



RELEASE NOTES

EMC® NetWorker®
VSS Client for
Microsoft Windows Server 2003
First Edition

Release Notes

P/N 300-003-995
REV A03

August 8, 2007

These release notes contain supplemental information about this release of EMC NetWorker VSS Client for Microsoft Windows Server 2003. Topics include:

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Product description

The EMC® NetWorker® VSS (Volume Shadow Copy Service) Client for Microsoft Windows Server 2003 uses Microsoft VSS technology to provide backup and recovery services for file systems, application data, and operating system data.

The NetWorker VSS client allows for the creation of a point-in-time snapshot (copy) of data. Instead of backing up data directly from the physical file system, data is backed up from the snapshot. The snapshot includes exact copies of files and all open files. For example, databases and files that are open due to operator or system activity are included in a snapshot. In this way, files changed during the backup process are copied correctly. Snapshot backups ensure that:

- ◆ Applications can continue to write data to the volume during a backup.
- ◆ Open files are no longer omitted during a backup.
- ◆ Backups can be performed at any time, without locking out users.

The NetWorker VSS client enables one to manage snapshots on disk to maximize backup and recovery performance.

New features and changes

This is a first release of NetWorker VSS client and therefore there are no changes.

This section describes briefly the backup and recovery features of the NetWorker VSS client. The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide* provides more details.

NetWorker VSS client backups

Backups are configured as scheduled snapshot backups on the NetWorker server. Ad hoc (manual) backups, from either the command line or from the NetWorker VSS client, are not supported at this time. However, one can manually start a scheduled snapshot backup at any time.

The NetWorker VSS client supports three types of snapshot backups:

- ◆ Nonpersistent backup (also referred to as a live backup)
- ◆ Instant backup with or without rollover
- ◆ Serverless backup

Proxy client support

A proxy client is used to offload the processing requirements associated with serverless backups. Serverless backups free the backup client from much of the processing involved in an instant backup. These backups are particularly useful when there is additional processing involved in a scheduled backup. For example, to determine whether a snapshot of an Exchange database is consistent, the Exchange utility, **eseutil**, must be run against the snapshot. Running **eseutil** can be disk intensive. Therefore, offloading the work from the Exchange server to a proxy client frees resources on the Exchange server.

NetWorker VSS client recoveries

There are three types of recoveries:

- ◆ Conventional recovery
- ◆ Instant recovery
- ◆ Rollback recovery

By default, recoveries are performed from a conventional backup. If a conventional backup is unavailable for the selected browse time, an instant recovery is performed. The default recovery method can be specified in the NetWorker Recovery Options dialog box.

Fixed problems

This section describes fixes in this release.

Search feature needs asterisk (*) and question mark (?) search capability (LGTpa94138)

The NetWorker VSS client software now supports searching for a recovery item using the asterisk (*) and question mark (?) wildcards.

In addition to using literal or name matches, case-sensitive or case-insensitive, you can refine your search as follows:

- Single character match search using the ? wildcard.
Type ? to return single character entries and drive volumes, such as *C* or *D*
Type **ASR?Disk** to return *ASR Disk*
- Multiple character match search using the * wildcard.
Type ***.txt** to return all entries with a *.txt* extension
Type ***** to return all items within the selected container
Type ***asr*** or **asr*** to return *ASR Disk*
- Search using both the * and the ? wildcards.
Type ***??r*disk*** to return *ASR Disk*

The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide* provides more details on how to search for a recovery item, and how to use literal and name matches.

Microsoft SQL Express was backed up under Applications (LGTpa96502)

Prior to NetWorker VSS Client SP1, the initial release of NetWorker VSS Client backed up Microsoft SQL Express under Applications as part of either SqlServerWriter or MSDEWriter-SQL2000. This was not consistent with the location NetWorker VSS Client used for Microsoft SQL Desktop Engine, under System Components (System Components:\MSDEWriter). Microsoft SQL Express should have been backed up under System Components, System Components:\SQLEmbedded.

No action is required for Microsoft SQL Express backups created with NetWorker VSS Client SP1. They are now backed up under System Components, System Components:\SQLEmbedded.

To move existing SQL Express database backups under Applications to the correct grouping, System Components, do a full backup. Otherwise, restore older databases from backups in the old location under Applications.

Other fixed problems

[Table 1 on page 4](#) provides a list of other major bug fixes implemented in NetWorker VSS Client SP1.

Table 1 Fixed bugs in NetWorker VSS Client SP1

Number	Description
LGTsc01271	Manual rollover run from NetWorker VSS Client GUI sometimes crashed when there were a large number of savesets to rollover.
LGTpa96255	When using the Active Directory plug-in, the value set in the Recover option was not restored to the default value after restoration completed.
LGTpa96524	When using the nrsnap_vss_save -? option with virtual servers, option parsing was position dependent and sometimes did not list available APPLICATIONS savesets correctly.
LGTpa96549	The Recover Options dialog box allowed the user to specify an URL path as a valid relocation path. This sometimes led to recovery failure.
LGTsc00141	With Exchange running on a cluster, when taking a backup of non-Exchange data like System Components an error message was generated that Exchange credentials were not validated.
LGTsc01017	PowerSnap nrsnapagent crashed when parsing an ssres file that was present on the system.
LGTsc01106	Volumes were not browsable for recover after snapshot.
LGTsc02219	When executing nrsnap_vss_save from the command line, it crashed and did not show usage.
LGTsc00978	When using the nrsnap_vss_save -? feature to list the savesets for a virtual server, the output properly listed the saveset names for the virtual server. However, it also included any other application writer that was also on the system.
LGTpa96316	After backing up a large number of user objects (36,000), the NetWorker GUI could not be opened.
LGTpa96515	When backing up a virtual server instance of SQL Server 2005 in a cluster group, the save operation also saved another instance of SQL Server 2005 running on a different virtual server in a different cluster group.
LGTsc00099	After performing a PIT copy of System Components or Applications:\SqlServerWriter, when the saveset was checked on NetWorker VSS Client, the Required volume did not show any value.
LGTsc00335	Recover of cluster database failed with fatal errors.
LGTsc01001	If a writer specified multiple wildcard backup directories with a mix of recursion and no-recursion, when a Recursion=yes was encountered, any subsequent specifications were recursed, even if marked Recursion=no.
LGTsc01039	In the NetWorker VSS Client GUI, "Remove all" option was not working in the Task frame.
LGTsc01119	Applying retention policy took a long time to complete.
LGTsc00979	When using the nrsnap_vss_save -? feature to list the savesets for the localhost, saveset also listed any SQL virtual servers that were also on the system.

Environment and system requirements

The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Installation Guide* lists hardware and software requirements for the NetWorker VSS client.

Known problems and limitations

This section provides known problems and limitations for this release:

Unsupported NetWorker features

The following NetWorker client features are not supported in the NetWorker VSS client software:

- ◆ Directed recovery
- ◆ DES Encryption (new feature in NetWorker 7.3.2)
- ◆ NetWorker clone operations
- ◆ NetWorker archive operations
- ◆ When installed on a NetWorker storage node, NetWorker VSS client can be used as a proxy host, but cannot be used as a VSS client.

After performing successful savegroup, not all save sets in group are reported (LGTsc00545, LGTsc00114)

After you perform a successful savegroup, not all of the save sets that were part of the savegroup are reported. Even though the savegroup executed successfully, only the first save set, the index, and the bootstrap (if applicable) are listed in the savegroup email notification, the completion report, and the NetWorker Management Console.

Symmetrix cannot take VDEV snapshot with Solutions Enabler version 6.3.1 (LGTsc01197)

When you run Solutions Enabler version 6.3.1 with a Symmetrix® storage array, Symmetrix is unable to take a VDEV snapshot. Symmetrix BCV replicas are unaffected.

List of virtual clients on a clustered host must be updated manually (LGTsc01100)

The list of virtual clients on a clustered NetWorker VSS client host does not refresh automatically. If the NetWorker VSS Client software is open and one of the virtual clients is moved to another host, you must refresh the list of virtual clients manually.

Workaround

To refresh the list of virtual clients on a clustered host:

1. From the toolbar of the VSS Client window, go to **Options > Configuration Options**.

The **Configuration Options** dialog displays.

2. Click **Client** (the button at the top-right corner of the dialog).
3. Click **OK**.

The list of clients will now be correctly displayed in the Clients dropdown list from the application toolbar.

Rollover failure indicator does not display if one saveset in snapshot rollover fails (LGTsc00862)

When you rollover a snapshot containing multiple savesets and one of the savesets fails to rollover successfully, the rollover failure indicator (the red ball icon at the bottom right of the window) does not display. However, the Monitor tab still displays the correct information about the status (success or failure) of each save set included in the rollover operation.

Select/Deselect action in VSS window may be delayed after rollover (LGTsc00858)

After you perform a rollover and then expand the tree to select/deselect files and folders, the NetWorker VSS session window shows the animation, but may not display the cursor on the selected record for several seconds after the activity is performed. This makes it difficult to determine whether the activity is in progress or not.

Workaround

Wait a few seconds for the activity to complete. If there is still no indication that the activity is in progress, try selecting the file/folder again.

SQL 2005 databases in recovery state are not skipped during backup or restore (LGTsc00754)

SQL 2005 databases in the recovery state are not skipped during a conventional backup or snapshot restore; the SQL Server Writer does not list database files in the recovery of the file system. This problem only occurs when you perform a file system backup of the file systems that contain these SQL database files. As a result, when you restore the file system where these databases reside, the files are overwritten.

Workaround

If the databases were participating in SQL Log Shipping, recreate the database from a fresh backup of the source, then reenables log shipping.

VSS Client window may not open if a large number of user objects in container (LGTsc00673)

If an Active Directory container has a large number of user objects, then the NetWorker VSS client window may not open.

Conventional incremental backup does not save renamed files (LGTsc00665)

If, after performing a conventional full backup of a drive, you rename files and then perform a conventional incremental backup of the drive, the renamed files will not be saved and will not be browsable for recover in the VSS Client window.

Replica creation fails when using Emulex adapter (LGTsc00506)

Replica creation fails if performed using a machine with Solutions Enabler version 6.2.x or earlier with an Emulex STORPort driver and Microsoft Windows Server 2003 SP1. Solutions Enabler version 6.2.x or earlier relies on the vendor's SNIA library to get HBA information, but version 1.20a3 or later of the Emulex STORPort driver does not install this .dll file.

Workaround Upgrade to Solutions Enabler version 6.3.1.7 or later; this version leverages the Microsoft installed SNIA library instead of the vendor specific SNIA library.

No volumes displayed for a snapshot not rolled over (LGTsc00142)

There are no NetWorker volumes associated with a snapshot backup until the snapshot has been rolled over to a NetWorker server. If you select to view the required volumes for a System Component or application data snapshot not rolled over, no volumes will be displayed.

Recover may fail if performing continuous recovery operations after mounting a volume (LGTsc00119)

If you mount a file system snapshot in the NetWorker User window and perform continuous recovery operations throughout the day, PIT recover may fail. If the recover fails, **nsrsnapbragent.exe** does not close and continues to run as a process in Windows Task Manager, and remounting does not occur.

Workaround Close NetWorker User and restart the program.

Invalid temporary path created during Event Log writer recovery (LGTpa96400)

When you recover a writer such as the System Components Event Log writer, an empty subdirectory is created at C:\temp\nsr_recover\timestamp\...\ServiceState\EventLogs, where timestamp indicates the time and date of the recover operation. The creation of this subdirectory does not create any performance issues, but does cause the nsr_recov directory to not be removed after rebooting the system.

Workaround After the client is rebooted, manually delete the nsr_recover directory.

Unable to browse save sets created by VSS client after downgrading from VSS client software to non-VSS client (LGTpa96395)

If, after installing the NetWorker VSS client software, you perform a save or rollover save operation and then decide to downgrade to a non-VSS client, you cannot browse the save sets created by the VSS client on the downgraded client software. This is because the format of the client file index entries changed with NetWorker VSS Client, and previous NetWorker clients do not recognize this format.

NetWorker VSS client can only be used as proxy client when residing on same host as a NetWorker server (LGTpa93324)

When installed on the NetWorker server or storage node, the NetWorker VSS client software can be used as a proxy client but not used as a NetWorker VSS client.

NetWorker Storage node support for a proxy client (LGTpa95037)

Although the NetWorker VSS client software cannot be installed on a NetWorker storage node, a NetWorker storage node can be set up as a proxy client data mover.

A proxy client allows one to offload processing requirements from an application server (NetWorker VSS client) to a proxy client. An additional benefit to setting up the NetWorker storage node as a proxy client is that network traffic is avoided when a snapshot is rolled over to tape. This is because the tape device is directly attached to the storage node.

To install the proxy client software on a NetWorker storage node, use the NetWorker VSS client installation package.

Changed scope of save set (LGTpa88857)

The save set specification **All** includes all volume data and Windows system component data. The save set **All** does not, however, include application data such as Microsoft Exchange or SQL databases.

EMC VSS Provider cannot take a snapshot of the volume on which Solutions Enabler is installed (LGTpa90841)

A CLARiiON or Symmetrix volume supported with the EMC VSS provider cannot take a snapshot of the volume on which Solutions Enabler is installed. Additionally, the volume on which Solutions Enabler is installed cannot be included in the same client resource and backup group with a CLARiiON or Symmetrix volume.

More information about this issue is provided in the EMC Solutions Enabler documentation.

- Workaround** To protect a NetWorker VSS client using CLARiiON or Symmetrix storage:
- ◆ Install Solutions Enabler on a local volume (a volume that is not a CLARiiON or Symmetrix volume). When Solutions Enabler is installed on a local volume, the snapshot is taken with the software-based VSS System provider.
 - ◆ Do not specify save set **All**.
 - ◆ Create at least two client resources for the NetWorker VSS client. Create one client resource for the local volume on which Solutions Enabler is installed and create another client resource for the CLARiiON or Symmetrix volumes. Local volumes without Solutions Enabler installed can be included in any client resource.
 - ◆ Ensure that the client resource for the local volume on which Solutions Enabler is installed and the client resource for the CLARiiON or Symmetrix volumes are not assigned to the same backup group.

If installing Solutions Enabler on a CLARiiON or Symmetrix volume, be aware that you cannot take a snapshot of that volume using the EMC VSS provider.

Snapshot cannot include both CLARiiON and Symmetrix volumes (LGTpa91221)

A client resource cannot include both CLARiiON and Symmetrix volumes in the same save set. Additionally, save set **All** cannot be specified for such a client resource. If both CLARiiON and Symmetrix volumes are included in a save set, the backup will fail.

- Workaround** If a NetWorker VSS client has both CLARiiON and Symmetrix volumes, create at least two client resources: one for CLARiiON volumes and one for Symmetrix volumes. Additionally, do not specify save set **All** in any of the client resources for the NetWorker VSS client.

Import copy error while restoring from a snapshot (LGTpa94923)

If a snapshot becomes unrecoverable from the storage subsystem, it may appear to be recoverable in the NetWorker VSS client interface. In this case, initiate the recovery of an application snapshot or a Windows system component snapshot. However, the recovery operation will fail with an import error. In the case of file system snapshots, the error may occur when you attempt to mount the snapshot.

- Workaround** Verify whether or not the snapshot is recoverable. If the snapshot is unrecoverable, remove the snapshot record from the NetWorker media management database.

To verify whether the snapshot is recoverable, use the tools associated with the VSS provider.

To remove the snapshot record:

1. Access the Snapshot Management view in the NetWorker VSS client application.
2. Select the snapshot and delete it.

The EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide provides more information about using snapshots.

Recovering files to a deleted mount point (LGTpa95055)

To recover data to a deleted mount point, manually re-create the mount point before recovering the data. Re-creating the mount point enables the data to be recovered to the remote mount point location. Otherwise, the data is recovered to a local directory and the local directory name is the deleted mount point.

Exchange backup requires that the System Path and Transaction Log be set to the same location (LGTpa93254)

When performing a backup of Microsoft Exchange, specify the same directory location (such as E:\) for both the System path and the Transaction log under the Storage Group properties in Microsoft Exchange System Manager.

Exchange database and log files must reside on separate volumes (LGTpa93680)

Database files and log files must reside on separate volumes for the Exchange server. Backup will fail if they are on the same volume.

SQL Recovery and Restore limitations (LGTpa93026)

The following SQL recovery and restore operations are not supported for this release:

Automated stop and start of SQL services

You may have to manually shut down some SQL services to restore SQL system databases. For SQL 2000, manually shut down the SQL Server and the SQL Server Agent. For SQL 2005, shut down the master database only if it is being recovered; otherwise, do not shut down any SQL 2005 database services.

Workaround Manually stop and start SQL services using SQL Service Manager.

Open **sqlmangr.exe** from the **Processes** tab of the Windows Task Manager, then select the services you want to stop (for example, SQL Server Agent) from the drop-down.

Specifying No-Recovery restore

During recovery, you cannot specify that the SQL database be restored to a No-Recovery state. As a result, you cannot replay transaction log backups.

Renaming the database during recovery operation

The database cannot be renamed during recovery.

Directed recovery

During recovery, you cannot restore the SQL database to a server other than the one on which the database was originally backed up.

Differential backup and recovery

Differential backups and recoveries for SQL databases cannot be performed.

Automated Attach Database after restore

To reattach a previously deleted database after a restore operation, perform this operation manually.

Automated SQL Rollback

When you perform a rollback on SQL databases, manually dismount and detach the SQL databases.

Workaround In the case of an SQL Server Rollback restore, stop the SQL Server service from the services control applet. If the SQL Server service is not stopped, then Rollback restore fails with the error “Cannot unmount the volume.”

Database copy backup type

Database copy backups (backups that do not use transaction logs) are unavailable.

SQL backups with the MSDE Writer fail if a database is in suspect mode (LGTpa94615)

If any of the databases belonging to a SQL instance are in suspect mode, and a backup of the SQL instance is attempted with the Microsoft MSDE Writer, the snapshot backup will fail with the following error:

```
[3844] [S] 10/27/06 11:19:24 RM .. 027121 ERROR: MSDEWriter has
failed at prepare snapshot. The error is
VSS_E_WRITERERROR_NONRETRYABLE. The code is: 0x800423f4. Check the
application event log for more information.
[3844] [S] 10/27/06 11:19:24 RM .. 026003 ERROR: Application Agent
operation thaw has failed with an error...
```

Workaround Either delete or repair the suspect databases.

Backing up data for a Microsoft Exchange or SQL application (LGTpa91971)

When backing up data for a Microsoft Exchange or SQL application, ensure that all databases are mounted. Unmounted databases are not backed up, and no warning appears during the backup operation to indicate if any databases are unmounted.

NetWorker Console server version 7.3.2 or higher cannot reside on a NetWorker VSS client (LGTpa93061)

You cannot install the NetWorker Console server version 7.3.2 or higher on a NetWorker VSS client. It is best practice to place NMC into a centralized system, generally onto a NetWorker server. However, if required, it is possible to install NMC version 7.3.1 or earlier onto a NetWorker VSS client.

Mounting one volume will mount all volumes in snapshot (LGTpa94348)

When mounting a volume for restore, all volumes included in that snapshot are also mounted. For example, if drives C:, D:, and E: are included in the snapshot and then you mount a directory from drive C: for restore, drives D: and E: also get mounted. The mounting of all volumes in the snapshot causes drive letters to be used up.

Limit of eight volumes included in save set for a client resource (LGTpa94348)

There is a limit of eight volumes included in a snapshot that is supported with the EMC VSS Provider.

Workaround

To back up more than eight volumes for a NetWorker VSS client host:

1. Create separate client resources for the host and limit the save set for each client resource to eight volumes.
2. Ensure that client resources are assigned to different backup groups so that no backup group contains more than eight volumes for a particular NetWorker VSS client host.

Note: Other hardware providers have their own limit for volumes included in the snapshot. Consult your provider's documentation for specific limits.

Snapshot automatically unmounted during recovery (LGTpa92555)

When a file system snapshot is mounted in the NetWorker VSS client interface, and one starts a recovery operation, the file system snapshot is automatically unmounted. To remount the snapshot, restart the NetWorker VSS client application.

Recover fails for password protected and encrypted legacy backups (LGTpa90937)

Backup data that was password protected and encrypted with a non-NetWorker VSS client cannot be recovered from the NetWorker VSS client user interface.

Workaround

Use the **recover.exe** command line interface to recover this data. The *NetWorker Command Reference Guide* provides more information about using this command.

Snapshot may fail to import when QLogic SanSurfer running (LGTpa90724)

Snapshots supported with a hardware provider may fail to import if the QLogic Management Suite Java Agent service running, and return a getoperation error.

Workaround

Use the QLogic SanSurfer utility to stop the QLogic Management Suite Java Agent service. Manually start the service only when required and then manually stop the service. The Primus eServer Solution article, emc129473, provides more information.

Character support for names of backup files and directories (LGTpa89319)

The backup of files and directories fail if they have file and directory names containing:

- ◆ Extended ASCII characters such as those in French or Spanish.

Note: Some extended ASCII characters not symbol related may not display properly.

- ◆ Unicode characters. These characters are often used in Asian languages.

Rollover backups do not occur in parallel (LGTpa85933)

Rollover backups for multiple save sets in the client resource occur sequentially instead of in parallel, causing backups to take longer than normal. However, if any save sets are writer save sets (for example, SQL writer) and the writer has files on multiple volumes, the rollover of this save set occurs in parallel, with multiple streams for each of the volumes containing the writer files. Conventional backups (nonsnapshot) occur in parallel.

Adhoc/Manual backups are not supported (LGTpa89013)

Backups are configured as scheduled snapshot backups on the NetWorker server. Ad hoc (manual) backups, from either the command line or from the NetWorker VSS client, are not supported. However, one can manually start a scheduled snapshot backup at any time by starting its backup group in the NetWorker Management Console.

Legacy scripts may not work for the NetWorker VSS client (LGTpa88858)

The NetWorker VSS client introduces new command line programs to replace **save.exe**. The new command line programs are not supported for ad hoc backups and scripting. Additionally, the NetWorker VSS client does not support the **save.exe** program.

LDM dynamic volumes are not supported (LGTpa88800)

The NetWorker VSS client does not support snapshots for Logical Disk Manager (LDM) dynamic volumes.

Backup of raw file partitions are not supported (LGTpa89697)

The NetWorker VSS client does not support snapshot backups of raw file partitions.

FAT file system is not supported (LGTpa86691)

The NetWorker VSS client does not support snapshot backups of the FAT file system or any other non-NTFS file system such as CDs or memory sticks.

symapi warning may be displayed in data mover event viewer (LGTpa87409)

The following message may appear when a snapshot is taken and the NetWorker VSS client is supported with a proxy client:

```
StorUpdate: Could not commit database in memory to file.  
WARNING=The change cannot be committed because the disk copy of  
the database has changed
```

This message can be ignored.

Hardware import failures and freeing up LUN resources (LGTpa88834)

When an import operation succeeds, LUN resources reserved for the import operation are freed automatically. When an import operation fails, the NetWorker VSS client cannot free resources when the snapshot is deleted through retention policy on hardware storage systems such as CLARiiON or Symmetrix.

- Workaround** Free the LUN resources manually using the Microsoft **vshadow** utility or vendor supplied utilities.
- The Microsoft **vshadow** utility is available in the Microsoft Volume Shadow Copy Service SDK 7.2, which is available for download from <http://www.microsoft.com/downloads/>.
- Information about freeing resources with vendor utilities is available in the array of management utilities provided with your hardware storage systems.

Behavior of local directives on a NetWorker VSS client (LGTpa94805)

Local directives specified in a `nsr.dir` file cannot refer to a nested directory.

- Workaround** Place the directive file, `nsr.dir`, in the nested directory to which the directive applies. For example, the following directive specifies that all files with a `.dll` extension under the `C:\Windows\system32` directory must be skipped when a backup is performed.

```
<<"C:\Windows\system32">>
skip: *.dll
```

To enable the previous directive, place the directive file, `nsr.dir`, in the `C:\Windows\system32` directory. If the directive is placed in the root of the `C:` drive, it is not executed upon backup.

Mounted snapshots remain after killing the user interface (LGTpa95297)

If the NetWorker VSS client has mounted snapshot volumes and the NetWorker VSS client interface is killed using the Windows TaskManager, the snapshot volumes remain mounted.

- Workaround** Use the Windows command line utility **mountvol.exe** to unmount the volumes.

Save set consolidation limitation (LGTpa94686)

Save set consolidation is not possible with SYSTEM COMPONENTS and Application Writers. These save sets can only be backed up at level full. Save set consolidation requires that a level 1 backup and a full backup exist for the save set.

Active Directory attribute value for `msNPAllowDialin` not recovered under Windows Server 2003 SP1 (LGTpa95417)

For NetWorker VSS clients running Windows Server 2003 SP1, the value for the Active Directory attribute **msNPAllowDialin** is unrecoverable. NetWorker VSS clients that run Windows Server 2003 R2 are unaffected.

Workaround After recovering Active Directory, update the value for the **msNPAllowDialin** attribute if necessary. To edit this attribute use a Microsoft tool such as ADSI Edit, which is available by installing the Windows Server 2003 family Support Tools from the Windows Server 2003 family CD.

Cannot open multiple VSS Client session windows simultaneously (LGTpa96526)

You cannot have multiple NetWorker VSS Client session windows open simultaneously. If you start the application again while an existing session is minimized or hidden by another active window, a new VSS session will not open and focus will not be returned to the existing NW VSS client application window as expected.

Reclaiming array storage after an import failure (LGTsc03522)

When there is an import failure in CLARiiON snapshots or clones, or Symmetrix BCVs or VDEV, the snapshot session must be destroyed, synchronized, or terminated, depending on the hardware type, prior to the next backup.

Use the following examples as general descriptions of the process or procedure. Refer to the product documentation for more detailed steps and information to perform these on your system.

Workaround For CLARiiON Snapshots (DIFF):

1. In **Navisphere Manager**, locate the snapshot name and session based on the timestamp.
2. If the snapshot belongs to a Storage Group(s), remove the snapshot from the Storage Group(s).
3. Select the session and then click **Stop Session**.
4. Select the snapshot and then click **Destroy Snapshot**.

The index entry “destroy, snapshot” in the *Navisphere Manager Help* provides more detailed steps and information.

For CLARiiON Clones (PLEX)

1. In **Navisphere Manager**, locate the clone group for the source LUN.
2. Right-click the clone group you want to synchronize, and then click **Synchronize**.

The topic “Synchronizing a fractured clone” in the *Navisphere Manager Help* provides more detailed steps and information.

For Symmetrix BCVs (PLEX)

- ◆ Make the BCVs *not ready*, using EMC Solutions Enabler Symmetrix CLI (SYMCLI)

For example:

```
symdev -sid SymmID [not_ready] <BCV#>
```

The *EMC Solutions Enabler Symmetrix CLI Command Reference* and the *EMC Solutions Enabler Symmetrix TimeFinder Family CLI Product Guide* provide detailed information about using the symdev command and options.

For Symmetrix VDEV (DIFF)

- ◆ Terminate the snap session using the `symsnap` command with the `terminate` option.

The *EMC Solutions Enabler Symmetrix CLI Command Reference* and the *EMC Solutions Enabler Symmetrix TimeFinder Family CLI Product Guide* provide more information about using the `symsnap` command and options.

Snapshot cannot include both hardware and software snapshot volumes for clustered NetWorker VSS clients (LGTsc05386)

A NetWorker VSS client resource running on a cluster cannot include both hardware and software volumes in the same save set. Additionally, save set **All** cannot be specified for such a client resource. If both hardware and software volumes are included in a save set, the backup will fail.

Workaround

If a NetWorker VSS client on a cluster has both hardware and software volumes, create at least two client resources: one for hardware volumes and one for software volumes. Additionally, do not specify save set **All** in any of the client resources for the NetWorker VSS client. When using a hardware provider with a NetWorker VSS client, you must configure a proxy client and the snapshot volume must be exported to a proxy outside of the cluster.

If performing an authoritative restore for ADAM, use the `dsdbutil.exe` command line tool (LGTsc04244)

To recover objects that were deleted from the ADAM database, you must perform an authoritative restore using the `dsdbutil.exe` command line tool to mark the items you want to recover. Microsoft provides the `dsdbutil.exe` command line tool as part of the ADAM installation, and it is found in the ADAM directory.

Note: Only use this form of restore to recover objects in the ADAM database that have been deleted, such as by administrator error or similar causes. The deletion may have replicated to all instances, so the only way to recover the deleted object(s) is to perform an authoritative restore of a backup that was taken before the objects were deleted.

To recover objects in the ADAM database using authoritative restore:

1. From the **Options** menu select **System Recover Session Options**, and then select the **ADAM** tab.
2. Select **Authoritative Restore**.
3. Click **OK** to close the **System Recover Session Options** dialog box.
4. In the **Navigation Tree**, expand the **Applications** folder and select **ADAM (instancename) Writer**.
5. From the **System Recover Session** toolbar, click **Start Restore**.
6. When VSS Client completes the restore, exit the GUI.
7. From a Windows command line run the `dsbutil.exe` command line tool.
8. Use the **authoritative restore** option to mark the objects to recover.
9. Close the `dsdbutil.exe` tool and manually start the ADAM service.

For more information, type **help** when running the dsbutil.exe, or consult Microsoft documentation for “dsbutil.exe” and “ADAM.”

Multiple rollovers of PIT backup are not useful (LGTsc05271)

The NetWorker VSS client allows you to do a second or multiple rollovers. The NetWorker VSS client will try to use the first rollover for recovery despite the number of rollovers you perform.

NetWorker VSS client does not support the NetWorker pathownerignore cluster functionality (LGTpa96420)

If a cluster client is configured to use the pathownerignore functionality to back up volumes that may be visible on the client, but are not owned by it, then NetWorker will ignore those volumes and only back up the volumes owned by that client. If the backup is run in verbose mode, NetWorker displays a warning message that the volume [that is not owned by the client] is ignored and will not be backed up.

For example, if G:\ is a mapping on the client *client1* to a volume that is owned by another client *client2*, and *client1* is configured to backup the G:\ volume, NetWorker will ignore the pathownerignore file, and volume G:\ will not be backed up under *client1*. Volume G:\ must be configured to be backed up under a *client2* client resource.

Hardware snapshots require correct path for Naviseccli (LGTsc04643)

For EMC CLARiiON configurations running FLARE 24, the path or location for Naviseccli must be specified. Without this information in the configuration, hardware snapshots will fail with VSS_E_VOLUME_NOT_SUPPORTED_BY_PROVIDER.

- Workaround** To specify the path or location for Naviseccli:
- ◆ On Windows, add Naviseccli to the path, as close to the beginning of the path as possible
 - ◆ On Linux/UNIX, add a softlink in /usr/bin or /usr/sbin

Failed Cluster Database recovery of legacy VSS backups may fail without displaying error message (LGTsc06190)

NetWorker VSS Client can recover legacy VSS backups of the cluster database (VSS SYSTEM SERVICES) created prior to the upgrade to or installation of NetWorker VSS Client. The Cluster Writer Service files may be successfully recovered, but the cluster database recovery may fail without displaying a recovery failure message.

- Workaround** When recovering the cluster database, make sure that the cluster is not running on the other node.

Active Directory recovery of 50 K objects does not print all in monitoring (LGTsc06329)

NetWorker VSS Client can backup and recover 50 K objects in Active Directory. Backup shows as successful and is visible in the GUI. When all objects are selected for recovery, even though the recovery of all 50 K items is successful, monitoring does not print all recoveries.

Workaround Manually check the recovered Active Directory to verify that all objects were recovered.

When GUI is minimized during rollover, the GUI does not open again (LGTsc06558)

If a rollover is started from the GUI, and then the GUI is minimized, then the GUI cannot be opened to check monitoring status. The GUI may appear to be hung.

Workaround Wait until rollover is complete, and then open the GUI.

NetWorker VSS Client Installation will configure firewall settings (LGTsc05999)

NetWorker VSS Client will configure Windows firewall settings during installation. Users will no longer need to run the Security Configuration Wizard to create firewall exceptions for VSS Client. The SCW settings were previously saved to the configuration file NetWorkerEXT.xml, which is no longer needed.

Workaround No workaround is needed, user will be prompted to configure Windows Firewall before starting installation.

VSS Client firewall settings can also be modified after installation:

1. Click **Start**, and then click **Control Panel**.
2. Click **Add or Remove Programs**, select **VSS Client**, and then click **Change**.

Single database recovery failures with SQL Server 2000 (LGTpa90151)

After a successful backup of SQL Server writer or database, if a database is deleted and then the database is recovered through the NetWorker VSS Client, NetWorker VSS Client will report that the database is successfully restored. However, the database will not be reattached as part of the restore process, and will not appear in the SQL Enterprise Manager. The NetWorker VSS Client requires that the MSDE writer be shut down for the SQL restore. Since the writer is not online, only the database files are restored.

Workaround To view the database files in SQL Enterprise Manager, reattach the database files using the SQL Enterprise Manager Attach Database task, or use the T-Sql “sp_attach_db” stored procedure.

Note: When reattaching the database files with either of these methods, NetWorker VSS Client restores the database MDF and LDF files to their original location.

Recovery of large number of items fails if one or more items in a folder is deselected (LGTsc05792)

If one or more items is deselected in a folder that has been selected for recovery, then recovery may fail if the number of items in that folder is very large.

This scenario has occurred when testing the recovery of 50 K items in a folder.

Workaround Select all items or the entire folder, and then perform recovery. After recovery, delete any unwanted items.

Cluster disaster recovery procedures (LGTsc06252)

The steps to perform a disaster recovery of a clustered client have changed from the steps described in the *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide*. These procedures supersede the existing procedure, "Performing a disaster recovery of a clustered client," on pages 64 to 65 of the Administration Guide. The expanded procedures cover three cluster recovery scenarios:

- ◆ **Performing a disaster recovery of a clustered client (update of procedure in Administration Guide).**

This section describes how to recover a cluster from a backup created by the NetWorker VSS Client.

- ◆ **Performing a disaster recovery of a clustered client from a legacy VSS backup (new)**

This section describes how to recover a cluster from a VSS backup created before the NetWorker VSS Client was installed.

- ◆ **Performing a disaster recovery of a clustered client from a legacy non-VSS backup (new)**

Recovery of non-VSS backups of the cluster database, using the NetWorker VSS Client, does not work.

To perform a disaster recovery of a clustered client

The following procedure describes how to recover a single node in a two node cluster. The procedure assumes that you are recovering Node_B and that Node_A is available.

1. Using the Cluster Administrator on Node_A, evict Node_B from the cluster.
2. At the command prompt, type the following to clean up MSCS:

```
cluster node Node_B /forcecleanup
```



CAUTION

After cleaning up the Cluster Server, you must reproduce the preexisting application environment on Node_B so MSCS can administer the applications as it did before the node failed. One way to reproduce the preexisting application environment is to perform a recovery for each application that was previously installed on the node.

3. Using the Cluster Administrator, select **Join an existing Cluster** and type the cluster name.

4. Using the Cluster Administrator on Node_A, ensure that Node_B appears available for failover operations.
5. Stop the cluster service in Node_A by using one of the following methods:
 - Using the control panel service tool, stop the Cluster service.
 - At the command prompt, type the following:

```
net stop clussvc
```
6. Select the required items to be recovered for Node_B. The procedure differs depending on whether or not the cluster service resides on a domain controller.
If the cluster service resides on a member server and is not a domain controller:
 - a. Open the NetWorker VSS client software on Node_B.
 - b. From the left pane, select **Recover > System Recover Session**.
 - c. Select all local drives *except* for the NetWorker VSS client installation directory.
 - d. Select the **SYSTEM COMPONENTS** folder.
 - e. Under **SYSTEM COMPONENTS**, clear **ASR DISK**.
 - f. From the **System Recover Session** toolbar, click **Start Restore**.If the cluster service resides on a domain controller:
 - a. Boot the NetWorker VSS client in directory service restore mode as described in “Booting Windows in Directory Service Restore mode” in the *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide*.
 - b. Open the NetWorker VSS client software.
 - c. From the **Options** menu, select **System Recover Configuration Options** and click **NetWorker**.
 - d. Clear the **Use Microsoft best practices for selecting the system state** attribute and click **Yes** when asked to confirm your selection.
 - e. Click **OK** to close the dialog box.
 - f. From the left pane, select **Recover > System Recover Session**.
 - g. Stop the cluster service in Node_B by using one of the following methods:
 - Using the control panel service tool, stop the Cluster service.
 - At the command prompt, type the following:

```
net stop clussvc
```
 - h. Select all local drives *except* for the NetWorker VSS client installation folder.
 - i. In the **Navigation Tree**, select **BootableSystemState** and **Cluster Writer**.
 - j. Select the **SYSTEM COMPONENTS** folder.
 - k. Under **SYSTEM COMPONENTS**, clear **ASR DISK**.
 - l. From the **System Recover Session** toolbar, click **Start Restore**.
When prompted, restart node_B.
7. Start the Cluster service on node_A by using one of the following methods:

- Using the control panel service tool, start the Cluster service.
- At the command prompt, type the following:

```
net start clussvc
```

8. Using the Cluster Administrator on Node_A, confirm that the cluster resources were recovered to the point in time when the backup occurred. If you are performing regular scheduled backups, this will recover the cluster database to a point shortly before the loss of Node_B.
9. Using the Cluster Administrator on Node_A, monitor the cluster "joining" status of Node_B.
10. Using the Cluster Administrator on Node_B, verify that the cluster group can be moved between the nodes by right-clicking the group and selecting **Move group**.

To perform a disaster recovery of a clustered client from a legacy VSS backup

The procedure differs depending on whether or not the cluster service resides on a domain controller.

For cluster service on a member server

This recovery is for a VSS backup created before the NetWorker VSS Client was installed. This backup would include VSS SYSTEM SERVICES, VSS SYSTEM FILESET, and VSS SYSTEM BOOT.

The following procedure describes how to recover a single node in a two node cluster. The procedure assumes that you are recovering Node_B and that Node_A is available.

1. Using the Cluster Administrator on Node_A, evict Node_B from the cluster.
2. At the command prompt, type the following to clean up MSCS:

```
cluster node Node_B /forcecleanup
```



CAUTION

After cleaning up the Cluster Server, you must reproduce the preexisting application environment on Node_B so MSCS can administer the applications as it did before the node failed. One way to reproduce the preexisting application environment is to perform a recovery for each application that was previously installed on the node.

3. Using the Cluster Administrator, select **Join an existing Cluster** and type the cluster name.
4. Using the Cluster Administrator on Node_A, ensure that Node_B appears available for failover operations.
5. Stop the cluster service in Node_A by using one of the following methods:
 - Using the control panel service tool, stop the Cluster service.
 - At the command prompt, type the following:


```
net stop clussvc
```
6. Select the required items to be recovered for Node_B.
 - a. Open the NetWorker VSS client software on Node_B.
 - b. From the left pane, select **Recover > System Recover Session**.

- c. Select all local drives *except* for the NetWorker VSS client installation directory.
 - d. Select **VSS SYSTEM SERVICES**, **VSS SYSTEM FILESET**, and **VSS SYSTEM BOOT**.
 - e. From the **System Recover Session** toolbar, click **Start Restore**.
When prompted, restart node_B.
7. Start the Cluster service on node_A by using one of the following methods:
 - Using the control panel service tool, start the Cluster service.
 - At the command prompt, type the following:
net start clussvc
 8. Using the Cluster Administrator on Node_A, confirm that the cluster resources were recovered to the point in time when the backup occurred. If you have been performing regular scheduled backups, this will recover the cluster database to a point in time shortly before the loss of Node_B.
 9. Using the Cluster Administrator on Node_A, monitor the cluster "joining" status of Node_B.
 10. Using the Cluster Administrator on Node_B, verify that the cluster group can be moved between the nodes by right-clicking the group and selecting **Move group**.

For cluster service on a domain controller

This recovery is for a VSS backup created before the NetWorker VSS Client was installed. This backup would include VSS SYSTEM BOOT, VSS SYSTEM FILESET, and VSS SYSTEM SERVICE.

The following procedure describes how to recover a single node in a two node cluster. The procedure assumes that you are recovering Node_B and that Node_A is available.

1. Using the Cluster Administrator on Node_A, evict Node_B from the cluster.
2. At the command prompt, type the following to clean up MSCS:

```
cluster node Node_B /forcecleanup
```



CAUTION

After cleaning up the Cluster Server, you must reproduce the preexisting application environment on Node_B so MSCS can administer the applications as it did before the node failed. One way to reproduce the preexisting application environment is to perform a recovery for each application that was previously installed on the node.

3. Using the Cluster Administrator, select **Join an existing Cluster** and type the cluster name.
4. Using the Cluster Administrator on Node_A, ensure that Node_B appears available for failover operations.
5. Stop the cluster service in Node_A by using one of the following methods:
 - Using the control panel service tool, stop the Cluster service.

- At the command prompt, type the following:
`net stop clussvc`
6. Select the required items to be recovered for Node_B.
 - a. Boot the NetWorker VSS client in directory service restore mode as described in “Booting Windows in Directory Service Restore mode” in the *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide*.
 - b. Open the NetWorker VSS client software.
 - c. From the **Options** menu, select **System Recover Configuration Options** and click the **NetWorker** tab.
 - d. Clear the **Use Microsoft best practices for selecting the system state** attribute and click **Yes** when asked to confirm your selection.
 - e. Click **OK** to close the dialog box.
 - f. From the left pane, select **Recover > System Recover Session**.
 - g. Stop the cluster service in Node_B by using one of the following methods:
 - Using the control panel service tool, stop the Cluster service.
 - At the command prompt, type the following:
`net stop clussvc`
 - h. Select all local drives *except* for the NetWorker VSS client installation directory.
 - i. Select **VSS SYSTEM SERVICES**, **VSS SYSTEM FILESET**, and **VSS SYSTEM BOOT**.
 - j. From the **System Recover Session** toolbar, click **Start Restore**.
When prompted, restart node_B.
 7. Start the Cluster service on node_A by using one of the following methods:
 - Using the control panel service tool, start the Cluster service.
 - At the command prompt, type the following:
`net start clussvc`
 8. Using the Cluster Administrator on Node_A, confirm that the cluster resources were recovered to the point in time when the backup occurred. If you have been performing regular scheduled backups, this will recover the cluster database to a point in time shortly before the loss of Node_B.
 9. Using the Cluster Administrator on Node_A, monitor the cluster "joining" status of Node_B.
 10. Using the Cluster Administrator on Node_B, verify that the cluster group can be moved between the nodes by right-clicking the group and selecting **Move group**.

Performing a disaster recovery of a clustered client from a legacy non-VSS backup

This recover is for a non-VSS backup created before the NetWorker VSS Client was installed. This backup would include SYSTEM STATE, SYSTEM DB, and SYSTEM FILES.

Recovery of non-VSS backups of the cluster database, using the NetWorker VSS Client, does not work.

To ensure that backups of the cluster database are available for recovery, perform a full backup of the system right after updating the system to NetWorker VSS Client. This creates a post-installation cluster backup that can be recovered using the NetWorker VSS Client.

Reset to default values message for Active Directory or PIT plug-in is not printed at the end of recovery (LGTsc05970)

In file system restore, when the Recover option is set to a value other than the default, after the restore the value is reset to the default value and a message is printed at the end: "The options specified in the Recover Options Dialog have been reset back to their safe default values."

However, in an Active Directory or PIT restore, even though the value is reset to the default value, there is no message printed at the end of the restore indicating that the value has been reset to the default value.

Workaround After the restore is complete, open the **Recover Options** dialog box to check the values for Active Directory or PIT.

NetWorker for Windows VSS Client fails to load GUI if a server not configured for VSS client is added (LGTsc06157)

When specifying servers for recovery in the NetWorker VSS client, if a server is added that is not configured for the VSS client, the NetWorker GUI will not load. An error message is displayed, titled "Attempted to read or write protected memory. This is often an indication that other memory is corrupt."

Workaround Exit NetWorker for Windows VSS Client. Verify that the server name has been specified correctly, and that the server's NetWorker Management Console has been configured to recognize the client system. Then perform the recovery.

Cannot use port-based firewall settings for NetWorker VSS Client (LGTsc04925)

If you use port-based firewall exclusions, there are additional firewall configuration requirements to allow use of the NetWorker VSS Client. NetWorker VSS Client does not support port-based exclusions.

Note: Hardware providers and third-party firewalls may have separate port configuration requirements. Check their respective documentation for their requirements.

NetWorker VSS Client supports firewall configuration through the Windows Server 2003 SP1 Security Configuration wizard, and through manual configuration of the Windows firewall. Through the Security Configuration wizard or manual configuration, you can specify port exclusions based on process name.

Workaround **For Replication Manager Service Ports:**
Add the Replication Manager control and data ports to the firewall port configuration. These ports are configured during NetWorker VSS Client installation, and can be found in the registry after installation.

For the PowerSnap Service Port:

Add the PowerSnap Service (nsrpsd) to the firewall port configuration. The nsrpsd process should allocate ports from the reserved port range configured for the host. To find the actual port in use by nsrpsd, use the **rpcinfo -p** command.

For PowerSnap Agent Services Ports:

PowerSnap runs three agent services during backup and recovery processes. Each of these agent processes uses their own ports. The port used is nondeterministic, and is not allocated from the reserved port range.

The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Installation Guide* provides more information about using the Security Configuration wizard, extending the wizard, and manually configuring exceptions for the Windows firewall. The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide* provides more information about specifying ranges for service and connection ports.

ASR-based recovery for NetWorker VSS Client-created ASR backups is not supported (LGTsc07007)

ASR-based recovery is not supported for NetWorker VSS Client-created backups. ASR recoveries do work for ASR media created from backups using previous versions of NetWorker prior to the installation of NetWorker VSS Client.

When ASR recovery fails, an error message similar to the following may be displayed:

```
The recovery application "C:\WINDOWS\system32 \asr_pfu.exe
/restore /sifpath=C:\WINDOWS\repair\asr.sif" returned an
error code 0x1. Since this indicates an unrecoverable error,
ASR cannot continue on this machine.
```

Workaround

Use the legacy NetWorker disaster recovery method. Follow the non-ASR recovery method described in the *EMC NetWorker (Release 7.3.2 or 7.4) Multiplatform Version Disaster Recovery Guide*. In the task for recovering the NetWorker client or storage node data, when selecting all the appropriate save sets for recovery select the following save sets:

- All local drives (except the NetWorker installation directory)
- SYSTEM COMPONENTS (except for ASR DISK)
- APPLICATIONS (if applicable)

Note: If you use the legacy disaster recovery method, you may be unable to log in to the host using a domain account. In this case, rejoin the local host to the domain. Refer to Microsoft documentation for information about rejoining a host to a domain.

Active Directory version dialog box does not show items backed up from NetWorker VSS Client 1.0 (LGTsc06465)

Due to a change in the value used for the Active Directory application family number by NetWorker VSS Client, the Active Directory Version dialog box may not show items backed up from NetWorker VSS Client 1.0.

Workaround Although NetWorker VSS Client 1.0.1 correctly browses versions backed up with 1.0, it is unable to display items backed up from NetWorker VSS Client 1.0 in the NetWorker Versions dialog box. To recover items backed up with 1.0 after upgrading to 1.0.1 and performing Active Directory Backups, use the change browse time feature to set the browse time to a time prior to the upgrade.

AD recover GUI fails to reanimate the contact object from tombstone database (LGTsc07137)

This issue occurs when an Organizational Unit (OU) has been created with user objects along with contact objects. When deleting the OU and restoring the OU using the NetWorker VSS Client Active Directory, the recover GUI will fail to reanimate the contact object from the tombstone database. However, the user object and any other objects inside the OU will reanimate, and the reanimation of contact objects which were created under the Domain (apart from OU) will also succeed.

Technical notes

There are no technical notes for this release.

Documentation

Related documents include:

- ◆ *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide*
- ◆ *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Installation Guide*
- ◆ *EMC NetWorker Administration Guide*
- ◆ *EMC NetWorker Installation Guide*
- ◆ *EMC NetWorker Release Notes*
- ◆ *EMC Software Compatibility Guide*
- ◆ *EMC License Manager Installation and Administration Guide*
- ◆ *EMC Symmetrix Solution Enabler Quick Reference Guide*

Note: For updated disaster recovery information, consult the *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Administration Guide*.

Software media, organization, and files

Information on software media, organization, and files is provided in the *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Installation Guide*.

Installation

The *EMC NetWorker VSS Client for Microsoft Windows Server 2003 First Edition Installation Guide* contains details on installation of the NetWorker VSS Client.

Note: Before performing a NetWorker VSS Client software upgrade, remove all existing snapshots. Also, ensure that PowerSnap snapshot entries are deleted before upgrading. Delete Powersnap entries using the PowerSnap Client SnapManager or **nsrnapadmin**.

Troubleshooting and getting help

EMC support, product, and licensing information can be obtained as follows.

Product information — For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Powerlink™ website (registration required) at:

<http://Powerlink.EMC.com>

Technical support — For technical support, go to EMC Customer Service on Powerlink. To open a service request through Powerlink, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

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