VERITAS™

Optimized Backup Performance

VERITAS Backup Exec™ 9.0 *for Windows Servers*

Intelligent Image Option

VERITAS™

TABLE OF CONTENTS

VERITAS Backup Exec ™ 9.0 for Windows Servers Intelligent Image Option is a separately licensed and priced option designed to run with VERITAS Backup Exec 9.0 for Windows Servers to increase backup performance while backing up data on a local media or remote server.

INTRODUCTION

With increasing storage and demand for networks to be operational 24x7, the backup window is becoming smaller and protecting business-critical data is becoming a greater challenge. Servers containing file systems with a very large number of small files, such as a web server, will greatly benefit from increased performance and reduced backup windows provided by the VERITAS Backup Exec ™ Intelligent Image Option.

SOLUTION

The Intelligent Image Option provides fast backup performance with less CPU processing by separately backing up all of the information about the files themselves (meta data), and then backing up all the data in the files at the block level, as one image. Unlike other raw-image backup products, Backup Exec's built-in intelligence avoids the inclusion of unused and temporary-usage space within the image file, reducing the volume size and backup time needed to complete the task. When the data needs to be restored, the administrator has the ability to restore an individual file, directory or the entire image.

Additionally, the Intelligent Image Option includes Backup Exec's Advanced Open File Option. The Advanced Open File Option enables network administrators to back up open files on Windows systems even while they are in use. This feature eliminates the need for downtime allowing systems to be backed up quickly and without impact to productivity.

Intelligent Image Option seamlessly integrates into Backup Exec and can be used with incremental or differential backups between full backup jobs — further reducing the amount of data to backup and therefore increasing backup speeds.

WHICH CUSTOMERS BENEFIT THE MOST?

Most backup servers will benefit from the speed offered by the Intelligent Image Option. However, an ideal server candidate would be one with thousands or even millions of files, which are in use 24x7, or has little or no bandwidth to spare and requires quick backups. Intelligent Image Option was designed to increase backup performance for servers active with live file systems containing a very large number of smaller or compressed files. A web server requiring the quick backup of a large number of files is a great example. While the Intelligent Image Option offers a high performance backup method, performance gains may not be apparent without a high performance backup device, whether tape or hard disk. On systems where the file system is much faster than the backup device, the backup device limits performance.

Intelligent Image Option addresses the performance needs of systems with many open files therefore, a server running the Backup Exec Advanced Open File Option prior to using Intelligent Image Option will see the greatest performance benefit from the Intelligent Image Option. A server that contains a relatively small number of larger files may not see a performance increase over traditional file-by-file backup. However, the Intelligent Image Option has the ability to perform consistent point-in-time backups of live file systems, which may provide additional benefit for the user.

INTELLIGENT IMAGE OPTION FEATURES

The following features distinguish the Backup Exec Intelligent Image Option from other image backup solutions available in the market:

- **Full, incremental and differential backup methods** – Just as in traditional backups, these methods are available using Intelligent Image Option to continue routine backup strategies developed for traditional backups.

- **Backup and restore of open files** – Included open file technology allows users continuous access to applications during backup and restore operations. This open file technology is installed at the same time as the Intelligent Image Option. If the Backup Exec Open File Option is installed already, it is upgraded automatically, if necessary.

- **All Backup Exec devices and servers** –The Intelligent Image Option allows access to all devices including Backup Folders (in the Backup-to-disk feature). Additionally, it can be deployed on Backup Exec media servers and remote servers.

- **Backup and restore of compressed files** – The Intelligent Image Option increases backup performance by not expanding compressed files during backup, unlike traditional backups that expand compressed files before copying them to the backup media.

- **Backup of encrypted files using non-image methods** – Encrypted files are backed up using a non-image method in the same job in which the image method is used for other files.

- **Single pass restores for individual file, multiple files and entire volume selections** – For restores, selections can be made down to the file level. All selected files are restored to the destination disk in original volume order in a single pass. Restore granularity provides faster restore performance.

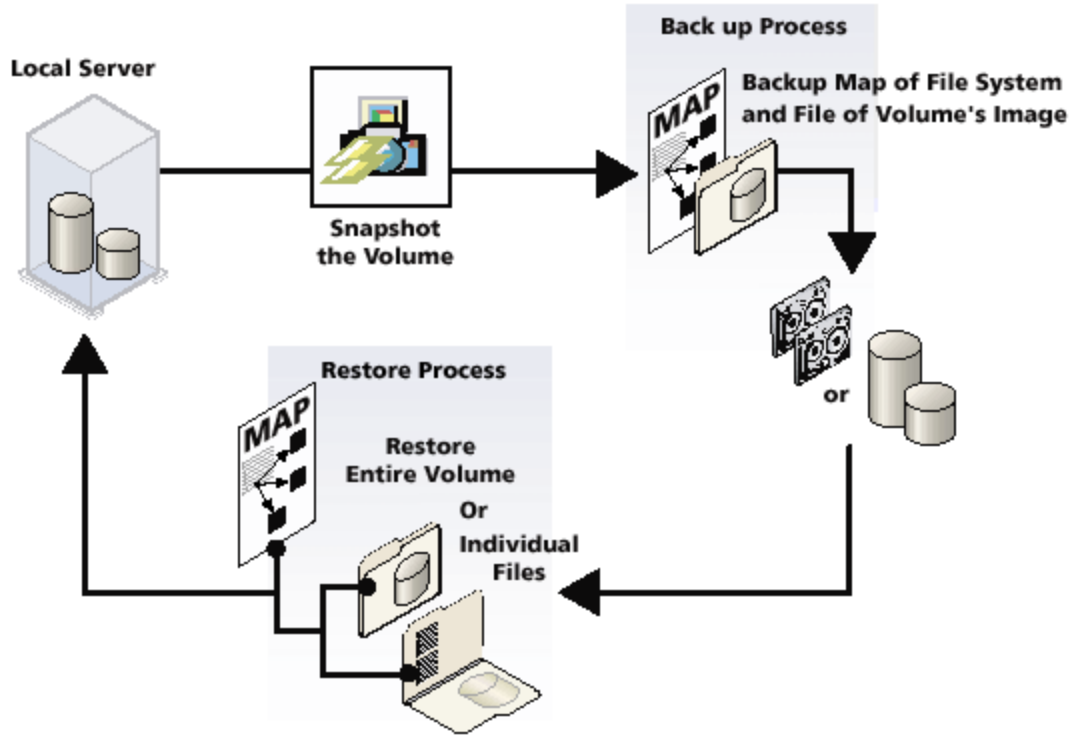
- **Restores of compressed and non-compressed files** – If the volume the files are being restored to does not support compression, the files will be restored in their expanded form.

- **Restores using the VERITAS Backup Exec Intelligent Disaster Recovery ™** – Intelligent Image Option is available when using Intelligent Disaster Recovery to create a bootable tape image, bootable CD or a set of recovery diskettes that contain all the files required to recover the Windows NT, Windows 2000 and Windows Server 2003 media servers.

- **Product integration** – The Intelligent Image Option can run from the Backup Exec administration console or from the Backup Exec Command Line Applet.

HOW INTELLIGENT IMAGE OPTION WORKS

The Backup Exec Intelligent Image Option creates a single “snapshot” of a volume and sends that file to a storage medium such as a tape or hard drive. It first creates a map of the file system and then creates a single file of the volume’s image. By creating a single volume image, void of empty spaces and temporary data, the Intelligent Image Option eliminates the overhead of a file-by-file backup, reducing job size and CPU processing resulting in faster backup times and reducing host-server CPU cycles.



How Intelligent Image Option Works

BACKUP

Other raw-image solutions allow only a “full” backup of the selected volume, not offering differential or incremental backup. Most operational rotation schemes include these types of backup methods, which are used to reduce the amount of data backed up between full backups of the volume. Intelligent Image Option enables users to incorporate all backup methods in their backup schemes, further reducing the time to complete the backup job between regularly scheduled full backups.

When a job is submitted for backup with Intelligent Image Option selected, Backup Exec Intelligent Image Option open file technology creates a point-in-time image, or snapshot, of the volume to be backed up. Intelligent Image Option then locates the objects selected for backup protection and creates a comprehensive “map” of the file system. Next, Intelligent Image Option writes the data directly to the backup media as a single image, at very high speed.

While map creation imposes some overhead, Intelligent Image Option backup of data as a single image results in much faster backup when compared to traditional backup, when a server contains tens of thousands or more smaller files. The greater the number of files, the greater the backup performance improvement provided by Intelligent Image Option.

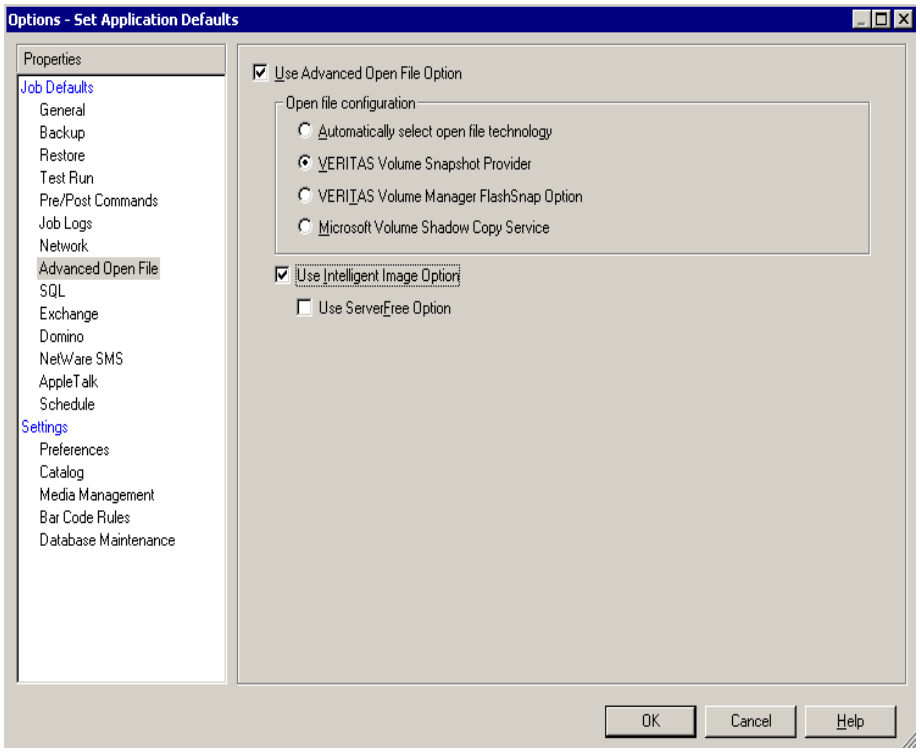
Additionally, compared to the traditional backup method of writing the data from the selected files to the backup media one at a time, Intelligent Image Option writes all the data in the selected files to the backup media as one image, utilizing fewer host server CPU cycles. This frees valuable server resources for other user applications.

Finally, unlike some raw image backup solutions, Intelligent Image Option decreases the overall volume of the backup by not backing up unused or temporary space. This decrease in the overall volume of the backup contributes to the speed of the backup and reduces backup media consumption.

During the entire backup process, Backup Exec Intelligent Image Option open file technology works to protect all open files. In a traditional Backup Exec file-by-file backup, without Advanced Open File Option, open files might be backed up while other applications were writing to them. This could cause data to become corrupt and unrestorable, or the open files might be skipped and not backed up at all. Use of Backup Exec Advanced Open File Option allows safe and reliable "point-in-time" backup of active file systems with many open files. Intelligent Image Option uses the same open file technology found in Advanced Open File Option.

Running an Intelligent Image Backup Job

From the administration console an administrator can easily initiate an Intelligent Image Backup on the same screen from which other options can be selected to tailor the backup. Intelligent Image Option can be selected as the backup method for specific jobs or it can be set as the default for all backup jobs. Files backed up using Intelligent Image Option display an “I” after the file name in the catalog.



A view of the Backup Exec Advanced Backup tab illustrates the ease of navigation that users have with Intelligent Image Option.

To set the Intelligent Image Option for a single backup job:

1. On the navigation bar, click Backup.
2. In the Backup Selections pane, select data to be backed up.
3. On the Properties pane, under Settings, click Advanced Open File.
4. Select Use Intelligent Image Option.

To set the image option as the default for all backup jobs:

1. From the menu bar, click Tools and then click Options.
2. On the Job Defaults pane, select Advanced Open File.
3. Select the option Use Intelligent Image Option.
4. Click OK.

All backup jobs now default to using the Intelligent Image Option if it is available.

If the volume selected for backup does not meet the requirements for using the image option, then a non-image backup is performed on the selected files instead. The job log will report that the Intelligent Image Option was not available and that a non-image backup was performed for the selected files.

RESTORE

Unlike some raw image backup solutions that require a whole volume to be restored to recover a few files, Intelligent Image Option provides fast single file, and one pass file-by-file restore. The user selects files for restore from the backup sets, just as with a traditional restore job. Intelligent Image Option then uses the file system map to locate the required data on the backup media. The file data is read from the backup media and restored to the destination disk.

Running an Intelligent Image Restore Job

While data recovery options include restoring the entire volume or an individual file, Intelligent Image Option goes further. It allows a single-pass restore of multiple files within a single backup file or from multiple backup files. Also, Intelligent Image Option can fully protect and restore compressed files, such as zip files, where many image backups cannot.

Intelligent Image backup sets are restored with the same procedure used for any other Backup Exec backup sets. Individual files or whole volumes can be restored. Backup sets created using Intelligent Image Option are displayed in the Restore Selections tab with an icon showing a lightning bolt imposed on an aqua camera.

IIO icon

SPLIT MIRROR BACKUP USING INTELLIGENT IMAGE OPTION

A split mirror of a volume is obtained when an application creates an exact duplicate or copy of a volume at a specific point in time. Intelligent Image Option can use this static split mirror of the volume in the backup process while the original volume is online, active and dynamically evolving. Because the static split mirror is available for backup and open files are not an issue, the Intelligent Image Option open file technology is not needed. This means that the time normally required for temporary cache partition creation and other related preprocessing is regained, resulting in a faster total backup time. Split mirrors are created using VERITAS Volume Manager ™ or Compaq Enterprise Volume Manager.

SUPPORTED VERITAS BACKUP EXEC OPTIONS

Intelligent Image Option can be used with the following VERITAS Backup Exec for Windows Server options and features:

- Intelligent Disaster Recovery
- SAN Shared Storage Option
- Cluster-aware Backup Exec
- Command Line Applet

Intelligent Image Option cannot be used in conjunction with Backup Exec database agents, Unix, Macintosh or NetWare.

USING INTELLIGENT IMAGE OPTION WITH INTELLIGENT DISASTER RECOVERY

VERITAS Backup Exec for Windows Servers Intelligent Disaster Recovery Option ™ is a fully automated disaster recovery solution that can expedite recovery of Windows NT, Windows 2000 and Windows Server 2003 backed up with Intelligent Image Option. To use Intelligent Image Option for disaster recovery, all bootable media must be created using Backup Exec for Windows NT and Windows 2000 v8.6 or later.

USING INTELLIGENT IMAGE OPTION WITH SAN SHARED STORAGE OPTION

Many customers realize the benefits of LAN-free backup for Windows networks — centralized tape libraries, greater control of backup server operations, improved network performance and faster backup speeds. VERITAS Backup Exec™ Shared Storage Option for storage area networks (SAN) allows high-performance LAN-free backup and storage device sharing in a fibre channel SAN. Intelligent Image Option can be installed on a Backup Exec server attached directly to the fibre channel SAN to protect data that also is attached directly to the fibre channel SAN. The combination of the Backup Exec SAN Shared Storage Option and the Intelligent Image Option creates an extremely fast, reliable, scalable backup solution for busy, data-intensive environments.

USING INTELLIGENT IMAGE OPTION WITH CLUSTER-AWARE BACKUP EXEC

Server clusters provide high availability of applications and data to users. Cluster-aware Backup Exec protects data on the cluster's shared disks, as well as data on the cluster nodes' local disks. The Intelligent Image Option can be installed on the controlling node and each failover node to provide image backups for local data. Further, Image backups can be run for shares in a virtual server when the active Backup Exec node owns the shares. Several configurations are available, including fibre channel and storage area network (SAN).

USING INTELLIGENT IMAGE OPTION WITH COMMAND LINE APPLET

The Backup Exec Command Line Applet is a convenient way to access some of the most useful features of Backup Exec from a command prompt. The Command Line Applet allows management of only one server at a time, but allows for remote management of disparate Backup Exec servers within an enterprise.

To use the Command Line Applet, at a command prompt, type: `bemcmd` followed by command line switches that indicate which Backup Exec functions and utilities to perform. For example, to run a backup job using the Intelligent Image Option, an administrator would type:

```
bemcmd -o1 -j"Operations Weekly” -fi:
```

This command will run a previously defined backup job named Operations Weekly as an Intelligent Image backup.

INTELLIGENT IMAGE OPTION REQUIREMENTS

The following are requirements for using Intelligent Image Option:

- VERITAS Backup Exec 9.0 for Windows Servers
- Intelligent Image Option utilizes Backup Exec Open File Option technology. If Advanced Open File Option is not already installed on the media server, then it is automatically installed at the same time as Intelligent Image Option. If Advanced Open File Option is already installed, it is upgraded automatically if necessary, without prompting.

- The volumes selected for back up with Advanced Open File Option must have enough free disk space to start Advanced Open File Option operation (a minimum of 50 MB of available disk space is recommended and an NTFS or FAT file system).
- If Advanced Open File Option is required for use with traditional file-by-file backup (not using Intelligent Image Option), then Open File Option must be purchased separately. The open file technology included with Intelligent Image Option will not work independently of Intelligent Image Option.
- Backup Exec Intelligent Image Option can be installed on a local media server as well as on remote servers.

SUPPORTED FILE SYSTEMS

- 16- and 32- bit FAT
- NTFS 4 and 5

SUMMARY

Intelligent Image Option increases backup performance and eliminates the backup window by the following methods:

- Separately backs up the file meta data and then the raw data as a single image. This decreases the processing burden on the CPU and allows for faster backup performance.

- Intelligent Image Option does not include unused and temporary-usage disk space on the image, therefore reducing the size of the volume and the time to back it up.

- Intelligent Image Option includes Backup Exec's Advanced Open File Option. This option permits a backup job to run and capture files that are changing or are open. Open file technology eliminates the need for allocated non-productive downtime to perform a backup.

- Intelligent Image Option integration with Backup Exec allows the use of modified file backup methods such as incremental or differential backups, further reducing the amount of data backed up in a job.

For customers that have servers with a file system containing thousands or even millions of files, desire point in time recovery, or want to increase productivity by eliminating the backup window, the Intelligent Image Option is perfect solution for refining you data protection strategy.

VERITAS Software Corporation
Corporate Headquarters
350 Ellis Street
Mountain View, CA 94043
650-527-8000 or 866-837-4827

For additional information about VERITAS Software, its products, or the location of an office near you, please call our corporate headquarters or visit our Web site at www.veritas.com.