WHITE PAPER: ENTERPRISE SOLUTIONS

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# Symantec Backup Exec™ 11d *for Windows® Servers* Advanced Open File Option

Advanced Protection for Open Files

White Paper: Symantec Enterprise Solutions

# Symantec Backup Exec™ 11d *for Windows® Servers* Advanced Open File Option

## Advanced Protection for Open Files

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## Executive summary

Today's IT administrators are faced with the daunting task of ensuring business continuity by protecting their company's data. Backup operations are becoming increasingly complex due to mixed environments, as well as the need for increased application availability that requires those applications to be backed up even while in use. Three key challenges facing IT administrators during backup operations are:

- **Incomplete backups.** Open files cause most incomplete backups. One measurement of a quality backup is that all files are backed up completely, enabling a point-in-time recovery. In the event that a file restoration or recovery is needed, the ability to recover all files at a point in time ensures data consistency.
- **Minimal or no backup window.** Today's fast-paced, competitive business environment requires networks to be operational around the clock. Web sites, email systems, and other databases must be available 24x7. This means that it is unacceptable to bring down a system or the entire network to perform backup operations.
- **Maintaining data integrity.** If files are left open and are changing during a backup, corruption of the files is likely to occur without the right open file protection solution. If a disaster occurs, and the only backup available contains corrupt files, the ability of the business to remain operational is severely affected.

Symantec Backup Exec 11d *for Windows Servers* Advanced Open File Option improves application availability while simultaneously protecting open files during backups. The Advanced Open File Option meets these three challenges and ensures quality backups by providing:

- **100 percent complete backups.** By allowing files to be open during a backup, Advanced Open File Option offers complete data backups at a specific point in time. This enables businesses to create a "recovery-consistent backup." Recovery consistency is critical if businesses want to recover all data as it existed at a specific point in time. The Advanced Open File Option also offers the ability to create a snapshot of all volumes selected for backup at one time.
- **100 percent system availability.** With the use of the Advanced Open File Option during a backup, all systems are available, thereby preventing delays in productivity.

**Key benefits**

- Delivers consistent recovery across all volumes with ability to snap all volumes at one time
- Delivers 100 percent data integrity
- Helps ensure 100 percent complete backups

- **100 percent data integrity.** A mechanism that permits data changes during a backup operation, without corrupting that data, is essential for recovery. Advanced Open File Option has the ability to create a point-in-time snapshot of the data, so that any files open during the backup can be recovered without data corruption.

Advanced Open File Option also has the ability to use different snapshot providers—such as Symantec™ Volume Snapshot Provider or Veritas FlashSnap, now from Symantec, or Microsoft® Volume Shadow Copy Service (VSS)—further customizing data protection for each customer's unique environment.

Symantec Backup Exec 11d *for Windows Servers* Advanced Open File Option is a separately licensed and priced option designed to run with Symantec Backup Exec 11d *for Windows Servers*.

## How the Advanced Open File Option works

The Advanced Open File Option can simultaneously create a point-in-time record or snapshot of the data while allowing data to change during a backup.

### Point-in-time record

- Figure 1 shows a Backup Exec backup job, with Advanced Open File Option selected, scheduled to back up Volume C on a Microsoft Windows® based server. When the job is scheduled to begin, Backup Exec software will notify the Advanced Open File Option that a backup is about to start.
- When the Advanced Open File Option receives notification, a snapshot is taken of Volume C. Like a photograph, the snapshot provides an exact point-in-time record of the data. For example, if the backup job started at noon, the data backed up is exactly as it existed on Volume C at noon.
- Once the snapshot is taken, the backup job starts and the data on Volume C is backed up.

### Changing files

- During the backup job, files can be open and data can change. The Advanced Open File Option allows data to change by making a copy of the original data. The snapshot tracks data changes. This is illustrated in Figure 2. For example, an open file, such as a Microsoft Word document, contains the data A, B, and C in blocks 1, 2, and 3.
  - During the backup job, "B" changes to "D" in block 2.
  - The original data in block 2 is copied to a "static volume." In this case, "B" is the original data.
  - The changed file is now the most current file.

- When the backup process comes to a changed block, the snapshot provider replaces these changed blocks with the original data from the static volume. The snapshot then sends the point-in-time data to Backup Exec, which then records that data on the backup media.
- When the backup is complete, the snapshot is released.

**Figure 1**

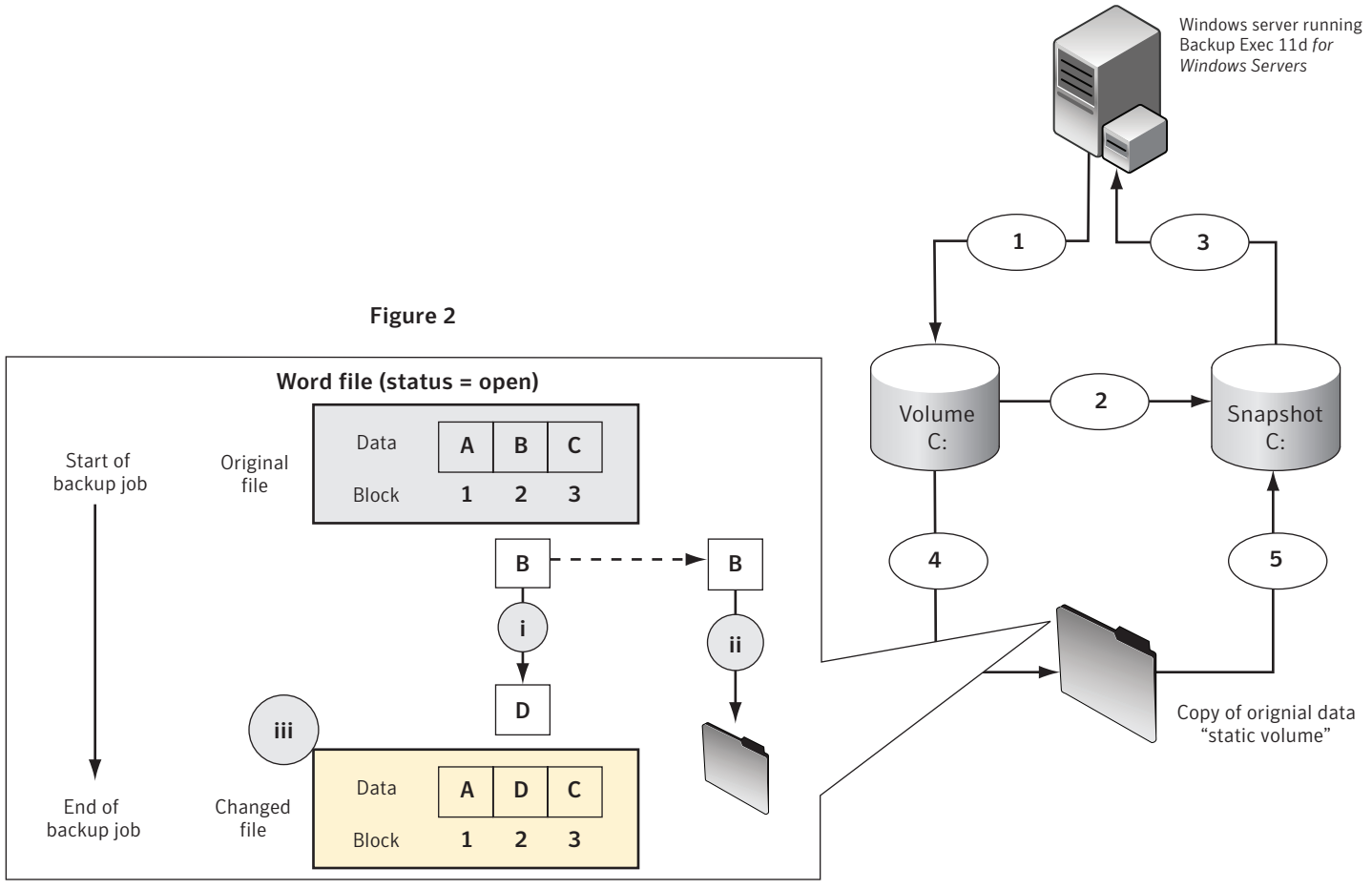


**Figure 2**

### Supported snapshot technology

When creating a snapshot of a volume, the Backup Exec Advanced Open File Option recognizes the following advanced snapshot technologies:

- Backup Exec Advanced Open File Option using the Symantec™ Volume Snapshot Provider
- Veritas Storage Foundation™ *for Windows* FlashSnap Option (now from Symantec)
- Microsoft Volume Shadow Copy Service

Third-party software application vendors often provide additional technologies that work in conjunction with Microsoft VSS. These technologies, called VSS Writers, are used to close any open files residing in the computer's memory before Microsoft VSS makes a snapshot of the volume to be backed up. Using a writer along with Microsoft VSS ensures a complete backup of your volume (see your software documentation for information about writers that may be provided by the software vendor). After making backup selections and then choosing the Advanced Open File Option, Backup Exec increases performance by recognizing any of the above-mentioned snapshot technologies that are installed on the server, and offers users the choice to select a preferred option (writer) to optimize an open file backup. If you prefer, Backup Exec can automatically make the determination for you.

Use the following table as a guide to selecting the proper snapshot technology.

| If you are running: | It is recommended that you use the option: |
|---|---|
| Backup Exec Advanced Open File Option with Windows Server 2003 | Microsoft Volume Shadow Copy Service. |
| Backup Exec Advanced Open File Option with Windows Server 2000, Windows XP | Symantec Volume Snapshot Provider—This is the Backup Exec default. |
| Symantec Storage Foundation *for Windows* | Veritas Storage Foundation *for Windows* FlashSnap Option—For more information on Veritas Storage Foundation *for Windows* FlashSnap Option, visit http://www.symantec.com. |
| Vendor-specific, third-party software, along with Windows XP or Windows Server 2003 | Microsoft Volume Shadow Copy Service—Microsoft's Volume Shadow Copy Service technology enables third party hardware and software vendors to create snapshot plug-ins for use with Microsoft's technology. |

### Static volume

As previously demonstrated, when a backup job is submitted with the Advanced Open File Option selected, a snapshot view of each volume where data is selected for backup is created all at once. When changes are made to files during a backup, the original data is copied to a temporary space called the static volume. The original copy of the data is then backed up, not the changed data. This method is commonly referred to as "copy on write."

If the files selected for backup reside on more than one volume, Backup Exec creates a static volume for each volume containing data to be backed up. For example, if the data to be backed up resides on a single volume, a single static volume is created. If the data resides on four volumes, four static volumes are created. After the selected files have been backed up, the static volumes are deleted.

The Backup Exec Advanced Open File Option automatically calculates the size of the static volumes needed for the backup, as well as the location of the static volumes. The Advanced Open File Option wizard can also be used to enter specific values for the size and location of the static volume. However, if the amount of data selected to be backed up is significantly less than the total amount of data on the volume, the backup may run faster if the Advanced Open File Option wizard is used to decrease the size of the static volumes (rather than letting Backup Exec software automatically calculate the size of the static volumes).

**Note:** You can modify these percentages from the Advanced Open File Option wizard. However, use caution when manually entering specific sizes for the static volumes. Please refer to the Administrator's Guide for more information.

### Advantages to using Advanced Open File Option

Backup Exec 11d *for Windows Servers* by default gives users other methods for open file backup if the Advanced Open File Option is not selected. Although Backup Exec software provides alternatives for open file backup other than the Advanced Open File Option, it is important to know the limitations and disadvantages of these alternatives, and to recognize that they do not provide either a complete backup of open files or protection of data integrity.

If the Advanced Open File Option is not used, the following alternatives are available:

| Open File Backup Opetional Selections | Description | Disadvantages |
|---|---|---|
| Never | Select this option to have Backup Exec skip open files if they are encountered during the backup operation. A listing of skipped files appears in the backup job log. | Risk of not having a complete backup. |
| If closed within X seconds | Select this option to have Backup Exec wait the specified time interval for a file to close and then back it up. If the file does not close during the specified interval, it is skipped. A listing of skipped files appears in the job log for the backup. | If multiple files are open, Backup Exec waits the specified time interval for each file. Depending on the number of open files, this wait may significantly increase the backup time. |
| With a lock | Select this option to have Backup Exec attempt to lock files that are in use. If Backup Exec is able to lock a file, other processes are prevented from writing to it. | Backing up open files is not as effective as closing applications and allowing the files to be backed up in a consistent state. |
| Without a lock | Select this option to have Backup Exec back up files without a lock during backup. This allows other applications to write data to the file during the backup operation. | This option allows files to be backed up that contain inconsistent and possibly corrupt data. |

### Proper protection of databases

The recommended method for protecting databases such as Microsoft Exchange, SQL, Oracle®, and others, is with high-performance Backup Exec agents. Backup Exec agents provide online backup of data, greater granularity in the data backed up, selective restores of data, and more integration with the database application while preventing backups of partial transactions.

The Advanced Open File Option can be used on the same volume as a database to provide open file support for other applications. The Advanced Open File Option provides generic protection for data that is not supported by the Backup Exec agents.

## Using the Advanced Open File Option

You can use the Advanced Open File Option for specific backup jobs, or you can set the Advanced Open File Option as the default to be used for every backup job. If the volume selected for backup does not meet the recommended requirements for using the Advanced Open File Option, then other options for backing up open files can be selected to perform the backup. For example, if the option to back up open files with a lock is selected on the Advanced Backup dialog box, that option applies to a backup job if the Advanced Open File Option cannot run on the volume.

### Advanced Open File Option requirements

The following requirements must be in place in order to use the Advanced Open File Option on the media server; for remote Windows 2000, Windows XP, and Windows Server 2003 based servers; on workstations; and for volumes on those systems. The Advanced Open File Option must be purchased for each server or workstation to be protected.

The media server must have:

- Backup Exec 11d *for Windows Servers* installed
- Intel® Pentium® class processor
- If the Advanced Open File Option is to be used locally, then the media server must have Advanced Open File Option installed
- No other open file backup solution can be loaded or running while the Backup Exec Advanced Open File Option driver is loaded.

The remote computer you want to back up with the Advanced Open File Option must have:

- Windows 2000, Windows XP, or Windows Server 2003
- Intel Pentium class processor
- Advanced Open File Option installed
- Backup Exec Remote Agent *for Windows Servers* installed
- An unmapped drive letter available for the Advanced Open File Option to map to the static volume

**Note:** The Advanced Open File Option cannot be used on CD-ROM or floppy diskettes.

## Summary

Complete, point-in-time backups are a challenge with standard backup applications. Without the ability to back up files that are open or in use, IT administrators are confronted with incomplete backups, unacceptable downtime to perform backups, and the inability to preserve data integrity. These challenges put businesses at risk in the event a recovery is needed. The Backup Exec Advanced Open File Option eases these challenges by providing complete backups without interruption while maintaining data integrity and providing the ability to perform point-in-time recovery of critical data.

**About Symantec**

Symantec is the world leader in providing solutions to help individuals and enterprises assure the security, availability, and integrity of their information. Headquartered in Cupertino, Calif., Symantec has operations in more than 40 countries. More information is available at www.symantec.com.

For specific country offices and contact numbers, please visit our Web site. For product information in the U.S., call toll-free 1 (800) 745 6054.

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