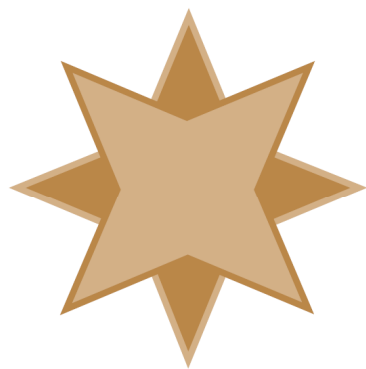


Using Backup Agent To Obtain Proper Backups

A White Paper From



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Using Backup Agent to Obtain Proper Backups

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In one of our oldest white papers, *Using Continuous Operations Mode for Proper Backups*, we discussed many of the issues common with getting a valid backup, including the type of consistency you can achieve, and describing how Continuous Operations Mode works in detail. (If you've not seen this paper, you may wish to review the technical details there first.)

This paper assumes that you already are aware of ContOps and its benefits, and it specifically covers the installation and operation of the Backup Agent as it relates to ensuring that you are properly protecting your Actian PSQL/Zen data.

What Is Backup Agent?

Backup Agent is a separate utility that can be installed to your Actian PSQL/Zen database engine to automate the use of continuous operations mode, which is required to ensure that your system can be properly backed up while users are using it. (Again, if you've not reviewed our paper on Continuous Operations Mode, please start there first.) Backup Agent was first released along with Pervasive.SQL V8, but Actian has released a version of Backup Agent for each version of Actian PSQL or Zen ever since.

Purchasing Backup Agent

When originally released, Backup Agent was a separately-purchased tool. However, starting with Pervasive PSQL v11, the Backup Agent license is embedded inside the Server and Vx Server and no additional purchase is required. With Actian Zen, the license is similarly included in the Enterprise Server and Cloud Server software.

If you have a Workgroup Engine, then you will need to purchase a separate license in order to use the Backup Agent with your database engine.

Installing Backup Agent on Windows

Installing Backup Agent takes only a minute or two at most.

IMPORTANT NOTE: Installing Backup Agent requires that the engine restart when installing the hook module. This will disconnect any database users from the system, so you need to do this when nobody is using the system.

If you are running a Workgroup Engine, then download the Backup Agent installer image by going to Actian's web site at https://esd.actian.com/product/Zen_PSQL and selecting the Audit/Backup/DataExchange option in the center box.

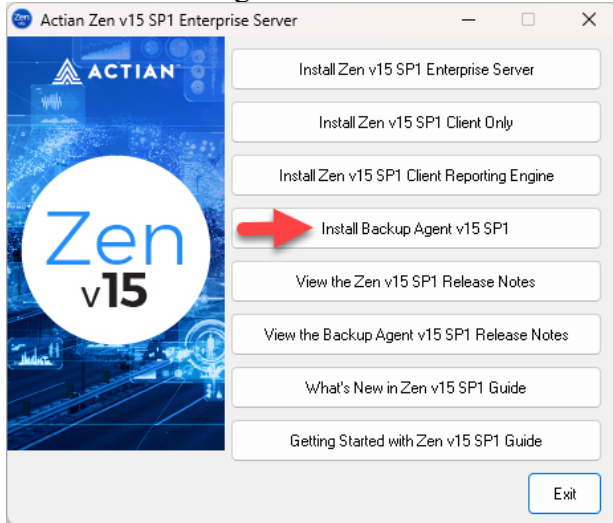
If you are running a server-class database engine (Actian Zen Enterprise Server, Actian Zen Cloud Server, Actian PSQL Server, or Actian PSQL Vx Server) then you already

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have the installer image inside the original engine install. Just re-run the installer and look for this dialog box:



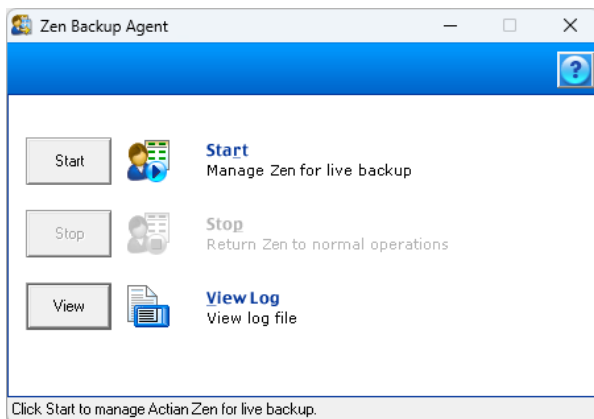
Click on the **Install Backup Agent** button and just follow the simple “Next” prompts. When the install is complete, the engine will be restarted, and users can get back into the database once again.

If you are using a Workgroup Engine, you will have only a 30-day trial of the Backup Agent installed, so be sure to purchase your license and apply it with the *License Administrator* before that trial expires if you expect to use it for all future backups.

[If you are running a Linux engine, see the docs with that download for install details.]

Running Backup Agent from the GUI

Once installed, you can launch the graphical user interface by searching the Start Menu for *Zen Backup Agent* and opening it up:



If you want to start the Backup Agent to protect any open files, click the **Start** button and wait for the **Stop** button to activate. When you are done backing up your files, click **Stop**

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and wait for the **Start** button to activate again. (This may take some time, depending on the duration and the number of changes made during the backup.)

The complete manual for Backup Agent is hiding behind the “?” button in the upper right corner, in case you want to look at Actian’s own documentation, too.

Running Backup Agent from a Command Line

You can also run the Backup Agent directly from any command prompt window, which is useful if you are going to copy the files from a command prompt anyway. From the command prompt, enter the command:

```
PVBACKUP -ON
```

And the Backup Agent will start protecting your files. Once your backup or file copy is completed, issue the command:

```
PVBACKUP -OFF
```

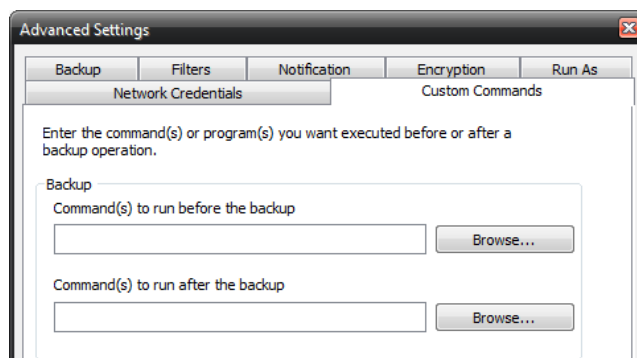
This shuts down the Backup Agent. If you forget whether you have the Backup Agent on or off, you can use this command:

```
PVBACKUP -STATUS
```

Or you can load the GUI and check to see which button is available. Note that the command line and GUI can be used interchangeably, too.

Running Backup Agent from Backup Software

If you are working with dedicated backup software, you should look inside the configuration dialogs for the backup job itself for a place to enter the proper commands. Usually, these are named something like “Pre-Job Commands” and “Post-Job Commands”, or something similar. If you cannot find it, contact the software developer, but here is an example screen from NovaBackup:



In these boxes, simply add the PVBACKUP -ON and -OFF commands as described above, and the software will take care of that for you. Depending on the backup software you are using, you may not need to enter the full pathname. Refer to the user documentation or online help that accompanies your backup software for specific requirements. If you have an option to ALSO fire the POST job even if the backup fails, then make sure you have enabled that option, too.

If push comes to shove, you can always use a separate Scheduled Task to enable and disable the Backup Agent, but that is more complicated as it relies on accurate backup times to know when to stop the Backup Agent.

Checking Backup Agent Operations

While running, the Backup Agent maintains its own dedicated log file for backup events. From the GUI window, click the View button, select the most recent log file, and click the View Log button at the bottom of that dialog box.

You may see two lines in the log like this:

```
I 49788 1/30/2023 2:46:08 PM Backup Agent is now ON.  
I 60812 1/30/2023 2:46:11 PM Backup Agent is now OFF.
```

This indicates that the Backup Agent was started and stopped, but that no database files were open at the time.

If there ARE open files when the Backup Agent is started, then you will see a message like the following:

```
I 50736 1/30/2023 2:48:00 PM Backup Agent is now ON for these files:  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\RELATE.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\INDEX.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\ATTRIB.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\FIELD.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\VIEW.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\PERSON.MKD",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\FILE.DDF",  
"C:\PROGRAMDATA\ACTIAN\ZEN\DBNAMES.CFG"
```

If files are opened AFTER the Backup Agent starts, then you will see additional lines for each new file opened, like this:

```
I 46104 1/30/2023 2:49:57 PM Backup Agent is now ON for this file:  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\BILLING.MKD"  
I 46104 1/30/2023 2:49:57 PM Backup Agent is now ON for this file:  
"C:\PROGRAMDATA\ACTIAN\ZEN\DEMODATA\CLASS.MKD"
```

It is likely that you may see some errors, too, especially with respect to temporary files maintained by the engine or its utilities:

```
I 32412 1/30/2023 2:49:53 PM Backup Agent is unable to complete the ON request for the file:  
"C:\WINDOWS\TEMP\1176838656_1.MKD" (Status 85)
```

This is simply an informational message (as evidenced by the I in the first column) and can be safely ignored. If you see errors you're your own tables, though, then it could mean that something else is interfering with the Backup Agent, and additional investigation may be warranted.

Of course, when you are done with the backup and stop the Backup Agent, you will get another message stating that the Backup Agent is now OFF for these files, and you know that you are back in normal mode again.

Important Notes About Using Backup Agent

There are several important issues to avoid when using the Backup Agent:

- **Don't Mix with Defragmenter, Rebuild or Archival Logging:** If you are defragmenting or rebuilding files, you should do your backup BEFORE you use these

tools. It is not possible to back up a file that it is in the middle of defragmentation or rebuilding (and vice versa). It is not possible to use Continuous Operations Mode in conjunction with the Archival Logging feature of the database engine.

- **Choose Backup Time to Minimize System Impact:** Continuous operations mode imparts some considerable overhead on the database engine. To that end, you should run your backups when the fewest number of people are writing to the database. This will reduce the amount of free disk space needed for change tracking, as well as avoid a major performance impact.
- **Don't Forget to Stop the Agent:** If you accidentally forget to stop the Backup Agent, then files will be left in ContOps mode for an extended time, and this can lead to system performance issues, as well as possible instability. With automated backup systems, it is most important to ensure that the PVBACKUP -OFF command will fire at the end of every job, even if the job failed. (Some applications control this separately.) If you forget for some reason, then you may have inordinately large delta files, which can take a LONG time to roll out. (See the paper on Continuous Operations Mode for additional information about this.)
- **Check Operations After a Crash:** If your server crashes while the Backup Agent is active, the Agent should roll all files out of ContOps mode properly for you. However, this is a good time to check the logs and ensure that each file is properly rolled out and that there are no errors being reported.
- **Application Status 46 or 85 Returned During a Backup:** The Backup Agent ONLY puts open files into backup mode. If a file is NOT currently open at the time of the backup, then your backup solution may start copying that file without any special precautions. In some cases, this can prevent the database engine from accessing the file entirely, returning a Status 85. In other cases, the file may be allowed to open in a ReadOnly mode, which will work fine until the application attempts to write to the file, when a Status 46 is returned. To avoid this issue, you should "white list" your critical database files by creating a file called IFL.TXT in the folder <Zen Application Data directory>\PBA\Data and adding the path and file names that you wish to always include in the backup. (Wildcards are supported here, so take advantage of that if you can.)
- **Avoid Write-Heavy Temporary Files:** As with the Include File List (IFL.TXT) mentioned above, the Backup Agent also supports an Exclude File List (EFL.TXT) that can be used to exclude files from backup mode. This can be useful to skip temporary data files (or even entire folders) which are not needed for the backup, or which take so many changes that ContOps is unstable when used with it. To exclude files, create a file in the folder <Zen Application Data directory>\PBA\Data called EFL.TXT and add the path and file names that you wish to always exclude from the backup. (Again, use wildcards to save time.)
- **Watch Your Disk Space:** As noted in the discussion on Continuous Operations Mode, you need sufficient disk space to save all of the changes (deltas) that take place while in this protected mode. Make sure that you ALWAYS maintain sufficient free space for the changes taking place on your system, or you may see crashes or corruption.

About the Author: Bill Bach is the founder and President of Goldstar Software Inc., a firm dedicated to providing installation, configuration, optimization, and troubleshooting services for database engines from Actian (formerly Pervasive Software) of Btrieve, Pervasive.SQL, Pervasive PSQL, Actian PSQL, and Actian Zen. For more information about our firm, please visit us at <http://www.goldstarsoftware.com>.