Toad for the DBA: Log Switch Frequency Map

There will be times when a database seemingly slows down due to unusually high insert, update or delete activity. That’s not to say that there’s anything inherently wrong with such a workload, just that sometimes your database will experience unusually high loads. For the DBA, knowing when such atypical workloads occur can often be helpful as an initial first step in troubleshooting database performance in general. Think of it this way: sometimes driving to work takes longer than usual – not because you’re doing anything wrong driving or because of automobile mechanical difficulties, but rather due to heavy traffic. The same can be true for the database, and knowing this can help define an important context when performing database diagnostics work.

Toad makes this analysis dirt simple.

Let’s examine the Toad Log Switch Frequency Map screen. You can launch this screen via the Main Menu - > Database - > Diagnose - > Log Switch Frequency Map, as shown in Figure 1.

![Figure 1: Launching Toad's Log Switch Frequency Map](image)

The Toad Log Switch Frequency Map screen, shown in Figure 2, is a fairly straightforward screen to use. It merely displays a nice little data grid organizing and showing the number of redo log file switches that occurred by hour of day for the recent past. Look again at Figure 2, specifically at column #13 for the first row of data. On Friday the 13th around 1:00 PM my database experienced an unusually high workload that resulted in many times my normal redo log spin rate. And yes, I waited until a Friday the 13th and chose the 13th hour to be cute. Research into what was happening yields that I was running some really big batch jobs to create and populate tables. As I stated before, there’s nothing wrong with such a workload. But now that I know this, my ensuing database performance and diagnostic actions now have a well defined context. So in this case rather than looking for some expensive SQL SELECT statements that might normally slow a system down, I can instead focus my efforts in examining INSERT, UPDATE and DELETE commands for alternative and superior coding. I also might look into the overlap of the batch jobs as well as their parallel nature (or lack thereof).
What kinds of additional questions might this screen help one to resolve? If there was a very heavy redo log switch rate (such as with a nightly data warehousing batch cycle where the logs might switch hundreds or even thousands of times per hour, the DBA could now ask questions such as:

Are the redo log files deployed on a poor IO characteristic platform (e.g. RAID 5) for the workload – i.e. heavy writes
Are the redo log files appropriately sized for the nature of the workload, such that log switches occur no more than every 20 minutes (or whatever your criteria is)
Should we consider Solid State Disk (SSD) or some other high speed IO platform to support the typical peak sustained redo log IO and switches

Returning the earlier automobile driving analogy, the Toad Redo Log Switch screen yields historical information like your cars computer – such as when your average speed and fuel consumption was highest. That way you can amend your driving (and database) to obtain the best results. And at the very minimum, you’ll know when you ran into those annoying traffic jams – because you can see that you moved at just 5 MPH average.

About the Author

Bert Scalzo is a Database Domain Expert for Quest Software and a member of the TOAD team. He has worked extensively with TOAD’s developers and designed many of its features. Mr. Scalzo has worked with Oracle databases for well over two decades, starting with version 4. His work history includes time at Oracle Education and Oracle Consulting, plus he holds several Oracle Masters certifications. Mr. Scalzo also has an extensive academic background - including a BS, MS and PhD in Computer Science, an MBA and several insurance industry designations. Mr. Scalzo is an accomplished speaker and has presented at numerous Oracle conferences and user groups - including OOW, ODTUG, IOUGA, OAUG, RMOUG, et al.
His key areas of DBA interest are Data Modeling, Database Benchmarking, Database Tuning & Optimization, "Star Schema" Data Warehouses and Linux. Mr. Scalzo has written articles for Oracle’s Technology Network (OTN), Oracle Magazine, Oracle Informant, PC Week (eWeek), Dell PowerEdge Magazine, The Linux Journal, www.linux.com, and www.orafaq.com. Mr. Scalzo can be reached via email at bert.scalzo@quest.com or bert.scalzo@yahoo.com.

Bert was recently added to the elite list of Oracle ACEs. Oracle ACEs are known for their strong credentials as Oracle community enthusiasts and advocates, with candidates nominated by anyone in the Oracle Technology and Applications communities.