_OUTPUT.TXT**

**Note: For purposes of saving time, you can now start LAB 06, Section A: "Setup CARS Tables Example". Run the script in that lab as soon as you like before the next presentation begins.**

#### **D. EXTRA EXERCISES – PROFILING**

DB2 RUNSTATS has the concept of profiling, which is just a way of saving the last way you ran RUNSTATS in your catalog and using it instead of the entire command all over again.

1. To see a simple way of how this works, execute these commands any way you wish:
  - **RUNSTATS ON TABLE [your user id].Q1\_2004 ON ALL COLUMNS SET PROFILE**
  - **RUNSTATS ON TABLE [your user id].Q2\_2004 WITH DISTRIBUTION TABLESAMPLE BERNOULLI(30) REPEATABLE(4196) SET PROFILE**
2. Now execute and review the output from this script again: **Automaint05003.CMD**
  - In output file **Automaint05003\_OUTPUT.TXT**, pay special attention to column **PROFILE**
3. To use a previously set profile, run this command:
  - **RUNSTATS ON TABLE DBAPOT.Q2\_2004 USE PROFILE**

**Note: The above is the "manual" profile methodology.**

DB2 Auto Maintenance allows you to collect statistics automatically by doing this:

```
UPDATE DB CFG USING AUTO_STATS_PROF ON
```

This updates the SYSTOOLS.OPT\_FEEDBACK% tables. You can manually review the OPT\_FEEDBACK\_RANKING to review DB2 recommendations for these tables. To have DB2 automatically update your profiles, use:

```
UPDATE DB CFG USING AUTO_PROF_UPD ON
```

For automatic profiling, automatic maintenance only updates once every 7 days.