

Database Tuning: Using The AS/400 SQL Database Monitor to Determine Advised Indexes

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Editor's Note: In the endless quest for performance tuning, there are many twists and turns along the way. Jean Driscoll takes this opportunity to straighten the road a bit by teaching us how to use IBM's DB Monitor to find out where we should build indexes to speed up our data access.

Many PeopleSoft customers have been complaining about AS/400 performance since upgrading to operating system V5R2. In trying to determine the problem area, it is a good idea to do some database troubleshooting.

OneWorld uses SQL, Structured Query Language, in order to carry out its commands against the various servers that it supports. When an SQL statement is executed on the AS/400, before execution, the AS/400 does some preliminary work to determine which access path should be used in the execution of the SQL statement. The AS/400 query optimizer does this work.

For tables on the AS/400, an index can be built to create a faster access path to the data. Sometimes, the AS/400 will build this index temporarily, on the fly, just to give back results to a single SQL statement. If the statement is run again, the index is built again, each time using CPU cycles and other resources. If the statement is run a lot, then in order to save these resources it may be better to create a permanent index. The AS/400 SQL engine has a

built-in index advisor that gives you the information you need in order to create a permanent index.

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IBM has created what is called the Database Monitor for troubleshooting SQL and tuning your database. This tool can be used for any software running on the AS/400 that uses SQL, like OneWorld or Showcase Query or many other client/server type packages. IBM has not advertised it much, but it is a strong tool for watching SQL activity. If you call IBM with a database problem, they will have you run the Data-

base Monitor and send an output file to them for analysis. IBM provides two tools for creating and reading this file: the Operations Navigator SQL performance monitor, and then a more manual approach, using AS/400 commands then Query/400. For either approach you will need to start an AS/400 emulation session to perform some AS/400 commands.

Following are the steps involved to run this advisor, the Database Monitor, either using Client Access' Operations Navigator or using AS/400 commands. In order to use either tool, first you have to determine which job on the AS/400 is executing the SQL statement. The AS/400 DB monitor can be run for a specific job or for *ALL jobs. It should be run for *ALL jobs occasionally to see if there is any tuning that can be done for normal work activity. However, most of the time this procedure is run for a specific job. A specific job is defined by Job Name, Job Number, and User.

The steps for tuning your database are:

- Determining The Job To Monitor
- **Either** Using the DB monitor – Using Operations Navigator
- **Or** Using The DB Monitor – Using AS/400 Command Line
- Creating Indexes

Determining The Job To Monitor

For OneWorld, this would be either submitted UBE jobs or for Applications, the QZDASOINIT jobs. Depending on which system you want to monitor, sign onto a OneWorld environment that accesses that system. Determine what job is running the SQL statement that you want optimized. The steps differ for Applications and UBEs.

OneWorld Applications.

When you sign onto OneWorld, the system user associated with your user ID attaches to half a dozen AS/400 pre-start jobs named QZDASOINIT. The problem is determining which of these jobs out of the 750 running on the system are the ones that you are attached to, and which one will run the SQL statement.

1. Within OneWorld, use the User Security option of User Profiles to determine which system user your OneWorld user profile is using. You may want to set up a special testing user profile and related system user so that finding your AS/400 QZDASOINIT jobs is easier.
2. On an AS/400 emulation session, Use WRKOBJLCK system user *USRPRF command in order to determine which jobs the system user is attached to. Use a '5' in front of all of the jobs that appear, rolling down to find all of them.
3. From your PC Start Menu, use Run/CMD to get a DOS prompt, then use IPCONFIG to see what IP address you are using.
4. Back on the AS/400 press ENTER, then for each job use options 10, Display Job Log, to see what IP is attached to the job, then option 13 to see which library that particular connection is attached to. For most queries, you will be looking for the QZDASOINIT job that is using your IP address that has data as the last entry in the library list (the library defined for the data source that holds your business data for the environment you are debugging). If you are debugging your Production data, for example, the library you are looking for under option 13 is PRODDTA, if you use PeopleSoft standards.
5. The Job name, User, and Number are at the top of both of these screens. See Figures 1 & 2.

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Job . . . : QZDASOINIT      User . . . : QUSER          System: HRCPROD
Number . . . : 023705

Job 023705/QUSER/QZDASOINIT started on 12/14/03 at 05:12:22 in subsystem
QUSRWRK in QSYS. Job entered system on 12/14/03 at 05:12:22.
User SYSUSER from client 172.16.3.164 connected to server.

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Figure 1: WRKJOB option 10. Display Job Log

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Display Library List
Job: QZDASOINIT      User: QUSER          Number: 023705      System: HRCPROD

Type options, press Enter
  b=Display objects in library

Opt  Library      Type      ASP
    -  QSYSMODS     SYS       Device
    -  QSYS        SYS
    -  QSYS2       SYS
    -  QHLPSYS     SYS
    -  QUSRSYS     SYS
    -  SECLIB      SYS
    -  QIWS        PRD
    -  PRODDTA    USR
Text
    -  Programs for the system library list
    -  System Library
    -  System Library for CPI's
    -  System Library for Users
    -  Security implementation temp library
    -  Production Env. Data Tables

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Figure 2: WRKJOB option 13. Display Library List

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