

# Microsoft VSS-Consistent Snapshots for Exchange Servers

Using FlashDisk VX-3400 Series Disk Arrays and FlashDisk Global Manager

### Snapshot Technology Streamlines Backup Operations

Downtime and loss of data are two of the most intimidating threats to business operation. Besides unpredicted profit loss and restoring efforts, they may even lead to legal issues. To achieve business continuity and data protection, how to do efficient backup and recovery is both a necessary concern and an unavoidable challenge. Before the invention of snapshot technology, traditional backup and recovery operations (full backup/full restore) suffer from some common annoyances, such as the difficulty of backing up running applications, prolonged backup time, lengthy recovery procedures, poor application server performance during backups, and rapidly consumed capacity. Snapshot technology efficiently addresses these problems by enabling the creation of point-in-time copies. These copies keep only data differentials, so they can be created in a few seconds, exert almost no influence on the application server performance, and occupy little disk space. When a snapshot image is taken, host I/O is temporarily held; therefore, these copies are also quite reliable. The impact to the live application is reduced to the few-second suspension of I/O. When a full backup is necessary, the backup server will take over the task of copying the snapshot data to backup media, thus allowing application servers to concentrate on application operations.

#### Microsoft VSS Solves Compatibility Issues

As illustrated above, snapshots prove to be a great help of streamlining backup operations; however, to make use of its capability requires integrating it with the backup software, the applications, and the storage systems to be backed up. Compatibility issues between vendors are the main problem interfering with the integration. In the past, IT managers solved this problem by using scripts to enable the coordination of the three elements. Finding that scripts are difficult to create and maintain for long-term proper operation, Microsoft built a technology in Windows Server 2003 named Volume Shadow Copy Service (VSS). VSS serves as the architecture on which VSS-compliant backup software, applications and storage hardware can work with one another for efficient backup and restore operations. To make the convenient service available to users, Winchester Systems has made the snapshot functionality of its proprietary storage management software, FlashDisk Global Manager, VSS-compliant. Below we will further illustrate how FlashDisk Global Manager snapshots can be used to do the backup and restore of FlashDisk VX Series arrays by working with Symantec Backup Exec12 through the VSS framework.

## **VSS Basics**

VSS is often represented as a triangle-shaped framework whose three vertices are Requester (backup software), Writer (database application) and Provider (storage hardware).



## Backup procedure

- 1. The requester commands the start of the backup job.
- 2. The writer flushes data and guarantees the consistency of the dataset to be backed-up.

3. The hardware provider creates a snapshot of the data and maps it to the host where the requester is installed.

- 4. The requester backs up the snapshot image to the target device.
- 5. The hardware provider unmaps the snapshot image and deletes the snapshot image.

# Application Example of Microsoft Exchange Server Backup

### Server and Software Requirements

- 1. Microsoft Windows Server 2003 x64 (service pack 2)
- 2. Microsoft Exchange server 2007 (service pack 1)
- 3. Symantec Backup Exec v11d.7170 or Backup Exec v12.

## FlashDisk VX Series Array Configuration

Choose a previously created, snapshot enabled partition of desired capacity to use as the Exchange source volume and map it to the host as a LUN.

Ele Information	(192.168.150.44) WINSY	5 Demo	ervices Language Help							
VX3418R Arra	ay (192.168.150.44)	Host LUN M								
Device										
🕀 🕖 Inform	ation	Char	nnel ID SCSI ID	ĺι	UN Set	Logical Volume/Snapshot Image ID	Partition	Size	Extended Lun	
🕀 🐺 Mainte	enance	0	10	0		36E73E7A58D48B74	0	20 GB	N	
🕀 📑 Config	juration									
- 🔁 Qu	lick Setup									
	eate Logical Drive									
- S Fxi	isting Logical Drives	Extended Lun(	s)	,		WWN Name(s)				
De	leted Logical Drives	Lun Number	r Logic Parti Snapshot Logical Vo	olum Gr	oup Host ID	Host V	VWN Name	Ho 10000000002971A709	st ID	
	este Logical Volume					The second secon		1000000007714705		
	inting Logical Volumes									
	annen									
Logical Volume(s)										
System Settings										
storag	Partition(s) of Logical Volume. Exchange(0.362/367/Abs048674)									
🗄 🔂 Ageni		1	U							
		1	Inde	ex: 0, Nam	ne: Exchange,	ID: 0E7FA9132AEDC987, Size: 20 G	B Mapped			
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Index	Severity	Туре	Time				Description			
862	î	<u>.</u>	2010 Apr 20 23:52:21		DataService N	OTICE - VolumeMirror 0( VP ID:34AFCDDD	070816160 ) Async Compl	lete (0 MB Transfered) (slot a	4)	
863	i	<u></u>	2010 Apr 20 23:52:21		DataService NOTICE - Image( SI ID:0DCA63503D371DCA ) Deleted Complete (slot A)					
864		<u> </u>	2010 Apr 20 23:52:24		DataService NOTICE - Image( SI ID:06AC082F3F483242 ) Deleted Complete (slot A)					
865		<u></u>	2010 Apr 21 00:01:59		DataService NOTICE - Image( SI ID:68CA1553136B439E ) Creation Complete (slot A)					
866		<u></u>	2010 Apr 21 00:02:02		DataService N	OTICE - Image( SI ID:214FDB663CE95BA	8 ) Creation Complete (sk	ot A)		
867			2010 Apr 21 00:02:06		DataService N	OTICE - Image( SI ID:68CA1553136B439	E ) Activated (slot A)			
868		<u></u>	2010 Apr 21 00:02:07		DataService N	OTICE - Image( SI ID:214FDB663CE95BA	8 ) Activated (slot A)	(1		
869			2010 Apr 21 00:02:08		DataService N	OTICE - VolumeMirror 0( VP ID:34AFCDDE	070816160 ) Async Start (	(slot A)		
870			2010 Apr 21 00:02:08		DataService N	UTICE - VolumeMirror U( VP ID:34AFCDDE	70816160 ) Async Split (:	SIDE HJ		
8/1			2010 Apr 21 00:02:16		DataService N	OTICE - Volumemirror U( VP ID:34AFCDDL	5/U81616U ) Async Compl	ete (UMB Transfered) (slot i	4)	
972		<u> </u>	2010 Apr 21 00:02:17		DataService N	OTICE - Image( 51 ID:68CA1553136B439	<ul> <li>Deleted Complete (slot</li> <li>Deleted Complete (slot</li> </ul>	(A)		
013 E. 41. 11. [6			2010 Mpf 21 00:02:19		Databervice N	o rice - inlage( of to:214Pbbb63CE956A	o y poleceu complete (sio	(m)	•	
Event Log List	Uningulation List							O entrellen Theorem	2040 4mm 24 42:50 (	
								Controller Time :	: 2010 Apr 21 12:58 [+00:00]	

Scan all the available disks under Windows 2003 Device Manager. A new "WINSYS SCSI Disk Device" should be displayed in the component list window.



Initialize this new WINSYS SCSI device and assign a drive letter (For example, 'G') to the disk in the Disk Management window. Note that the disk should be formatted using the Basic-MBR mode.

Install the Exchange database in the initialized disk.

## Indicate the Backup Device

Launch Backup Exec.

Create a backup device to which the backup data can be saved. Click Devices tab. Expand the Devices tree in the lower pane and right-click on Backup-to-Disk Folders. Select New Backup-to-Disk Folder.

	Restore 👻	Media :	Servers	Job Setup	Job Monitor	Alerts	Reports	Devices
ıl Tasks	s (\$)	Devic	es - 11 Items				-	
ame			Storage De E Device	vices Pools			Media Label	A Med
te Ierties			🗄 🔂 All 1	Devices (TSD31)			MG000001	Med
Tacks				and-alone Drives			IMG000002	Med Med
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ble				EXCH Back	up-to-Disk Wizard		IMG000005	Med
ne.			- 🍋 Rer	movabl <u>N</u> ew	Backup-to-Disk Folde	r	IMG000007	Med
Tasks	۲		Cas	scaded Add	Shared Backup-to-Dis	k Folder	MG000008	Med
alog med	la						IMG000009	Med
ore dat t media	Э						IMG000010	Med

In the pop-up window, indicate the path of the backup device, and then click OK. Now the backup device is ready.

## **Exchange Server Backup Procedure**

#### Open a New Backup Job in Backup Exec.

From the left-side tree, click Selections under Source, and then select the source you want to backup in the right-side pane by ticking the checkbox. Note: Select the disk folder where the mail box resides (e.g., the "EXCH2007" folder in disk G), and also the "EXCH" database in Microsoft Information Storage.

Source	Selections			
Selections	Selection list name:	Ferrore		
Resource Order	Backup 00004	Load selections from existin	g list Iv Include subdirectories	
Resource Credentials	Selection list description:	Include /Evolude	🔽 Show <u>file</u> details	
Priority and Availability	backup db + disk			
Selection List Notification				
Destination	View by Resource View Selection Details			
Device and Media	🗄 🔄 🗐 dt9303556	A Name	*	
Settings	🕀 🗖 🖶 🔲 🗐 dt9305291		Address	
General	🖃 🔽 🗊 ifttsd-e2k7en64	ne	C:	
Advanced	🗄 🖃 🥘 Address	līe	D:	
Network and Security			E2K7SP1EN64	-
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Advanced Disk-based Backup			G.	-
Microsoft SUL	🖻 – 🗾 🚍 G:		Microsoft Information Store	
Microsoft Exchange	😟 📃 🛅 Backup Exec	AOFO Store	Resourcess	
Microsoft SharePoint	庄 🗍 🔂 CPS		Shadow Copy Components	
Microsoft Active Directory	😟 🗹 🚞 EXCH2007		share	
Lotus Domino			System State	
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DB2	庄 📃 💭 Resources\$			
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Schodulo				
schedule	· · · · · · · · · · · · · · · · · · ·			F
	- Lenna			

Note: Please make sure the backup server has the right to access the Exchange server.

Source	Hesource credentials			200
Selections	Resource	Logon Account	Test Results	
Resource Order	🚽 ifttsd-e2k7en64	.t EXCH	Successful	
Resource Credentials	💮 First Storage	G	Successful - used server credentials	Test
Priority and Availability	💮 Second Stora	ag	Successful - used server credentials	<u></u>
Selection List Notification	G:		Successful - used server credentials	Test Sel
Destination				-
Device and Media			- 56	Cancel
Settings				
General				Chana
Advanced				
Network and Security				Clea
Pre/Post Commands				
Advanced Open File				
Advanced Disk-based Backup				

To do this, add an account from Resource Credentials under Source.

2				
ase select a jogon account from	n the list:			
ccount Name	User name	Default	Туре	Owner
EXCH	BK2007EXCH	Yes	Restricted	TSDDNS\Admini
' System Logon Account	TSDDNSVAdmin		Lommon	TSDDNS VAdmini

#### Select a backup device.

Go to Device and Media under Destination; select a backup device as the destination from the pull-down list in the right-side pane. The backup data will be stored in the chosen device. (See the previous section for how to create a backup device.)

ource	Device and Media
Selections	Device:
Resource Order	FXCH
Resource Credentials	Device Pool
Priority and Availability	All Devices (TSD31)
Selection List Notification	TSD31
estination	EXCH
Device and Media	
Canada	Keen Data Infinitelu - Do Not Allow Overwrite
Aduppend	
Network and Security	
Pre/Post Commands	When this job begins
Advanced Open File	C Overwrite media
Advanced Disk-based Backup	Append to media, overwrite if no appendable media is available
Microsoft SQL	
Microsoft Exchange	<ul> <li>Append to media, terminate job if no appendable media is available</li> </ul>
Microsoft SharePoint	
Microsoft Active Directory	Lect media after job completes
Lotus Domino	🔽 Retension media before backup
Oracle	Lise Write once, read many (WOBM) media
DB2	
NetWare SMS	Multiple data streams (Dracle and DB2 only)
Linux, Unix, and Macintosh	Maximum number of devices to use for resources that support multiple data streams:
NDMP Fatamire Vault	Minimum and a state to the State design and the State
Enterprise Vault	Minimum number of devices, terminate job ir fewer devices are available:
requercu	
Schedule	

#### Enable VSS Snapshot Support.

Go to Advanced Open File under Settings. Click Microsoft Volume Shadow Copy and make sure to select Automatic-Allow VSS to select the snapshot provider from the Snapshot provider pull-down list. When finished, click Run Now.

Source	Advanced Open File
Selections	Vise Advanced Open File Option
Resource Order Resource Credentials Priority and Availability Selection List Notification <b>Destination</b> Device and Media Settings	Open file configuration           C         Automatically select open file technology           C         Symantec Volume Snapshot Provider (Windows 2000 and 2003 only)           Use the Advanced Option File Option (AOFO) wizard to configure the Symantec Volume Snapshot Provider for use with AOFO.           AOFO Wizard
General	
Advanced	Veritas Storage Foundation for Windows FlashSnap Option (Windows 2000 and 2003 only)
Network and Security	Microsoft Volume Shadow Copu Service (Windows 2003 and later)
Pre/Post Commands	
Advanced Upen File Advanced Disk-based Backup	Snapshot provider: Automatic - Allow VSS to select the snapshot provider
Microsoft Sez Microsoft Exchange Microsoft SharePoint Lotus Domino Oracle DB2 NetWare SMS Linux, Unix, and Macintosh NDMP Enterprise Vault	Process logical volumes for backup one at a time Note: The Advanced Open File Option settings apply to all backup selections in the job, including file system and database selections.
Notification Frequency Schedule	

Go to Microsoft Exchange under Settings, and select the check box Use Backup Exec Granular Recovery Technology (GRT) to enable the restore of individual mailboxes, mail messages, and public folders from Information Store backups.

Information Store Backups
Backup method:
Full - Database & Logs (flush committed logs)
Continuously back up transaction logs with Backup Exec Continuous Protection Server
Make a recovery point that creates browsable backup sets and 1 🚆 Days 💌
Without recovery points, individual mail messages and folders can only be recovered from the last full backup
Use Backup Exec Granular Recovery Technology (GRT) to enable the restore of individual mailboxes, mail messages, and public folders from Information Store backups (Exchange 2000 and later only; incremental backups supported with policy-based jobs only) Guide Me
Perform consistency check before backup when using Microsoft Volume Shadow Copy Service (VSS) snapshot provider     Continue with backup if consistency check fails     If Exchange 2007 backup <u>s</u> ource is LCR or CCR:
Back up from the passive copy and if not available, try the active copy (recommended)

Verify the settings in the job summary window and click OK. A backup job should then initiate immediately.

#### Check Whether the Snapshot Is Taking Place

After running the backup job using the Backup Exec software, check for the following events in the FlashDisk Global Manager:

A snapshot image should have been taken.

At first, a notification event (Snapshot NOTICE – SI ID:xxxxx Creation Complete in SS ID:xxxx) will prompt you, indicating that a *Snapshot Image (SI)* has been taken. Meanwhile, a snapshot image will be activated with another notice event (Snapshot NOTICE –SI ID:xxxx).

![](_page_11_Picture_4.jpeg)

The snapshot image will then be mapped to an available host LUN, and data will be copied to the device location you previously set on the backup server running Backup Exec.

😹 VX3418R Array (	192.168.150.44) WINSY	5 Demo	den language lieb						-		
VX3418R Array	/ (192.168.150.44)	Host LUN Ma	pping								
E-			<b>-</b>								
🖶 🔞 Informa	ition	Host LUN(s)			LSet Logic	al Volume/Spanshot Image ID	Partition	Size	Extended Lup		
🕀 🛐 Mainter	nance	<u>₹</u> 0	10	0	36E73E	A58D48B74	0	20 GB	N		
Configu	ration	0	10	1	109153:	A57C487E7			N		
Qui	ck Setup										
- 🔁 Cre	ate Logical Drive										
Evic	ting Logical Drivac	Extended Lun(s)				WWN Name(s)					
	ang Logical Drives	Lun Number	Logic Parti Snapshot L	ogical Volum Grou	p Host ID Host		WWN Name		Host ID		
l Deli	eted Logical Drives					WWN Name		10000000009714	4709		
Cre	ate Logical Volume										
Exis	ting Logical Volumes										
Cha	innel										
Hos	t LUN Mapping	Logical Volum	ne(s)								
🔤 🗹 Sys	tem Settings	Name: Exchan	ge Size: 2.45 TB								
🖻 📑 Storage	e Services		go, o.zo. z. to to	Partition(s)	of Logical Volu	me: Exchange(ID:36E	73E7A58D48B74)				
- 🛃 Snapshot 0 1					1 2	DS Free					
	ıme Copy/ Mirror										
🖻 🎥 Agent				Index: 0, Name	Exchange, ID: 0E7	FA9132AEDC987, Size: 20	GB Mapped				
占 🗊 Storage	e Services Agent										
- 🔂 Sch	edules										
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		1									
		ļ									
Index	Severity	Туре	Time				Description				
878			2010 Apr 21 13:24:51		DataService NOTICE	- Image( SI ID:1091531A57C4	187E7 ) Activated (slot A)	21			
879	U	-	2010 Apr 21 13:24:52		DataService NOTICE	- Image( SI ID:700E5C501278	6CA3 ) Creation Complete	e (slot A)			
Event Log List Co	nfiguration List										
								Controller	Time : 2010 Apr 21 13:27 [+		

After the backup process is completed, the snapshot image will be deleted automatically. The backup job is completed

🔝 VX3418R Array (	192.168.150.44) WIN5Y	5 Demo								_ 8
File Information Ma	aintenance Command Co	onfiguration Storage Serv	rices Language Help							
VX3418R Array	y (192.168.150.44)	Snapshot Co	nfiguration							
Device		Chapshot Co	Ingulation							
🕀 🕖 Informa	ition	LV Name	Partition Name	LV ID	Partition ID	Partition	Current / Max Image	Activated	Description	Mount Status
🕀 灯 Mainten	nance	Exchange	Exchange	36E73E7A58D48B74	0E7FA9132AEDC987	0	0 / 1024	No	Description	Mount succeeded,
🕀 📑 Configu	uration	Exchange	P2 Exchange 2	36E73E7A58D48B74	1F32B1FC17FB3190	2	0 / 1024	No		Mount succeeded,
E Agent	e Services <mark>pshot</mark> ime Copy/ Mirror e Services Agent	Licitinge	EXchaingo_z			<u> </u>	071001	10	1	produk soccesses
L 💕 Olonge	edules	♥ Images in this	Snapshot Set 🏼 Ø Ir	mages manually cre	ated 🥥 Images o	reated by schedu	uler			
		Inde>	Sn.	apshot Image ID	Name		Activation Time	Map LUN		Description
Index	Severity	Туре	Т	ime			D	escription		
378	i		2010 Apr 21 13:24:51		DataService NOTIC	- Image( SI ID:10	91531A57C487E7 ) Activa	ited (slot A)		
79	Ĩ		2010 Apr 21 13:24:52		DataService NOTIC	- Image( SI ID:70	00E5C5012786CA3 ) Creat	ion Complete (slot A)		
80	Ť		2010 Apr 21 13:28:39		DataService NOTIC	- Image( SI ID:10	91531A57C487E7 ) Delete	ed Complete (slot A)		
Event Log List Co	nfiguration List								Oentreller Time :	2040 884 24 42-20 1-00-0

#### Restore Exchange Data from Backup Target

Follow the procedures below to restore an accidentally crashed mailbox or the entire mailbox.

Open a New Restore Job in Backup Exec.

Enter Source -> Selections and select a restore resource. In this case, a crashed mailbox needs to be recovered. You can select individual mailbox restore or the entire mail box for restoring a database. Below is an example of restoring an individual mailbox named "new."

![](_page_14_Figure_4.jpeg)

In Device and Media under Source, select the backup data of the source you want to restore.

Source Selections Resource Credentials Device and Media Destination File Redirection	Device and Media Choose a device to restore each group of media listed below. The media are listed in the order that is needed to restore the selections. A restore selection list and job will be created for each different device. To change the device, click the drop-down arrow in the Device column.						
	In the Device column.						
File Redirection	Media or Resource	Media Location	Restore Device or Media	a Server			
File Redirection Microsoft SQL Redirection Microsoft Exchange Bedirection	Media or Resource IMG000009	Media Location EXCH	Restore Device or Media	a Server			
File Redirection Microsoft SQL Redirection Microsoft Exchange Redirection Microsoft SharePoint Redirection	Media or Resource IMG000009 B2D000001	Media Location EXCH EXCH	Restore Device or Media TSD31 TSD31	a Server			

Make sure the following items are selected in Microsoft Exchange under Setting.

-Automatically recreate user accounts and mailboxes.

-When restoring individual mail messages and folders, restore over existing messages and folders.

-Dismount database before restore.

ource	Microsoft Exchange
Selections	Automatically recreate user accounts and mailboxes
Resource Credentials Device and Media	Note: To set the password assigned to recreated user accounts, click the Tools menu, then click Options, and then under Job Defaults, click Exchange.
estination	When restoring individual mail messages and folders, restore over existing messages and folders
File Redirection	
Microsoft SQL Redirection	Exchange vo.o
Microsoft Exchange Redirection	INO IOSS restore (do not delete existing transaction logs)
Microsoft SharePoint Redirection	Restore public folder
Oracle Redirection	Restore private mailboxes
DB2 Redirection	
Enterprise Vault Redirection	Exchange 2000 and later
iettings	Log recovery options when restoring the Information Store
General	Restore all transaction logs; do not delete existing transaction logs (no loss restore)
Advanced	Eor continuous protection jobs only restore all transaction logs until
Pre/Post Lommands	point-in-time; skip transaction logs after this time
MICROSOFT SUL	C. Burge existing data and restore only the databases and transaction logs from the backup sets
Microsoft Exchange	
Microsoft Active Directory	Path on Exchange Server for temporary storage of log and patch files
Lotus Domino	CATEMP
Dracle	
DB2	✓ Dismount database before restore
Enterprise Vault	Commit after restore completes
NetWare SMS	Guide Me
Linux, Unix, and Macintosh	
NDMP	
Notification	
requency	

Verify the settings in the job summary and click OK. The mailbox will then be successfully restored. When logging in Exchange server after a successful restore, users will receive a mailbox restore message as shown below.

![](_page_16_Figure_1.jpeg)

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