

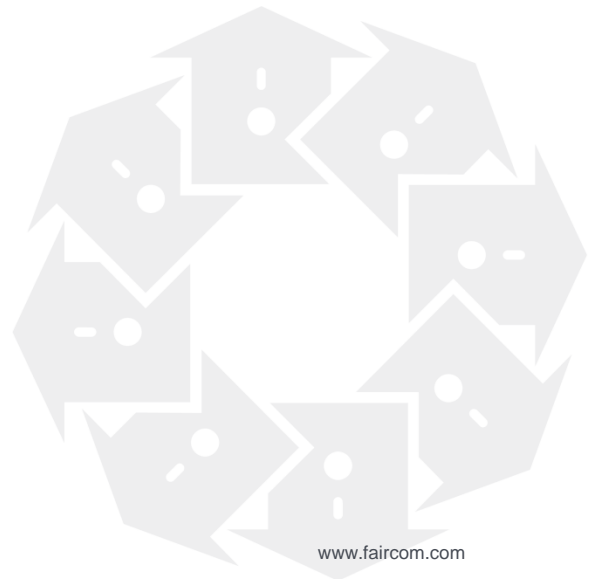


FairCom White Paper
VSS Integration



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1. c-treeACE Volume Shadow Service (VSS) Support

The Volume Shadow Service (VSS) is a Microsoft technology built into Microsoft Windows operating systems starting from Microsoft Windows XP. This service allows taking manual or automatic backup copies or “snapshots” of a logical drive. Snapshots have two primary purposes:

- They allow the creation of consistent backups of a volume, ensuring that the contents cannot change while the backup is being made.
- They avoid problems with file locking.

By creating a read-only copy of the volume, backup programs are able to access every file without interfering with other programs writing to those same files.

c-treeACE Server provides VSS support through its VSS writer, which controls how c-treeACE data is set to a consistent state at the beginning of a VSS operation and maintain that consistency throughout the process.

The VSS writer is an integral component of the VSS support provided by c-treeACE. This component is supplied as a Windows dynamic link library (*c-treeACEVSSWriter.dll*) and can be optionally loaded by c-treeACE at startup.

This paper discusses the following topics:

- **VSS Configuration** (page 1) - Explains the configuration option that needs to be enabled when you are using VSS.
- **VSS Diagnostic Logging** (page 3) - Explains the configuration option enables diagnostic logging using VSS.
- **Dynamic API Interaction** (page 4) - Explains an API function can be used to change VSS configuration dynamically.

1.1 VSS Configuration

```
VSS_WRITER YES
```

With this option enabled, c-treeACE loads the Volume Shadow Copy Service (VSS) writer DLL (*c-treeACEVSSWriter.dll*) and initializes the VSS writer when the server starts.

Note: VSS backups require the Volume Shadow Copy service to be running. If this Windows service is set to start manually or is off by default, it needs to be started before VSS backup will work.

The following message is logged in *CTSTATUS.FCS* indicating the VSS writer has been started:

```
Mon Sep 13 14:11:27 2010
- User# 00001      VSS Init: Successfully started the VSS writer.
```



If you run the command “vssadmin list writers” on a machine with c-treeACE Server running and a properly configured VSS, the list should include `c-treeACEVSSWriter`.

Compatibility Notes

- The FairCom VSS writer is compatible with the backup utilities provided in the *server* versions of Windows.
- The Windows backup software provided in *desktop* versions of Windows (the Enterprise edition of Windows 7 and Windows 8) is not a VSS-compatible backup provider and therefore will *not* work with the FairCom VSS writer.
- Windows Server backup (2008 & 2012) is a VSS provider and works with the FairCom VSS writer.
- Acronis Backup has been tested on Windows 7 (both 32-bit and 64-bit) and works correctly with the FairCom VSS writer when configured with `ctsrvr.dds`.
- The Novastor backup utility has been tested on non-server versions of Windows and works correctly with the FairCom VSS writer when configured with `ctsrvr.dds`.
- Other third-party backup utilities may work with the FairCom VSS writer if they are VSS-compatible backup providers. Please check with the manufacturer of your backup utility for information about VSS compatibility.

User Permissions

FairCom VSS Writer is intended to be run by users with Administrator permissions. To avoid permission issues when running the VSS Writer with a user that is not an Administrator, you must perform the following operations on the Windows registry:

1. Run the Windows **regedit** command.
2. Browse to find the Key:
`HKEY_LOCAL_MACHINE>SYSTEM>CurrentControlSet>Services>VSS>VssAccessControl`
3. Insert a new REG_DWORD value with the following syntax DOMAINNAME\USERNAME. For example, if your domain is MYDomain and your user name is User, enter: `MYDomain\User`
4. Set the newly created key to the hexadecimal value of 1.
5. Restart the computer to apply the changes.

Files to Be Backed Up

The VSS writer needs a list of files that are considered as under the server's control. This information must be located in the file `ctsrvr.dds` residing in the server's working directory (where the `ctreesql.exe` is located). For the VSS backup, only entries between `!FILES` and `!END` are relevant. There is no directory recursion, so wildcards will not be matched in subdirectories.

```
!FILES
C:\FairCom\ctreeSDK\ctreeAPI\bin.sql\ctreeSQL.dbs\test1.dat
C:\FairCom\ctreeSDK\ctreeAPI\bin.sql\ctreeSQL.dbs\test1.idx
ctreeSQL.dbs\*.dat
ctreeSQL.dbs\*.idx
ctreeSQL.dbs\SQL_SYS\*
!END
```

This information tells the backup utility which files are under c-treeACE control. If the set of files being backed up does not intersect with the set of files listed in `ctsrvr.dds`, the VSS service does



not interact with c-treeACE VSS writer, resulting in an invalid backup of any files open by the server.

While testing, it is recommended to run the c-treeACE SQL Server with `DIAGNOSTICS VSS_WRITER` in `ctsvr.cfg`. When the VSS writer is correctly configured, you should see entries logged to `CTSTATUS.FCS` like those listed in *VSS Diagnostic Logging* (page 3).

1.2 VSS Diagnostic Logging

The following c-treeACE configuration option enables VSS writer diagnostic logging:

```
DIAGNOSTICS VSS_WRITER
```

When enabled, the VSS writer logs diagnostic messages to `CTSTATUS.FCS`. These messages indicate the sequence of operations to which the VSS writer is responding. Some examples are shown below:

```
Tue Sep 14 15:44:05 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnIdentify called
Tue Sep 14 15:44:07 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnPrepareBackup called
Tue Sep 14 15:44:07 2010
- User# 00016    VSS Diag: [0x1098] (+) Component: CtreeACE
Tue Sep 14 15:44:07 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnPrepareSnapshot called
Tue Sep 14 15:44:07 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnFreeze called
Tue Sep 14 15:44:07 2010
- User# 00016    VSS Diag: [0x1098]    QuietCtree(ctQTblockALL | ctQTflushAllFiles)...
Tue Sep 14 15:44:08 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnThaw called
Tue Sep 14 15:44:08 2010
- User# 00016    VSS Diag: [0x1098]    QuietCtree(ctQTunblockALL)...
Tue Sep 14 15:44:08 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnPostSnapshot called
Tue Sep 14 15:44:10 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnIdentify called
Tue Sep 14 15:44:25 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnIdentify called
Tue Sep 14 15:44:26 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnBackupComplete called
Tue Sep 14 15:44:26 2010
- User# 00016    VSS Diag: [0x1098]    c-treeACEVSSWriter::OnBackupShutdown called
```

Note: The VSS writer always logs error messages to the Windows event log, even if the `DIAGNOSTICS VSS_WRITER` option is not specified in the configuration file.



1.3 Dynamic API Interaction

The **SetConfiguration()**, **ctSETCFG()** API function can be used to change VSS configuration dynamically.

Examples

If the c-treeACE VSS writer is not running, the following call starts it:

```
ctSETCFG(setcfgVSS_WRITER, "YES");
```

If the c-treeACE VSS writer is running, the following call stops it:

```
ctSETCFG(setcfgVSS_WRITER, "NO");
```

The following call enables VSS writer diagnostic logging:

```
ctSETCFG(setcfgDIAGNOSTICS, "VSS_WRITER");
```

The following call disables VSS writer diagnostic logging:

```
ctSETCFG(setcfgDIAGNOSTICS, "~VSS_WRITER");
```

The following SQL built-in procedure can enable VSS Writer support:

```
call fc_set_sysconfig('vss_writer', 'YES');
call fc_set_sysconfig('diagnostics', 'VSS_WRITER');
```

2. Document History

8/23/2016	Corrected <i>VSS Configuration</i> (page 1): ctsrvr.dds must reside in the server's working directory. Removed obsolete c-treeACEVSSWriter.exe.
9/17/2014	Updated Compatibility Notes.
9/15/2014	Added Compatibility Notes.
9/15/2014	Updated information in <i>VSS Configuration</i> (page 1) to add information about files listed in <i>ctsrvr.dds</i> .
6/20/2014	Document first published.

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