



Using Firestreamer-RM with Microsoft Backup (NTBackup)

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Cristalink Limited

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1. Introduction

Firestreamer-RM is software that allows the Microsoft Backup Utility (NTBackup) to access a wide range of non-tape storage media, making possible long-term and off-site retention of data without the need for tape drives. Firestreamer-RM can use HDD, Blu-ray, DVD, Iomega REV, network file systems and other types of media as underlying storage, exposing the pieces of media as virtual tape to the Microsoft Backup Utility.

More information

- Firestreamer-RM Home Page – <http://www.firestreamer.com/fsrm/>
- Firestreamer-RM Overview – <http://www.firestreamer.com/fsrm/hh.aspx?id=overview>

Features

Main Features

- ✓ Native backup of Microsoft Windows file systems and components with the Microsoft Backup Utility.
- ✓ Native backup of Microsoft SQL Server databases with the SQL Server Backup.
- ✓ Native backup of Microsoft Exchange Server with the Microsoft Backup Utility.
- ✓ Support for Microsoft Windows Small Business Server 2003 Backup Configuration Wizard.
- ✓ Easy scheduled backups with email notifications and flexible media management.
- ✓ Full integration with the Removable Storage service.
- ✓ Full integration with the Microsoft Windows Automated System Recovery (ASR).
- ✓ Built-in data compression and encryption.
- ✓ Support for media spanning (when a backup takes more than one piece of media).
- ✓ Support for drive spanning (automatic switching between multiple media drives).
- ✓ Support for the media drives without drive letters.

Features for Scheduled Backups

- ✓ Automatic preparation of blank and unrecognized media.
- ✓ Ability to append to previous backups.
- ✓ Write protection for unexpired backups.
- ✓ Ability to select the types of storage media on a per task basis.
- ✓ Support for media and drive spanning.
- ✓ Support for scheduled ASR backups.
- ✓ SMTP email notifications with log file attachments.
- ✓ Custom prologue and epilogue scripts to support multi-step backup scenarios.
- ✓ Customizable parser for the Microsoft Backup Utility's log files.
- ✓ Scheduled tasks status report.
- ✓ Detailed Firestreamer-RM log file.

Advantages over BKF Files

- ✓ Simplified media management. No more hassles with file names and drive letters.
- ✓ Easy scheduled backups with email notifications.
- ✓ Data compression and encryption.
- ✓ Media and drive spanning.
- ✓ Faster backups with less CPU usage to optical and lomega REV media.

Supported Software

- ✓ Microsoft Backup Utility (NTBackup).
- ✓ Microsoft SQL Server 6.5, 7.0, 2000 and 2005.
- ✓ Microsoft Exchange Server (indirectly supported via NTBackup).
- ✓ Microsoft Windows 2000 SP4 or newer (both Workstation and Server).
- ✓ Microsoft Windows XP (all 32 and 64 bit editions).
- ✓ Microsoft Windows Server 2003 (all 32 and 64 bit editions, including R2).
- ✓ Microsoft Small Business Server 2000 and 2003 (all 32 and 64 bit editions, including R2).

Supported Media

- ✓ Hard disk drives (HDD).
- ✓ Blu-ray (BD-RW, BD-R, BD-RW DL, BD-R DL).
- ✓ HD DVD (experimental support for HD DVD-RAM and HD DVD-R).
- ✓ DVD (DVD-RAM, DVD+RW, DVD+R, DVD+R DL). Note that DVD-R/RW is not supported.
- ✓ lomega REV (both 35 and 70 GB).
- ✓ Flash memory, including pen drives, CompactFlash and SecureDigital.
- ✓ Files on any file system supported by Microsoft Windows, including network shares, NAS and WebDAV.
- ✓ Any other storage media recognized by Microsoft Windows as direct-access media.

Supported Media Drives

- ✓ USB.
- ✓ SCSI and iSCSI.
- ✓ IEEE-1394 (FireWire).
- ✓ ATA (IDE, EIDE), ATAPI, SATA, SATAPI and eSATA.
- ✓ Any other storage media drives recognized by Microsoft Windows as fixed or removable drives, including internal and external drives, mobile racks and external enclosures.

2. Using Firestreamer-RM

Firestreamer-RM is a virtual tape drive that consists of the tape driver and control panel. The Firestreamer-RM Tape Driver is the main component that does all the job. It is automatically loaded when your system starts up. The Firestreamer-RM Control Panel allows you to configure the tape driver and is not required to be running during a backup or restore.

The actual backup and restore operations are performed by the Microsoft Backup Utility. Being a mere tape drive, Firestreamer-RM is not aware of what is recorded on its virtual tape.

When enabled, Firestreamer-RM periodically queries all compatible media drives connected to the computer. Once Firestreamer-RM finds a medium in one of the drives, it connects to that drive and exposes the medium as a virtual tape cartridge to the Microsoft Backup Utility. When disabled, Firestreamer-RM does not interfere with any of the media drives.

Firestreamer-RM stays connected to the media drive until disabled or the current medium is ejected. When Firestreamer-RM disconnects from a media drive because of the ejected medium, it starts querying all the media drives again, and connects to the next available drive with a compatible medium inside. At any given time, Firestreamer-RM can be connected to, at most, a single media drive.

Note the following:

- A piece of media in the media drive appears to the Microsoft Backup Utility as a tape cartridge.
- Firestreamer-RM attempts to connect to the media drives in an unspecified order. For example, if you have two media drives with media inside, Firestreamer-RM will randomly connect to one of them.
- You can enable and disable Firestreamer-RM via the **Backup** tab of the Firestreamer-RM Control Panel. For your convenience, Firestreamer-RM by default automatically enables or disables itself when the Microsoft Backup Utility starts or stops.
- For interactive backups, Firestreamer-RM uses only the types of media selected on the **Settings** tab of the Firestreamer-RM Control Panel. For scheduled backups, the Firestreamer-RM Wrapper allows you to select the types of media on a per task basis.

More information

- Getting Started – <http://www.firestreamer.com/fsrm/hh.aspx?id=start>
- Firestreamer-RM Control Panel – <http://www.firestreamer.com/fsrm/hh.aspx?id=fcp>
- Automated System Recovery – <http://www.firestreamer.com/fsrm/hh.aspx?id=asr>
- Frequently Asked Questions – <http://www.firestreamer.com/fsrm/hh.aspx?id=faq>
- Firestreamer-RM Messages – <http://www.firestreamer.com/fsrm/hh.aspx?id=messages>
- Troubleshooting – <http://www.firestreamer.com/fsrm/hh.aspx?id=tshoot>

Performing an Interactive Backup and Restore

To perform an interactive backup or restore with the Microsoft Backup Utility to or from the Firestreamer-RM virtual tape drive, follow the same procedures as you would with a physical stand-alone tape drive. To overcome some of the Microsoft Backup Utility's known limitations, we recommend opening the Microsoft Backup Utility by using one of the following methods:

- Open the Firestreamer-RM Control Panel, click the **Backup** tab, and then click **Open Backup Utility**.
- Click **Start**, point to **Programs**, point to **Firestreamer-RM**, and then click **Open Backup Utility**.

Note the following:

- You need to select **IBM 3480**, as opposed to **File**, as the backup type.
- You do not need to specify the drive letter of your media drive because Firestreamer-RM automatically connects to the first available drive with a compatible medium inside. To avoid confusion, make sure there is only one drive with a medium inside during an interactive backup or restore operation.
- From the Microsoft Backup Utility's point of view, a piece of Firestreamer-RM media (for example, a USB external HDD) is tape.
- Before responding to the Microsoft Backup Utility's messages prompting for media, wait for up to one minute. The messages automatically disappear once the current medium is recognized, provided the drive contains the required piece of media.

To Perform an Interactive Backup

1. Open the Microsoft Backup Utility.
2. Configure the backup options as needed. Select **IBM 3480** (not **File**) as the backup type.
3. Start the backup operation.

To Perform an Interactive Restore

1. Open the Microsoft Backup Utility.
2. Configure the restore options as needed. Note that Firestreamer-RM media are listed under **IBM 3480**, not under **File**.
3. Start the restore operation.

More information

- The Backup Utility – <http://www.firestreamer.com/fsrm/hh.aspx?id=ntbackup>
- How to Back Up – <http://www.firestreamer.com/fsrm/hh.aspx?id=backup>
- How to Restore – <http://www.firestreamer.com/fsrm/hh.aspx?id=restore>
- Tips and Tricks – <http://www.firestreamer.com/fsrm/hh.aspx?id=tips>

Inserting Media

To insert a medium into the Firestreamer-RM virtual tape drive, use the appropriate method below:

- If the medium is removable (for example, DVD or Iomega REV), insert the medium into the media drive according to the manufacturer's instructions.
- If the medium is fixed, but the media drive is removable (for example, a USB external HDD), connect the drive to your computer.
- If you use file media, type the file name in the **File name** box on the **Media** tab of the Firestreamer-RM Control Panel, and then click **Apply**.

Ejecting Media

Before ejecting the medium, make sure that the Microsoft Backup Utility has finished accessing the Firestreamer-RM Tape Drive. You may not be able to eject the medium while a tape operation is in progress because the medium will be locked in the media drive by the Microsoft Backup Utility.

To eject the current medium from the Firestreamer-RM virtual tape drive, use the appropriate method below:

- If the medium is removable (for example, DVD or Iomega REV), press the eject button on your media drive and remove the medium.
- If the medium is fixed, but the media drive is removable (for example, a USB external HDD), perform the standard safe removal procedure and then disconnect the drive from your computer.
- If you use file media, clear the **File name** box on the **Media** tab of the Firestreamer-RM Control Panel, and then click **Apply**.

3. Scheduled Backups

It's in the scheduling of backup tasks where Firestreamer-RM really shines. If you ever used an unattended backup with the Microsoft Backup Utility, you will be surprised how easy it can be. The Firestreamer-RM Wrapper is a utility which automatically prepares the media, starts up the Microsoft Backup Utility and monitors its performance. Once the Microsoft Backup Utility finishes, the Firestreamer-RM Wrapper parses its log file to ensure the backup task succeeded, and notifies you of the results in an email. Firestreamer-RM also provides you with a detailed summary report that displays the status of recent backup tasks, along with handy links to log files.

The flexible media management policy allows overwriting or appending to a particular piece of media, depending on the medium's age and amount of free space available. In addition, the Firestreamer-RM Wrapper supports user-defined scripts at the beginning and the end of a scheduled backup. For example, in a multi-step backup scenario, the prologue script can be used to save a database residing on a Microsoft SQL Server to a file. The Microsoft Backup Utility then backs up the saved database along with your other data to Firestreamer-RM's file media – a compressed and encrypted file. Finally, the epilogue script can upload the resulting file to offsite online storage via FTP or another communication protocol.

More information

- Scheduled Backups – <http://www.firestreamer.com/fsrm/hh.aspx?id=schedule>

Scheduling a Backup with the Firestreamer-RM Wrapper

To schedule a backup with the Firestreamer-RM Wrapper, follow the steps below:

1. Open the Microsoft Backup Utility.
2. Select the items to back up.
3. Select **IBM 3480** as the backup type and **New** as the media you want to use.
4. On the **Completing the Backup or Restore Wizard** page, click **Advanced**.
5. Specify the advanced options as required. Leave **Backup label** and **Media label** as is (these labels will not be used).
6. Specify **Job name** (for example, *Test Backup*) and set **Schedule** as required.
7. Complete the Wizard by clicking **Finish**.
8. Open the Firestreamer-RM Control Panel.
9. Click the **Schedule** tab.
10. Double-click the name of the newly created backup task (*Test Backup*).
11. On the **Firestreamer-RM Wrapper** tab, click **Add Wrapper**.
12. Follow the wizard pages to specify the task settings as required. You can press **F1** on your keyboard at any time to get immediate help. See also the backup examples below.
13. Complete the Wizard by clicking **Finish**.
14. Click **Open Scheduled Tasks**.
15. Right-click the name of the task (*Test Backup*), and then click **Run** to test the task.

Note the following:

- A scheduled Firestreamer-RM Wrapper task takes at least five minutes to complete. Please be patient.
- You do not need to manually prepare media or insert file media for scheduled backup tasks. The Firestreamer-RM Wrapper will do it for you.
- You can have no more than one scheduled backup task running at any given time.
- Do not respond to the Microsoft Backup Utility's messages prompting for media during a scheduled backup because this may cause the task to fail. Normally, the messages automatically disappear within a few minutes.
- If you schedule a backup to run under a non-administrative account, you need to set appropriate permissions on Firestreamer-RM and removable storage objects. For more information, see <http://www.firestreamer.com/fsrm/hh.aspx?id=schedule#account>.

4. HDD and Flash Memory

Firestreamer-RM supports all storage devices recognized by Microsoft Windows as fixed or removable direct-access media, such as external and internal hard disk drives, flash memory and so on. As a safety precaution, Firestreamer-RM only connects to a media drive when either the latter contains the medium that has been used with Firestreamer-RM before or when the following conditions are met:

- The medium contains a single partition; and
- The partition is formatted with the file system supported by Microsoft Windows, such as FAT or NTFS (the actual type of the file system is not important); and
- The root directory does not contain any files or folders, including hidden or system ones, with the exception of *RECYCLER*, *RECYCLED*, *\$Recycle.Bin* and *System Volume Information*. The root directory may contain other hidden files or folders only if it also contains a file or folder called *FirestreamerWriteAllowed*.

If any of the above conditions is not met, the **Activity** tab of the Firestreamer-RM Control Panel will indicate that the medium is not prepared.

More information

- HDD and Flash Memory – <http://www.firestreamer.com/fsrm/hh.aspx?id=hdd>

Preparing Media

To prepare direct-access media for first use with Firestreamer-RM, follow the steps below:

1. Disable Firestreamer-RM via the **Backup** tab of the Firestreamer-RM Control Panel.
2. Open the Windows Disk Management.
3. Delete all partitions on the target disk. **WARNING:** This will destroy all data on the medium.
64-bit systems: You can use the **DiskPart** system utility to delete special partitions, such as EFI.
4. On the right lower pane, right-click the disk icon (not the partition space), and then click **Convert to Basic Disk**, if available.
5. Right-click the disk icon again, and then click **Convert to MBR Disk**, if available.
6. Create a new **Primary** partition on the disk and assign a drive letter.
7. Format the partition with FAT, FAT32 or NTFS. The type of the file system is not important because Firestreamer-RM will re-format the medium. You may want to use the **Quick Format** option to speed up the formatting process.
8. Open the newly formatted drive in Windows Explorer and create a new folder on it called *FirestreamerWriteAllowed*. The presence of this folder will allow Firestreamer-RM to use the drive even if the latter contains hidden files or folders.
9. You can leave the drive letter assigned to the disk, however, we recommend removing the drive letter because this will reduce the chances of other software interfering with the drive.
10. If the medium is removable, eject and reinsert it. Otherwise, if the drive is removable, perform the safe removal operation and then reconnect the drive. If the drive is fixed, restart your computer.
11. Enable Firestreamer-RM.

Firestreamer-RM will connect to the media drive.

5. BD, HD DVD and DVD

If you use Firestreamer-RM with optical media, consider the following:

- You do not need to format optical media before using it with Firestreamer-RM.
- Initialization of a blank optical medium may take up to a few minutes at the beginning and the end of a backup.
- If you have not used Firestreamer-RM before, try rewritable media first. If something goes wrong, you will not be able to reuse \pm R write-once media.
- Recorded BD-R, HD DVD-R and DVD \pm R write-once media must be finalized to be compatible with read-only (ROM) drives. However, you do not need to finalize media if you plan to use it only with a writer drive.
- You can only append to \pm R write-once media; you cannot overwrite previous backups.
- Rewritable DVD+RW media can sustain only a limited number of writes. To avoid data corruption, discard DVD+RW media after several overwrite cycles. Consider using DVD-RAM, BD or HD DVD instead, which are much more reliable.
- We recommend that you enable data verification in your backup software when performing backups to DVD+RW.
- Firestreamer-RM does not support writing to DVD-R/RW. Please use DVD+R/RW or DVD-RAM instead.
- Do not be confused by the RW logo on DVD+R media, as this type of media is not rewritable.
- Make sure the speed rating of the media matches the speed of your drive.
- Always use high-quality branded media.

More information

- BD, HD DVD and DVD – <http://www.firestreamer.com/fsrm/hh.aspx?id=dvd>

6. Iomega REV

Iomega REV disks are recognized by Firestreamer-RM as *Removable media (MMC)*. You do not need to format Iomega REV media before using it with Firestreamer-RM.

To improve the performance and stability of your system, we strongly recommend uninstalling all Iomega REV drivers because some older versions of these drivers are known to cause system lock-ups and crashes. You can, however, leave the Iomega REV software installed if you are not experiencing any problems with Firestreamer-RM. We also recommend disabling unused Removable Storage libraries, including the Iomega REV one.

Note that the Iomega REV drives do not support hardware compression. You may not be able to store, for example, 90 MB of data on a 35 MB disk, as may be advertised in the Iomega REV documentation, because the actual compression ratio depends on the type of the data being backed up.

More information

- Iomega REV – <http://www.firestreamer.com/fsrm/hh.aspx?id=rev>

7. File Media

Firestreamer-RM can use files (called *file media*) as underlying storage for the virtual tape drive. File media are similar to the Microsoft Backup Utility's BKF files and can reside on local and network file systems, such as FAT, NTFS, NAS, WebDAV and so on. Like physical media, file media support data compression and encryption.

To handle file media, Firestreamer-RM maintains a virtual file media drive, which is always present and behaves like a physical media drive. You can control the file media drive via the **Media** tab of the Firestreamer-RM Control Panel. When you insert or eject a file medium, Firestreamer-RM opens or closes the corresponding file, respectively. While the file is open, it is unavailable to other applications. For example, to make a copy of an inserted file medium, you will need to eject it first.

If you plan to use Firestreamer-RM file media, consider the following:

- File media are primarily intended for use by scheduled backups with network-based file systems, such as network shares, NAS, WebDAV and others. We do not recommend using file media with physical removable media or removable drives for performance and convenience reasons.
- By default, file media have the .fsrm extension.
- File media do not support media spanning. The entire backup must fit in a single file.
- The maximum size of a file medium is 8 terabytes and is subject to the limitations of the underlying file system.
- A scheduled Firestreamer-RM Wrapper task can use only a new file medium and cannot append to an existing .fsrm file.
- We recommend using the same name for both the virtual tape medium and the underlying .fsrm file (you specify the medium name when configuring a backup in the Microsoft Backup Utility or in the Firestreamer-RM Wrapper).
- When a file medium is inserted, the corresponding file is opened with the credentials of the user who performed the operation. If you insert a file medium that resides on a network share, you need to make sure that you have sufficient privileges to access the share.
- Firestreamer-RM does not re-insert the last inserted file medium after the system restart because it cannot preserve the security context of the user who originally inserted the file medium.
- You can burn a .fsrm file to an optical medium (for example, a BD or DVD disc) as an ISO image and then use the resulting optical medium with Firestreamer-RM.

More information

- File Media – <http://www.firestreamer.com/fsrm/hh.aspx?id=file>

8. Data Encryption

Firestreamer-RM can encrypt your sensitive data with the strong FIPS-197 Advanced Encryption Standard (AES) algorithm, which is recommended for use by U.S. Government organizations and sufficient to protect classified information up to the Top Secret level.

When the data encryption is enabled, Firestreamer-RM encrypts every piece of media with a unique encryption key derived from a user password. All backups on the same medium are encrypted with the same encryption key; you cannot have different passwords for different backups on the same medium. The encryption status of the current medium is displayed on the **Media** tab of the Firestreamer-RM Control Panel.

The encryption password is applied to a medium when the medium is written for the first time or overwritten from the beginning. If the current password does not match the medium password, you will not be able to access the data on the medium or append new data to it. To apply a new password to the current medium, move the medium to the Free Media pool in Removable Storage.

More information

- Data Encryption – <http://www.firestreamer.com/fsrm/hh.aspx?id=aes>

Using Encryption

To enable Firestreamer-RM data encryption, follow the steps below:

1. Open the Firestreamer-RM Control Panel.
2. Click the **Settings** tab.
3. Select the encryption **Algorithm**. Currently, the only supported algorithm is **FIPS-197 (AES) CTR 256bit**.
4. Click **Set** to set the password.
5. Type your password in the **New password** and **Confirm new password** boxes, and then click **OK**. To delete the current password from computer memory, leave the password boxes empty.
6. If you want Firestreamer-RM to remember your password between system restarts (this may be useful for scheduled backups), select the **Remember password** box.
7. Click **Apply**.
8. Insert a new medium or reinsert the current one.

9. Microsoft Small Business Server Backup

If you plan to use the Microsoft Windows Small Business Server 2003 Backup Configuration Wizard (SBS Backup) with Firestreamer-RM, consider the following:

- You need to select tape as the backup destination when configuring the SBS Backup for use with Firestreamer-RM. For more information, refer to the Microsoft SBS 2003 documentation.
- The SBS Backup is merely a front end for the Microsoft Backup Utility with a very limited set of options. To perform a backup, the SBS Backup runs the Microsoft Backup Utility configured to unconditionally overwrite the first available media.
- The SBS Backup does not allow selecting between different tape drives, which may be a problem if you also use a physical tape drive.
- The SBS Backup does not support media spanning.
- In some cases, because of its inherent limitations, the SBS Backup may not work properly with Firestreamer-RM. To perform a backup, the SBS Backup starts up the Removable Storage service, which in turn queries the Firestreamer-RM virtual tape drive. While it may take up to ten seconds for Removable Storage to recognize the current medium, the SBS Backup may time out in just a few seconds, producing the "Unable to detect tape drive or tape media" (or similar) error message.
- It is hard to troubleshoot SBS Backup failures due to the obscure error reporting.

To overcome the above limitations, we strongly recommend using the Microsoft Backup Utility with the Firestreamer-RM Wrapper instead of the SBS Backup.

More information

- Microsoft Small Business Server Backup – <http://www.cristalink.com/fsrm/hh.aspx?id=sbs>
- Scheduled Backups – <http://www.cristalink.com/fsrm/hh.aspx?id=schedule>

Converting a SBS Backup task to the Firestreamer-RM Wrapper

To convert an existing SBS Backup task to the Firestreamer-RM Wrapper, follow the steps below.

1. Open the Microsoft Backup Utility and switch it to **Advanced Mode**.
2. Click the **Backup** tab, click **Job** on the top menu, and then click **Load Selections**.
3. Locate and open the SBS Backup selection script. Usually, it is **C:\Program Files\Microsoft Windows Small Business Server\Backup\Small Business Backup Script.bks**.
4. Click **Start Backup**, and then click **Schedule**.
5. Enter the job name, configure the schedule as needed, and then click **OK** to save the task.
6. Open the Firestreamer-RM Control Panel.
7. Click the **Schedule** tab, and then double-click the name of the task.
8. On the **Firestreamer-RM Wrapper** tab, click **Add Wrapper**.
9. Follow the wizard pages to specify the task settings as required. You can press **F1** on your keyboard at any time to get immediate help. See also the backup examples below.
10. Click **Finish** to complete the wizard.
11. Click **Open Scheduled Tasks**.
12. Right-click the name of the task, and then click **Run** to test the task.

10. Backup Examples

Daily Full and Hourly Incremental Backups to an External HDD

The procedure below allows you to have the backups of your server for the previous four weekdays on external hard disk drives at an offsite location, with each external HDD containing ten hourly incremental backups and a daily full backup.

Backup description

- The backups are scheduled Monday to Friday.
- The incremental backups are performed every hour from 9 am to 6 pm. The first backup at 9 am overwrites the medium; subsequent backups append to the medium.
- The full backup is performed at 3 am and appends to the medium.
- All the backups for each day fit on a single external HDD.
- The backup medium is changed manually at 8 am Monday to Friday.

Backup procedure

1. Label five external hard disk drives *Monday* through *Friday*.
2. Schedule the incremental backup with the Microsoft Backup Utility every hour from 9 am to 6 pm Monday to Friday (this can be achieved with a single task by using multiple schedules).
3. Convert the incremental backup task to the Firestreamer-RM Wrapper (see page 8) with the following settings: **Overwrite unrecognized media** – Yes, **Overwrite expired media** – Yes, **Maximum backup set age** – 5 days, **Append to media** – Yes, **Minimum free space** – 500 MB (or any other reasonable value), **Enable media spanning** – No, **Eject media when done** – No. The task will overwrite unrecognized or blank media, as well as the media written more than 5 days ago. The task will append backups to the media written less than 5 days ago.
4. Schedule the full backup with the Microsoft Backup Utility at 3 am Monday to Friday.
5. Convert the full backup task to the Firestreamer-RM Wrapper with the following settings: **Overwrite unrecognized media** – Yes, **Overwrite expired media** – Yes, **Maximum backup set age** – 5 days, **Append to media** – Yes, **Minimum free space** – 10,000 MB (or any other reasonable value), **Enable media spanning** – No, **Eject media when done** – Yes. The task will overwrite unrecognized or blank media, as well as the media written more than 5 days ago. The task will append backups to the media written less than 5 days ago. After the backup, the medium will be prepared for safe removal.
6. On Monday morning, before 9 am, connect the external HDD labeled *Monday* to the server.
7. On Tuesday morning, before 9 am, perform the standard safe removal procedure for the connected external HDD and then disconnect it from the server. Connect the external HDD labeled *Tuesday* to the server. Take the *Monday* external HDD to an offsite location.
8. Repeat step 7 every weekday, replacing the current HDD with the next appropriately labeled one.

You may want to clear the **Eject media when done** box for the full backup task. In this case, if you forget to change the medium in the morning, the backups will be appended to the current HDD until it gets full.

Daily Backups to DVD+RW with Media and Drive Spanning

The procedure below allows you to have full backups of your server for the previous six days at an offsite location by performing daily backups to seven pairs of DVD+RW discs.

Backup description

- The full backups are scheduled daily at 2 am.
- The daily full backup fits on two DVD+RW discs.
- The server has two DVD writers connected.
- The backup media are changed manually every morning.

Backup procedure

1. Label seven pairs of DVD+RW discs *Monday* through *Sunday*.
2. Schedule the daily full backup with the Microsoft Backup Utility at 2 am.
3. Convert the backup task to the Firestreamer-RM Wrapper (see page 8) with the following settings: **Overwrite unrecognized media** – Yes, **Overwrite expired media** – Yes, **Maximum backup set age** – 6 days, **Append to media** – No, **Enable media spanning** – Yes, **Eject media when done** – Yes, **Verify data** – No, **Prompt for additional media** – No. The task will overwrite unrecognized or blank media, as well as the media written more than 6 days ago. After the backup, the media will be ejected.
4. Every morning, remove the ejected media and load the next appropriately labeled pair of discs into the media drives. Take the recorded media to an offsite location.

Note the following:

- Do not use the **Verify data** option of the Microsoft Backup Utility for unattended backups with drive spanning, because it will not work as expected.
- It is impossible to predict which one of the two DVD writers will be used to create the first disc of the backup set.
- To avoid data corruption, replace the old media with a brand new set of DVD+RW discs every four weeks.

Daily Full Backups to Iomega REV

The procedure below allows you to have full backups of your server for the previous four weekdays at an offsite location by performing daily backups to five Iomega REV disks.

Backup description

- The full backups are scheduled Monday to Friday at 2 am.
- The daily full backup fits on a single Iomega REV disk.
- The backup medium is changed manually every morning.

Backup procedure

1. Label five Iomega REV disks *Monday* through *Friday*.
2. Schedule the full backup with the Microsoft Backup Utility at 2 am Monday to Friday.
3. Convert the full backup task to the Firestreamer-RM Wrapper with the following settings:
Overwrite unrecognized media – Yes, **Overwrite expired media** – Yes, **Maximum backup set age** – 5 days, **Append to media** – No, **Enable media spanning** – No, **Eject media when done** – Yes. The task will overwrite unrecognized or blank media, as well as the media written more than 5 days ago. After the backup, the medium will be ejected.
4. Every morning, remove the ejected medium and load the next Iomega REV disk into the drive. Take the recorded medium to an offsite location.

Backup with SQL Server to File Media then to FTP

The procedure below allows you performing daily backups of your database server to file media with subsequent uploading the file media to an offsite FTP server.

Backup description

- The full backups to file media are scheduled daily at 2 am.
- The prologue script backs up a database on a Microsoft SQL Server to a .bak file. The .bak file is then backed up by the main backup task.
- The epilogue script uploads the resulting file medium to an FTP server.

Backup procedure

1. Prepare the prologue and epilogue scripts. See the sample scripts at <http://www.firestreamer.com/fsrm/hh.aspx?id=sample-prolog> and <http://www.firestreamer.com/fsrm/hh.aspx?id=sample-epilog>.
2. Schedule the daily full backup with the Microsoft Backup Utility at 2 am. Include the .bak file (the database backup) into the backup selection.
3. Convert the backup task to the Firestreamer-RM Wrapper (see page 8) with the following settings: **Media Type** – File, **Prolog** and **Epilog** – specify the command lines for your scripts, **Destination Folder** – specify an appropriate destination folder for .fsrm files, **Delete expired *.fsrm files in the destination folder** – Yes, **Maximum file age** – 30 days. The task will create a new .fsrm file in the destination folder for every performed backup. All .fsrm files older than 30 days will be deleted from the destination folder.