INTRODUCTION
Microsoft Exchange and SQL servers are mission critical components in today's business environment. IT administrators need to ensure access to data and email communications for employees, customers and partners are maintained 24 hours a day, 7 days a week. The greater reliance on all forms of electronic communication raises the potential of quickly escalating into a business disaster when any event causes mission critical email and database data to become unavailable.

The Symantec Quick Recovery & Off-Host Backup Solutions are the industry's first complete solution for customers who want Quick Recovery and Off-Host Backup support for Microsoft Exchange Server 2003 and Microsoft SQL Server. This solution combines the Symantec Backup Exec Advanced Disk-Based Backup Option with Veritas Storage Foundation for Windows and Veritas FlashSnap to create a solution that eliminates backup windows, reduces the performance load on application servers and quickly brings applications back online after data corruption issues.

This solution leverages the Volume Shadow Copy Service (VSS) capabilities built into Microsoft Exchange Server 2003, Microsoft SQL Server and Microsoft Windows Server 2003. The solution is hardware independent and supports most leading fibre channel and iSCSI SAN arrays.

SOLUTION COMPONENTS
The Symantec Quick Recovery & Off-Host Backup Solution includes the Symantec Backup Exec Advanced Disk-Based Backup Option, Veritas Storage Foundation for Windows and the Veritas FlashSnap Option.

Customer prerequisites include: Microsoft Windows Server 2003, Microsoft Exchange Server 2003 SP1 or Microsoft SQL Server 2000 SP3, a SAN or shared SCSI environment, Symantec Backup Exec Media Server and the appropriate Backup Exec Agents for Exchange or SQL, which include a remote agent for Windows Servers.

SYMANTEC BACKUP EXEC ADVANCED DISK-BASED BACKUP OPTION
Off-Host backups virtually eliminate backup windows and network bandwidth requirements, and do not impact the production server. Additionally, Off-Host backups allow for quick client restore from a single backup image to reduce the number of tapes and eliminate the need to restore from incremental backups. The Off-Host backup feature enables better backup performance and eliminates backup processing overhead on the protected application server by processing the backup operation on a Backup Exec media server instead of on the application server.

VERITAS STORAGE FOUNDATION FOR WINDOWS
Veritas Storage Foundation for Windows dramatically increases the amount of time users have access to data by reducing both planned and unplanned downtime. Traditional disk storage management is a labor intensive process, often requiring systems to be taken offline for hours at a time, disabling users' access to data and requiring tedious, manual intervention by system administrators. Storage Foundation overcomes the obstacles of traditional disk management by providing easy-to-use online disk storage management for mission-critical, enterprise Windows environments. Storage Foundation enables high availability of data and optimized storage I/O performance, and protects current storage investments while also allowing freedom of choice for future storage hardware investments.

VERITAS FLASHSNAP OPTION
Veritas FlashSnap allows you to create independently addressable, point-in-time snapshots that are copies or mirrors of the volumes on your server. These snapshots can be easily moved to another server for backup or other purposes such as testing or data mining. These activities can be performed without affecting the normal functions of mission-critical servers.

The snapshots may also be kept on the same server for quick recovery from data corruption issues. You may choose to recover to the point-in-time of the last snapshot or to the point-of-failure using roll forward recovery. Even when a FlashSnap operation is performed on the same server, its efficient mirror break off and join processes are much faster and takes less CPU cycles than other mirror break off procedures that use ordinary mirroring.
FlashSnap supports Windows Server 2003 Volume Shadow Copy Service (VSS) as a VSS Provider for Microsoft Exchange Server 2003 and Microsoft SQL Server 2000 environments. By leveraging VSS, which is Microsoft's approved and supported technology for taking snapshots, Veritas Storage Foundation for Windows FlashSnap Option can create exact point-in-time copies of data to be used instantly for quick recovery, off-host backup and other processing.

CUSTOMER ADVANTAGES

• Easy to Buy
  o One Part Number Includes All the Software Required

• Leverages Microsoft Volume Shadow Copy Services (VSS) Architecture
  o Microsoft Windows Server 2003
  o Microsoft Exchange Server 2003
  o Microsoft SQL Server 2000

• Heterogeneous Array Support – Works with most leading storage arrays
  o Supports Most Leading Fibre Channel SAN Arrays
  o Supports Most Leading iSCSI SAN Arrays

• Quick Recovery
  o Point-in-Time Snapshots
  o Point-of-Failure or Roll-Forward Recovery
  o Quick Recovery in Minutes versus Hours

• Off-Host Backup
  o Minimal or No Backup Window
  o No Performance Load on Application Server
  o Backup Server can backup at FC Speeds
  o No LAN Performance Impact

VOLUME SHADOW COPY SERVICE

With the release of Windows Server 2003, Microsoft introduced a new storage management technology called Volume Shadow Copy Services (VSS). VSS offers a framework for applications and storage to perform coordinated data snapshots. Because the business application (VSS writer) storage (VSS provider) and backup application (VSS requestor) are tightly coordinated, Microsoft is able to coordinate the snapshot quiesce point while guaranteeing data integrity.

The Shadow Copy technology is the basis of the backup/restore infrastructure in Windows Server 2003. VSS enabled backup applications can utilize VSS to achieve consistent online backups of data and files that are open during the backup. This is accomplished by VSS facilitating communication between the following VSS components:

• VSS Requesters – Backup or Management applications that invoke the Volume Shadow Copy Service to initiate basic VSS functions such as creating, importing, or deleting snapshots. Examples: Backup Exec, NetBackup, FlashSnap.

• VSS Writers – Application-specific software modules that ensure the consistency and integrity of an application’s data when a snapshot is taken. With VSS, the responsibility for data consistency shifts from the requestor application to the production application. The advantage of this is that application developers, who are most knowledgeable about their application, can ensure maximum effectiveness of the snapshot process through development of their own writers. Examples: Exchange Server 2003 Writer, SQL Server 2005 Writer

• VSS Providers – Expose the mechanism for hardware or software-based snapshots. Hardware vendors are responsible for writing providers for their storage arrays. Software vendors, such as Symantec, also write snapshot providers. Windows Server 2003 includes a system software provider with snapshot (shadow copy) functionality, and supports multiple hardware and software providers, which can be used in combination to solve many different
scenarios. On its own, VSS follows a default hierarchy when selecting a provider during the snapshot creation: hardware provider first, followed by software provider, then the system software provider (Copy-on-Write (COW) provider). The requestor can, however, override this hierarchy and specify the provider to use.

**QUICK RECOVERY**

Usually you conduct your backups or incremental backups nightly. In the example below, if your business is running all day and there is a failure at 13:00, you have to go back and recover from media – this can be a very lengthy and tedious process that causes your organization substantial downtime by the time you finally recover. Restoring from backup takes hours at best and only provides the ability to restore to the point in time of the last backup. Transactions that occur after that point are lost.

Symantec provides administrators with the ability to recover in minutes. In this example, you have taken a snapshot. Once created the snapshot remains on the Exchange server where it’s available to enable quick restoration; as stated
earlier - no data transfer from disk or tape is required. The Exchange or SQL databases can be mounted immediately using the snapshot volume.

In the example above, if you have a failure at 13:00, all you need to do is recover from the snapshot to achieve a point-in-time recovery. If you wish to achieve a point-of-failure recovery, replay the transaction logs, and you are back in production. This is an ideal way to painlessly recover from logical errors and increases your business’ ability to be resilient to unplanned downtime, and you are up and running dramatically faster than with the standard data recovery techniques.

**OFF-HOST BACKUP**

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.** According to a survey conducted by Strategic Research Corporation, open files cause 97% of 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 recovery is needed, the ability to recover all files at the 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, e-mail systems, and other databases must be available 24 hours a day, 365 days a year. This means that it is unacceptable to bring down a system or the entire network to perform backup operations.

- **Application Performance and Availability.** Traditional backup processing degrades the performance of other applications running on the server, and frequently requires a dedicated window of time when the system is unavailable to end-users. Off-Host technology allows the backup to run against a copy of the production data on a different server. This removes the performance overhead of backup processing from the production server and eliminates the need for a backup window.

Creating snapshots for Off-Host backup requires minimal overhead and does not interfere with normal system operations. As a result, administrators can schedule snapshots frequently, minimizing potential data loss during a disaster. Off-Host backups are a particularly good solution for organizations with stringent high availability requirements and large amounts of data.
DEPLOYMENT INFORMATION

SOLUTION DIAGRAM

Symantec Backup Exec Quick Recovery & Off-Host Backup Solution

**Backup Exec Media Server**
- Symantec Backup Exec 10.0 or later
- Symantec Advanced Disk Based Backup Option
- Symantec Backup Exec Exchange Server Agent
- VERITAS Storage Foundation 4.3 for Windows

**Exchange Server**
- Microsoft Windows Server 2003
- Microsoft Exchange Server 2003 with SP1
- Symantec Backup Exec Remote Agent for Windows
- VERITAS Storage Foundation 4.3 for Windows
- VERITAS FlashSnap Option

**Exchange data flow**
- Mirror mounted on backup server
- Backup data flow

**SAN**
- Disk Array
- Tape Library
- Shared SAN Storage
- Hardware Arrays or JBODs

**LAN**
- Exchange Server 2003
- Backup Server

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SOFTWARE COMPONENTS

Exchange Server
- Microsoft Windows Server 2003, Standard, Enterprise or Datacenter Edition
- Microsoft Exchange Server 2003, Service Pack 1
- Symantec Backup Exec Remote Agent for Windows
- Veritas Storage Foundations for Windows
- Veritas FlashSnap Option

Backup Exec Media Server
- Symantec Backup Exec for Windows Servers
- Symantec Backup Exec Agent for Microsoft Exchange Server
- Symantec Backup Exec Advanced Disk-based Backup Option
- Veritas Storage Foundations for Windows

DEPLOYMENT BEST PRACTICES
- Fibre Channel and iSCSI SANs are both supported with this solution
- The system and boot volumes should reside on a separate disk (Harddisk0).
- Microsoft Exchange Server supports snapshots at the Exchange Storage Group level only using VSS
- The hardware for your snapshot solution should include sufficient storage to be able to create dynamic volumes on separate disks for the following purposes:
  - databases
  - transaction logs
  - split-mirror snapshots of the database stores and transaction logs volumes
- Exchange Storage Group databases and transaction logs can be located on direct attached storage (SCSI or ATA Disk Drives), or located on any SAN based storage array or JBOD
- Quick Recovery Snapshots can be located on Direct Attached Storage (SCSI or ATA Disk Drives) or located in any SAN based array or JBOD
- Off-Host Backup Snapshots must be located on SAN based shared storage accessible by both the Exchange Server and Backup Exec Media server
- The initial Exchange Snapshots should be set-up the first time during times with low system activity. This initial ‘SnapStart’ operation is a one-time event that can be a lengthy process
- Database stores and transaction logs for each storage group must be stored on disks contained within a single dynamic disk group.
- Each database should be in a separate volume, but the volumes may share the same dynamic disks.
- Mailbox stores and public stores must be stored on separate volumes in order to be able to recover each independently.
- Database stores and transaction logs must be in separate volumes in order to perform a roll-forward recovery to the point of failure.
- Database stores and transaction logs should be on separate disks so that disk failure does not affect both the database stores and transaction logs.
- Transaction logs should always be configured in a redundant layout. The preferred software layout is RAID 0+1 (mirrored striped) volumes as this provides better read and write performance than RAID 1 (mirrored) alone. The transaction log will generate the most I/O and thus should use the highest performance disks available.
- The preferred layout for the database stores is hardware RAID 5, software RAID 1 (mirrored with logging enabled) or software RAID 0+1 (mirrored striped). Note FlashSnap is not supported for software RAID 5 volumes.
- No more than six volumes should be associated with a storage group. One volume should contain the transaction logs and up to five other volumes may contain databases.
- By default, the First Storage Group is mapped to the boot drive. The boot drive cannot be snapshotted. Move the components of the First Storage Group to new volumes not on the boot drive.
• Create a unique name for the metadata file of each shadow copy set you create and maintain.
• Periodically backup your metadata files to ensure they will be available for recovery.
• For Quick Recovery solutions, Veritas recommends that you create or refresh a shadow copy set immediately after a Full Backup just after the database has been checked for corruption and the transaction logs have been truncated. Thus, you are assured an image of a clean database. Additionally, you may wish to create another shadow copy set after an Incremental Backup. Create this shadow copy set on a separate set of disks rather than refreshing the shadow copy set taken after the Full Backup. This practice ensures you are not overwriting a shadow copy set of a clean database with an image of a potentially corrupted database.

FOR MORE INFORMATION

Symantec Backup Exec
http://www.Veritas.com/Products/www?c=product&refId=57

Symantec Backup Exec - Advanced Disk Based Backup Option
http://prod.Veritas.com/Products/vnet?c=option&refId=368&productId=57

Veritas Storage Foundation for Windows
http://www.Veritas.com/Products/www?c=product&refId=31

Veritas FlashSnap
http://www.Veritas.com/Products/www?c=option&refId=261&productId=31