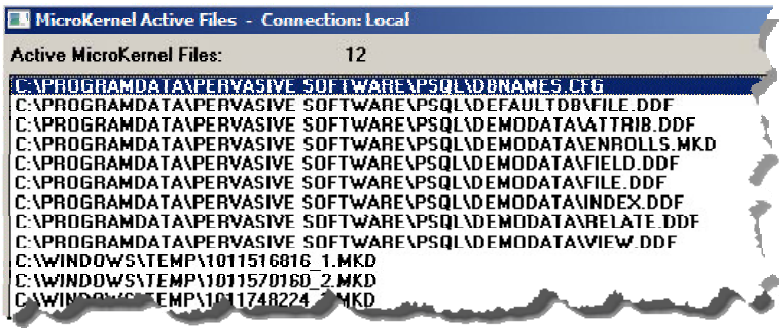
Tech Tip #7: Backing Up Your Database Files: Beginner Options

Overview: Determining file locations and ensuring proper backups

By now, your PSQL database should be humming along nicely, using OS resources and database cache effectively. However, a huge disaster lurks just around the corner! Computers are notoriously fickle, and a power failure, hard disk crash, or malware attack can render your entire system unusable in a heartbeat.

To counter these threats, you need to be making regular backups of your PSQL data (and applications, of course). In this Tech Tip, we're going to review a few simple options for getting a valid backup of your system, utilizing both a complete shutdown, as well as one option for 24x7 systems.

When backing up your system, you need to know exactly where the database files are located. Check your application documentation for details, but if you are not sure, break out the **PSQL Monitor** tool and check the *Microkernel/Active Files* screen.



This screen shows you exactly what files are open at any given time, and can be used as a good starting point to knowing what needs to be backed up.

To obtain a complete backup, the BEST option is to get all users out of the engine first. Once everyone is out, all of the files will be closed (i.e. the screen above will be blank). From there, your backup system should have no problem getting a complete snapshot of the entire system. Since all users are out, the files are closed, and no other special processing is needed. Easy as approximately 3.14159!

If you have a problem getting all users out at the end of the day, you can shut down the engine, but this also wipes out the database cache, so it is not an ideal solution. It is better to use the **PSQL Monitor** to delete all database sessions, or you can leverage Goldstar Software's free **KillUser** tool. This tool connects to a database engine and terminates all user connections, and it can be run from a simple batch file – useful to execute immediately before your backup process. You can find this tool here:

http://www.goldstarsoftware.com/tools.asp

If you are running a 24x7 operation and killing off the user connections before the backup is simply not possible in your environment, then you will have a problem doing a standard backup. Because the database files are being constantly written, any "standard" backup will result in a jumble of files with different timestamps, and if a file takes longer than 10 seconds to back up, it may even result in a backup that contains corrupted files! This simply will not do.

Luckily, there is another option to get backups while your system is "live". Doing this requires a special database mode called *Continuous Operations Mode*. Continuous Operations Mode is a special state for database files that "freezes" the files as of a given point in time, making it possible to get a snapshot

backup of all files at the same time. While the system is in this mode, database writes are still completing, but they go to different "delta" files (files in the same folder, but with a ^^^ extension) to prevent the writes from corrupting the backup. When you are done with the backup, another command takes the database out of Continuous Operations Mode, the data from the delta files is written back to the main files, and the deltas are deleted.

Setting up Continuous Operations Mode is a bit more difficult than our usual Tech Tip, so please see your PSQL documentation for formal information on how this works and how to implement it in your environment. You can also check out Goldstar Software's white paper on the topic here:

http://www.goldstarsoftware.com/whitepapers-troubleshooting.asp

See the second paper (on using Continuous Operations Mode) for info on setting this up on your system.

Finally, don't forget that you not only need to have your critical data backed up, but it is also good practice to have your entire server and workstation hard disks backed up as well. This can help minimize down-time after a hard disk crash or other problem that trashes your entire computer. Goldstar Software strongly recommends the user of backup software that can perform both file-level and image level backups, and we recommend backing up that data to portable (USB) hard disk drives for the best price, performance, and convenience.

Many USB hard disks come with software built in that will provide automated backups (such as the **Seagate Backup Plus**), and these are cheap enough that you could easily have several of these so that you can keep multiple backups of each machine. For additional control, consider a product line like **NovaBACKUP**, which can automate both workstation and server backups for you. Get more information from this link:

http://www.goldstarsoftware.com/novabackup.asp

If this is all a bit too complicated, Goldstar Software also provides a range of **Data Protection Services** to help you select the BEST way to back up your data. Get more information from this link:

http://www.goldstarsoftware.com/gsdps.asp

We're here and ready to help you!