External USB HDD Backups

Using BackupAssist™ with External USB Hard Drives

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CHAPTER 1
Introduction and Overview

For users without a tape drive, BackupAssist™ can perform backups to a backup file (with the .bkf extension). This backup file can be saved to a hard drive, DVD/CD, USB Memory Stick, **USB Hard Drive** or Network Storage Device, enabling users to perform their backups using BackupAssist when a tape drive is unavailable

With the advent of USB 2.0 and storage devices like external hard drives, a removable USB hard drive for backup is becoming more and more a prevalent option for backup software users, particularly when you consider the greater costs and lack of upgradeability and complex management and maintenance involved in utilizing a tape drive backup solution.

What is USB 2.0?

The new USB 2.0 standard provides higher bandwidth that is necessary for high-speed peripherals such as removable hard drives, high-speed scanners, CD and DVD drives. USB 2.0 delivers transfer rates of up to 480Mbits/sec, while conveniently maintaining backward compatibility with USB 1.1 devices.

The vast majority of new computers today come equipped with USB2 ports. If you are planning on using an external USB drive to perform backups you should ensure that you are using a USB2 port as the older standard, USB1, is significantly slower and not really an appropriate backup device. If your machine does not have a USB2 port, you can easily add one for a minimal cost, even on laptop computers.

USB 2.0 Support

Some Windows® servers do not support USB 2.0 and this is something that must be investigated before considering an external USB hard drive as a backup device:

The following was derived from: http://www.microsoft.com/whdc/system/bus/USB/USB2support.mspx

Software support for USB 2.0 for Windows®:

♦ For Windows® XP, support is provided in the Windows® XP Service Pack release.
♦ For Windows® 2000, support is provided in Windows® 2000 Service Pack 4.

♦ For Windows® Server 2003, support for USB 2.0 is built in.

Advantages / Disadvantages of External USB HDDs

Advantages

- **Portable —** Most External USB hard drives are compact enough to transport and store anywhere conveniently and can be taken off site to ensure protection against natural disasters like fires and floods.

- **Capacity —** Since the external USB enclosure can house any sort of 3.5inch Hard Disk Drive, the storage capacity is limited only by the size of hard drives that are currently available and the user's budget. Presently you can purchase 400GB hdds for about $US 270, making removable USB drives perfect for backing up large volumes of data.

- **Speed —** USB 2.0 support allows for a transfer rate of 480Mbits/sec which is significantly faster than most tape drives so backup and restore times are decreased.

- **Connectivity —** USB is a very common, standardized data transfer interface allowing you to connect your backup device to almost any computer, including laptops. You can also connect and disconnect USB hard drives without having to restart or configure anything – when the drive is connected it is automatically detected by the Operating System and ready for use.

- **Cost Effective –** Using an external USB drive as a backup device provides a very cost effective solution, particularly when compared with a similar capacity tape drive solution.

  For example: two external 250GB hard drives can be implemented for about $US 500, whereas an equivalent tape drive system with autoloader and two sets of media would cost in excess of $US 2500.

- **Easy to Manage –** Due to the large capacity of external USB drives, there is no need to manage you backup schedule as closely as you would have to with a tape backup solution in terms of having to perform manual insertion of additional tapes or implementing a costly tape library or autoloader.

- **Reliability —** Tapes in tape drive backup solutions can often be problematic and sometimes become corrupted. There is also the additional need for maintenance and tape drive cleaning which is not required with an external hard drive backup device.

CHAPTER 1
Introduction and Overview
continued

Advantages / Disadvantages of External USB HDDs - continued

<u>Disadvantages</u>

- **Speed** — External USB drives won't match the performance of an internal disk drive. While ATA drives today all support high speed DMA transfers, USB drives generally do not.

- **Size** — Compared with individual tapes, external USB drives are bulkier and perhaps more cumbersome and difficult to store off site.

- **Backup Software** – the majority of backup software is designed around rotation schedules that incorporate tape drive hardware. Restrictive tape backup strategies some software's employ which may treat your USB drives as tapes, forcing the purchase of additional unnecessary USB drives, which makes for an impractical and costly solution.

BackupAssist™, however, does not impose such restrictions and will integrate seamlessly with an external USB hard drive backup solution!

Drive	Data capacity	Transfer rate	Applications
Tape: Travan	10 - 20GB	2MB/sec	Home use, low range servers
Tape: DAT / DDS / 4mm	12 - 36GB	3.5MB/sec	Low range servers, small business
Tape: DLT	40GB	6MB/sec	Low to mid range servers
Tape: AIT	15 - 200GB	3MB/sec	Low to mid range servers
Tape: LTO 3	400GB	68-80MB/sec	Mid to high range servers and mainframes
HDD: External USB HDD	1 – 400GB	60MB/sec	Home use, small/medium business, low to mid range servers

Figure 1 — Backup Media Comparison

Who Should Use External USB HDDs for Backup?

External USB hard drives provide a very cost-effective and easy to manage backup solution that caters for a variety of data capacity requirements. As such, external USB hard drives provide a backup solution that is very appropriate for a broad range of small and medium businesses, as well as departments and workgroups that are subdivisions of larger enterprises. The following diagram

CD/DVD RW
CD:700MB
DVD-R/RW: 4.7GB
DVD-RAM DS: 9.4GB

Tape
(Travan, DDS, AIT)

IOMEGA REV DRIVE
(35GB Disks)

External USB Drive
(up to 400GB)

SNAP & NAS
(Variable Capacity)

Tape
(LTO, Autoloaders)

◄— **SMALL** —► ◄————————— **SMALL-MEDIUM** —————————► ◄— **LARGE** —►

highlights were external USB hard drives fit as a backup solution in an industry environment.

CHAPTER 1
Introduction and Overview
continued

Who Should Use External USB HDDs for Backup? - continued

Small to Medium Business involve data backup requirements that can range anywhere from 1GB of data to upwards of 300GB of data. In terms of price per gigabyte of storage capacity, an external hard drive backup solution offers businesses a much more sensible and cost effective solution for storing vital data in a secure offsite location when compared to that of expensive tape drive solutions.

Additionally, some businesses prefer not to use tapes as they require a very clean environment for storage and are susceptible to damage and corruption through contact with dirt and dust; backups can instead be stored on one or more external hard drives that are far less susceptible to a typical dusty environment and can be easily transported when necessary.

Utilizing an external USB drive also means that you can conduct restorations on any machine equipped with a USB connector, rather than having to go to the trouble of locating a machine with your particular tape drive to perform a restore on with your backup media.

Furthermore, if you already possess any unused hard disk drives you can simply purchase an external USB drive enclosure to house your existing drives, making this a perfect option for those on a restricted budget but still require a reliable backup strategy and solution.

CHAPTER 2
## BackupAssist Configuration Settings

The following pages provides instructions on how to use external USB hard drives with BackupAssist™ for implementation within your backup strategy!

CHAPTER 2
BackupAssist Configuration Settings

This chapter describes how to set up BackupAssist™ for use with external USB HDD and explains how each of the backup settings work are and how they integrate with a USB backup solution. For a list of popular industry-based **USB backup usage scenarios** please refer to **Chapter 3** of this document.

Setting up BackupAssist™ for use with External USB drives is a very straightforward and easy to manage process:
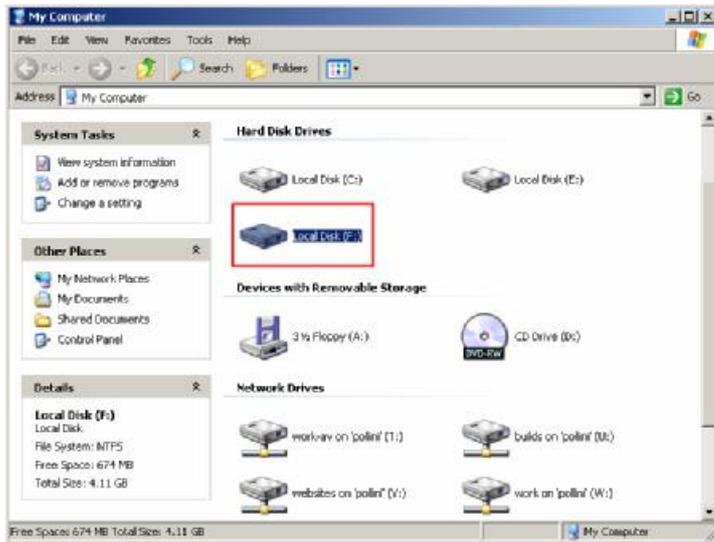
Step 1: Connect your External USB Hard Drive Device to your computer via the USB connector
Your drive should be automatically detected by Windows® and appear within Windows® Explorer simply as a new hard drive, assigned with a letter (*drive letter F: in the example above*).
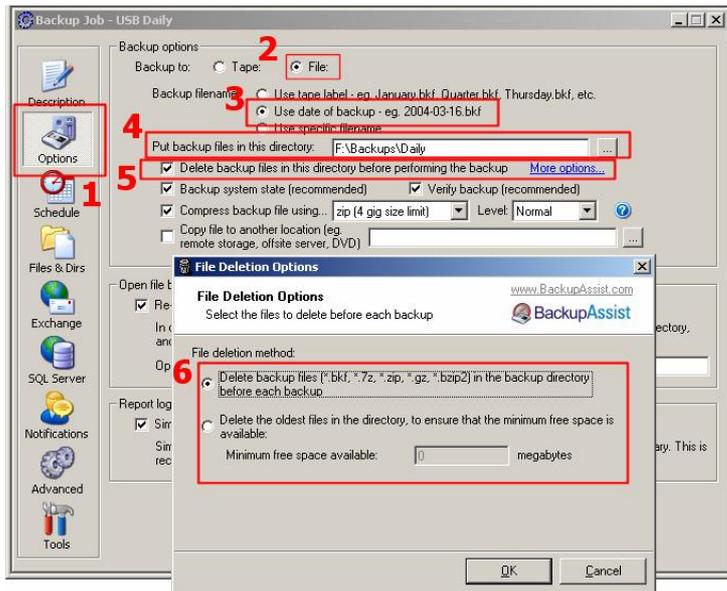
If your drive is not detected automatically you may need to install the appropriate drivers that should have been packaged with your external hard drive device. If drivers were not bundled with your hardware or if the drivers do not work within your system's environment, you should visit the manufacturer's website for an updated version of the driver.

Step 2: Within BackupAssist™

1. **Access the Options Tab**

2. **Select Backup to 'File' instead of 'Tape'**

3. **Select Backup File Naming Method**

- *Use Tape Label* — Your backup files will be named according to the tape labels defined in the schedule tab of BackupAssist (eg Monday.bkf, Tuesday.bkf, Wednesday.bkf, Thursday.bkf, Friday.bkf for the Basic [5 tapes] scheme).

- *Use Date of backup* — Your backup files will be named according to the date of backup (eg 2005-03-11.bkf).

- *Use specific file name* — You can directly specify the name of your backup file to a single label.

  Note: specifically naming your backup file will not give you the option of being able to delete backup files in the backup directory before backup, as the backup file will simply be overwritten each time a backup is performed due to it having the same name for each backup.

4. **'Put backup files in this directory'**

You can either manually input the path to your external USB drive or click the "…"button and select your intended location for the backup.

Note: In the example a path of 'Backups\Daily' has been chosen on the external USB drive for backup.

The following <u>delete option</u> is recommended for use with BackupAssist™ and external USB backup devices:

5. **Choose to Delete Previous Backups**

This option is recommended to those using an external USB drive for backup as it automates the process of ensuring that there is adequate drive space available to store your backup job each time, rather than you having to manually delete files from your backup device.

Additionally, this feature allows you to keep as many old backups on the external hard drive as are able to fit, meaning you have a more secure and larger archive of your most recent backups.

6. **Choose How Files are Deleted**

  <u>a) Delete backup files in the backup directory before each backup:</u>
  This will remove all backup files with the extensions listed from the backup directory.

  <u>b) Delete oldest backup files:</u>
  This option allows you to set the minimum amount of space that should be free on your backup device before the backup job commences. This option will also ensure that you have the latest backups on your drive as the oldest files are deleted first until the required space has been freed on the backup device.

7. **Other Options**

- *Backup System State* — whether to backup the registry and system state. Leave checked if you are backing up your entire system. Uncheck if you are just backing up data files.

CHAPTER 2
BackupAssist Configuration Settings
continued

7. Other Options — *continued*

- *Verify backup* — whether to verify the backup after completion to ensure the integrity of the data that was backed up.

- **Compress backup file**: BackupAssist™ allows you to compress your backup files using a free program known as 7-Zip (refer to the BackupAssist™ Help file for more information).

  Advantages
  ⇒ Fit more data onto your backup device

  Disadvantages
  ⇒ Your backup file must be uncompressed before you can perform a restoration
  ⇒ Your backup will take longer to run, because compression can be slow and is performed as an additional step once the backup has finished
  ⇒ You require temporary space on your backup device to perform the compression

  Recommended for
  ⇒ Situations where the size of your backup is important - for example, if you copy your backup file to a remote server via VPN or FTP, then compressing the file will reduce the transfer time.

- *Copy files to another location* — Should you require a secondary backup of your data you can choose to have your backup file copied across to another location after the initial backup completes. This is useful if you decide to compress your backup file as the file is compressed before being copied to the secondary device, thus saving you storage space.

  ⇒ *Example 1: you may want to firstly backup to a local hard drive, REV drive, network storage, etc and then have the backup copied across to your external USB drive.*

  ⇒ *Example 2: you could backup directly to your external USB drive and also place a copy of the backup on a local hard drive, network drive or a secondary external USB drive.*

  To **copy your backup job to another location** simply input the path of the secondary drive/location into the 'Copy File to another location' field in the Options tab.

- **Customizing email reminder messages**: It is also a good idea to customize the format of the reminder messages BackupAssist emails to your backup administrators, as by default they are designed for tape drive based solutions.

  To customize the reminder emails go to (following screenshot): **Navigator > Settings > Customize Emails**

  In the **reminder emails body field** you will notice the following is input by default:

  Please place the tape labeled %LABEL% in the tape drive

 A customized variant of this that reflects an external USB HDD:

  Please connect the external USB drive labeled %LABEL% to the backup machine.
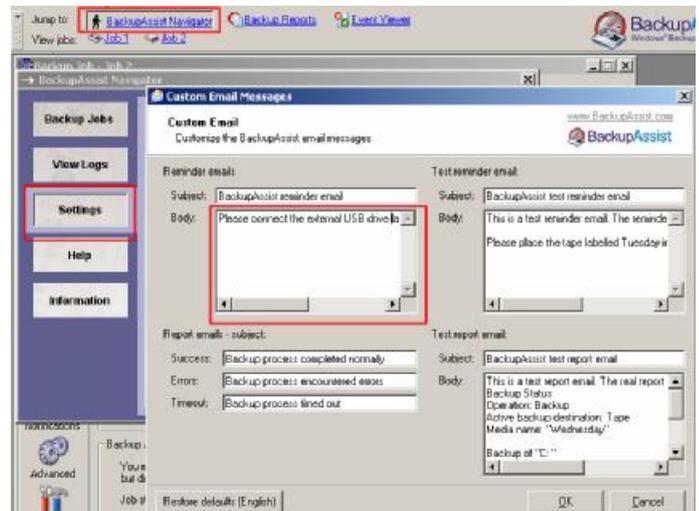
Once this customization has been completed you should also manually label each physical external USB hard drive, so users are aware of which drive to connect.

Step 3: Either perform a test backup or wait for a scheduled backup to occur

A backup job to the external USB drive was performed and as you can see in the screenshot below, the .bkf backup file has been written directly to the drive.
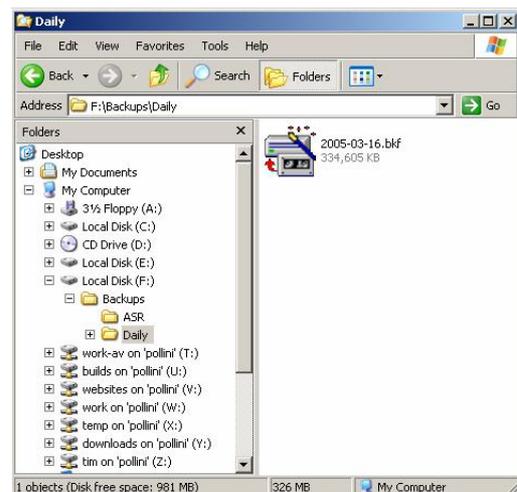
CHAPTER 3
Usage Scenarios

The following pages provide a series of backup strategy scenarios that involve the use of an external USB backup device, either as the primary backup device or as an integration into a current backup plan with other backup hardware. The example scenarios have been split into the following two categories:

- · **External USB HDD Strategies**
- · **Mixed Strategies: Tape Drive/External HDD/Local HDD/Network Storage**

Of course these examples are not a definitive list of backup strategies that involve an external USB backup device and instead provide a basic variety of some of the ways in which you can integrate an external USB hard drive into your backup plan.

Some of these scenarios involves setting up custom rotation schemes in BackupAssist and you may like to view our **Scheduling Custom Schemes White Paper** here:

- **HTML Version**: http://www.backupassist.com/education/cust_schemes.html
- **PDF Version**: http://backupassist.com/downloads/CustomSchemes.pdf

CHAPTER 3
Usage Scenarios
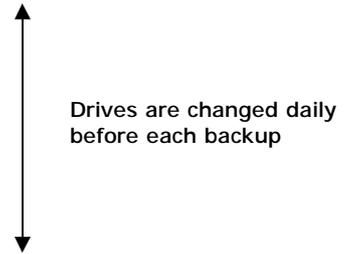### *External HDD Strategy: Example #1*

3 Removable HDDs

Drive 1 & 2 are alternated daily, Mon-Thu and a weekly backup is performed on Drive 3 on Friday.

- **Full backups:** Mon-Fri
- **Rotation Scheme:** Basic (5 days)
  - ⇒ Customize Tape Labels (see screenshot below)
    - ♦ Monday > Drive 1
    - ♦ Tuesday > Drive 2
    - ♦ Wednesday > Drive 1
    - ♦ Thursday > Drive 2
    - ♦ Friday > Drive 3 Weekly
- **File Naming Method:** Use Date of Backup
  - ⇒ **Drive 1:** 2005-04-11.bkf, 2005-04-13.bkf
  - ⇒ **Drive 2:** 2005-04-12.bkf, 2005-04-14.bkf,
    - ◊ As many backups as will fit on the drive are stored
    - ◊ Delete oldest backups files according to minimum free space
      For example: if Drive 1 and 2 each hold 4 backup files, you will have a history of 2 week's worth of backups.
 - ⇒ **Drive 3:** A full weekly backup is completed on Friday on this drive and stored offsite.

DRIVE 1 (Mon, Wed)
- Full backup on Monday and Wednesday
- Drive disconnected on Tuesday and Thursday

Drives are changed daily before each backup

DRIVE 2 (Tue, Thu)
- Full backup on Tuesday and Thursday
- Drive disconnected on Wednesday and Friday

DRIVE 3 (Fri)
- Full weekly backup on Friday
- Drive disconnected on Monday and stored offsite.
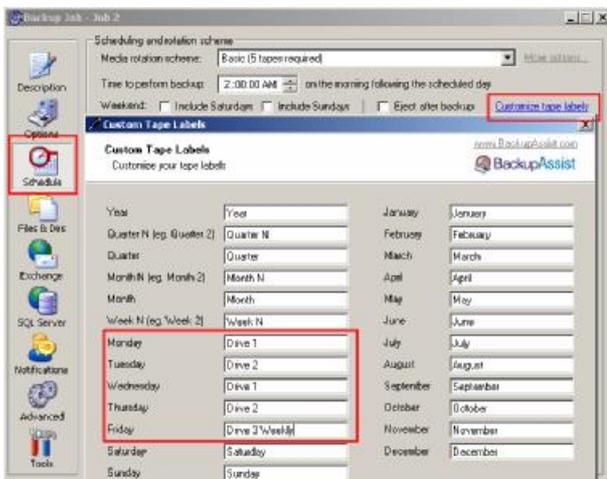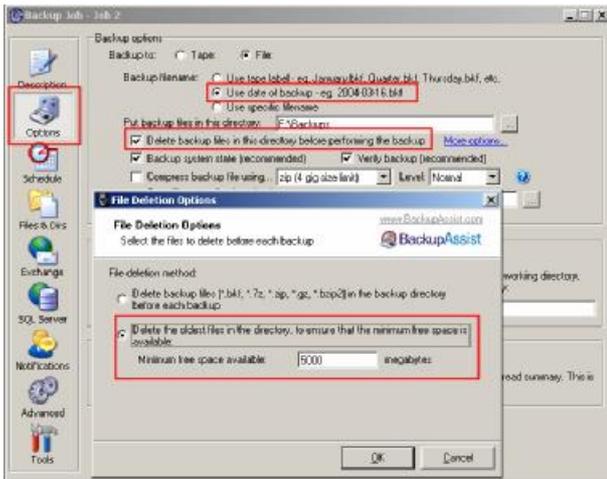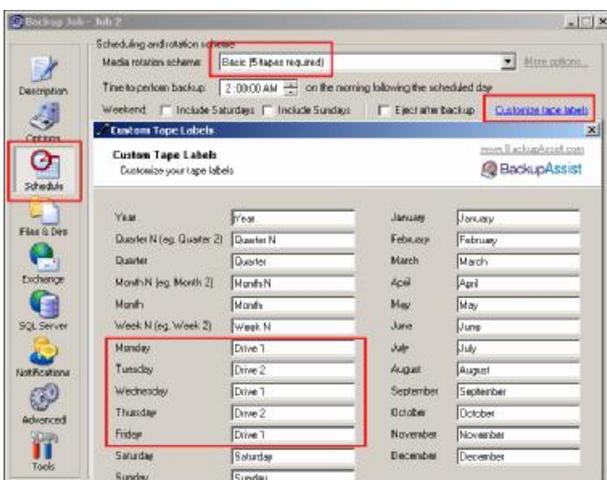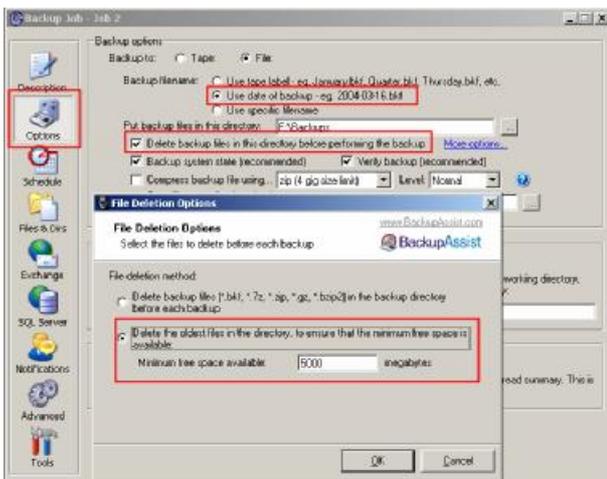
CHAPTER 3
Usage Scenarios
External HDD Strategy: Example #2

N Removable HDDs, changed daily

- **Full backups each day**
- **File Naming Method:** Use Date Of Backup
  - ⇒ N Drives are changed each day:
    - *For example (2 Drives):*
      - ♦ **Drive 1: 2005-02-05.bkf, 2005-02-07.bkf, 2005-02-09.bkf**
      - ♦ **Drive 2: 2005-02-06.bkf, 2005-02-08.bkf, 2005-02-10.bkf**
  - ⇒ As many backups as will fit on the drive are stored
  - ⇒ Delete oldest backups files according to minimum free space
- **Rotation Scheme:** Basic (5 days)
  - ⇒ Customize Tape Labels
    - *For example (3 Drives):*
      - ♦ Monday > Drive 1
      - ♦ Tuesday > Drive 2
      - ♦ Wednesday > Drive 3
      - ♦ Thursday > Drive 1
      - ♦ Friday > Drive 2
- **External drives can be stored offsite**

BackupAssist should be configured as follows:

DRIVE 1

- Full backups each time this drive is connected
- Drive can be stored offsite

Drives are changed daily before each backup

DRIVE N

- Full backups each time connected
- Drive can be stored offsite

CHAPTER 3
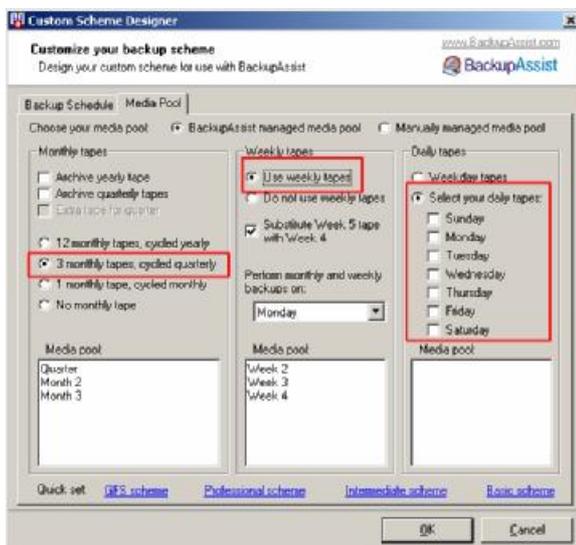## Usage Scenarios
External HDD Strategy: Example #3

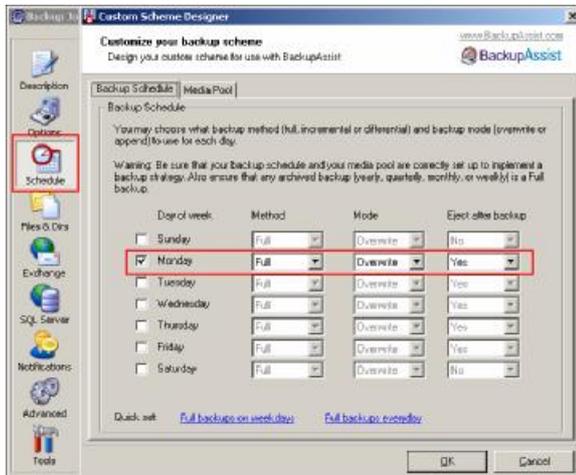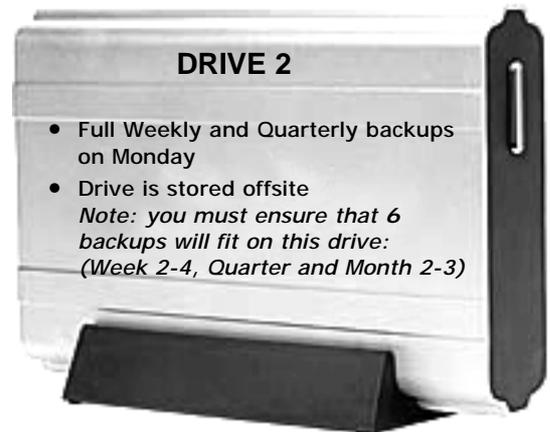**2 Removable HDDs, 2 separate backup jobs**

Drive 1: Backup Job 1
- **Full backups:** Tuesday
- **Incremental Backups:** Wed-Fri
- **Rotation Scheme:** Custom (5 days a week)
- **File Naming Method:** Use Date of Backup
  - ⇒ 2005-04-04.bkf, 2005-04-05.bkf, etc
  - ⇒ As many backups as will fit on the drive are stored
  - ⇒ Delete oldest backups files according to minimum free space

Drive 2: Backup Job 2
- **Full Weekly and Quarterly backups:** Monday
- **Rotation Scheme:** Custom (see below screenshots)
- **File Naming Method:** Use Tape Label
  - ⇒ Quarter.bkf, Month 2.bkf, Month 3.bkf, Week 2.bkf, Week 3.bkf, Week 4.bkf
  - ⇒ Ensure that 7 backups will fit on the drive
- **Drive is stored offsite**

DRIVE 1
- Full backup on Tuesday
- Incremental backups Wed-Fri

DRIVE 2
- Full Weekly and Quarterly backups on Monday
- Drive is stored offsite
  Note: you must ensure that 6 backups will fit on this drive: (Week 2-4, Quarter and Month 2-3)
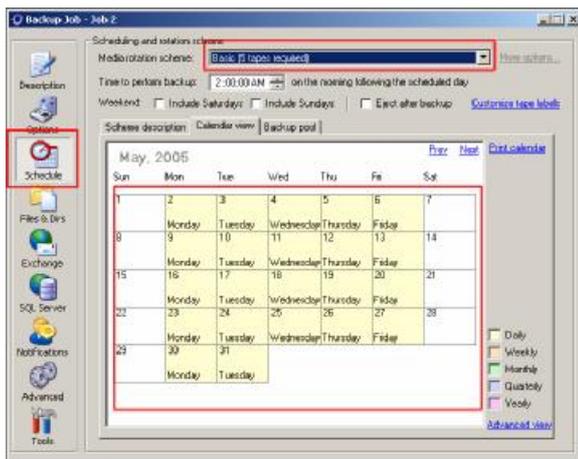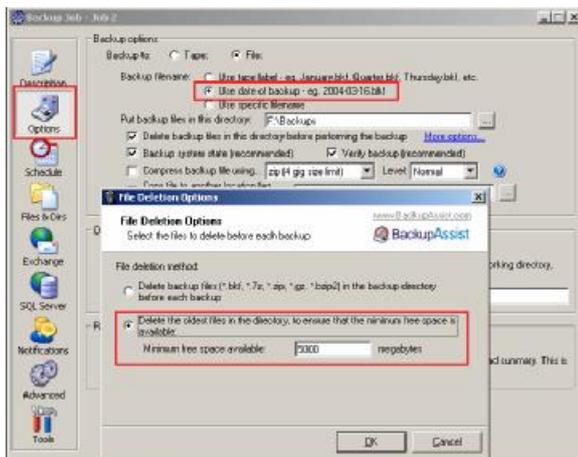
CHAPTER 3
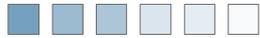## Usage Scenarios
External HDD Strategy: Example #4

5 Removable HDDs, changed daily

- **Full daily backups**
  - ⇒ External drives are changed each day
- **File Naming Method**: Use Date Of Backup
  - ⇒ As many backups as will fit on the drive are stored
  - ⇒ Delete oldest backups files according to minimum free space
- **Rotation Scheme**: Basic (5 days)

BackupAssist should be configured as follows:

MONDAY
- Drive connected Monday
- Full backup on Monday

TUESDAY
- Drive connected Tuesday
- Full backup on Tuesday

WEDNESDAY
- Drive connected Wednesday
- Full backup on Wednesday

THURSDAY
- Drive connected Thursday
- Full backup on Thursday

FRIDAY
- Drive connected Friday
- Full backup on Friday

CHAPTER 3
Usage Scenarios
Mixed Strategy: Example #1

Mixed strategies are useful for when your current system and data requirements outgrow your existing tape drive storage capacity. You can use your tape drive and tape media to backup your important and frequently changing data files and implement an external USB HDD to perform regular backups of your entire system including your system state (system settings, registry, user profiles, application settings, etc) to utilize in the case of a system crash or failure.

Tape Drive and N External HDDs

1. Backup your data (important data files only):
Tape Drive - 5 Tapes: Backup Job 1

- **Full data backups**: Monday-Fri
  - ⇒ Only files/folders backed up
  - ⇒ No System State backup
- **Rotation Scheme**: Basic (5 days a week)

2. Backup your entire system (data & system state)
External USB HDD: Backup Job 2
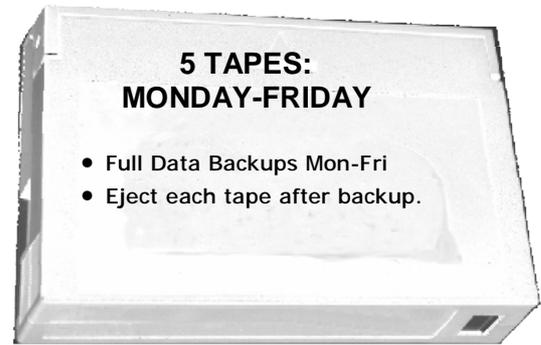
- **Full Weekly backups**: Monday
  - ⇒ System State and data included
- **Rotation Scheme**: Custom (see below screenshot)
- **File Naming Method**: Use Date of Backup
  - ⇒ 2005-04-11.bkf, 2005-04-18.bkf, 2005-04-25.bkf
  - ⇒ As many backups as will fit on the drive are stored
  - ⇒ Delete oldest backups files according to minimum free space
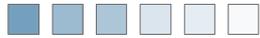- **N Drives can be changed weekly and stored offsite**
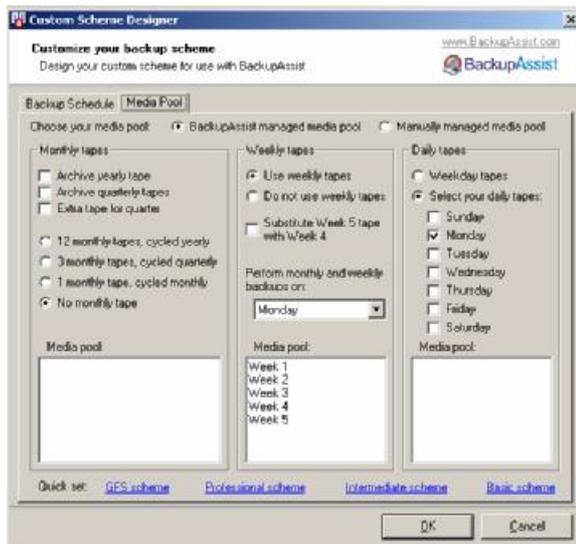
3. Optional — Prepare for Bare Metal Recovery:
External USB HDD: Manual Backup Job

- **Manual Automated System Recovery (ASR) Backup performed monthly**
- **ASR Backups** offer an automated process to ensure that you can quickly restore your entire system in the case of an emergency or system failure.
- For a detailed explanation and instructions on ASR refer to: **http://www.backupassist.com/downloads/BareMetalASR.pdf**

5 TAPES: MONDAY-FRIDAY

- Full Data Backups Mon-Fri
- Eject each tape after backup.

N EXTERNAL DRIVES

- Full Weekly backup on Monday
- System State and data backed up

OPTIONAL: ASR DRIVE

- Perform a manual ASR backup to this drive
- Drive is disconnected and stored offsite after backup

CHAPTER 3
Usage Scenarios
Mixed Strategy: Example #2

Tape Drive, External HDD, local/network HDD

1. Backup your data (important data files only):
Tape Drive - 5 Tapes: Backup Job 1
- **Full backups:** Monday
- **Incremental Backups:** Tues-Fri
- **Rotation Scheme:** Custom (5 days a week)

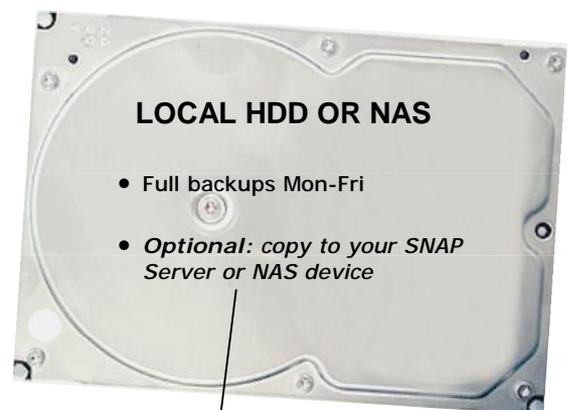## 2. Backup your entire system (data & system state)
External USB HDD: Backup Job 2
- **Full Weekly backups:** Friday
- **Rotation Scheme:** Custom (see below screenshot)
- **File Naming Method:** Use Tape Label
  - ⇒ Week 1.bkf, Week 2.bkf, Week 3.bkf, Week 4.bkf, Week 5.bkf, etc
  - ⇒ As many backups as will fit on the drive are stored
  - ⇒ Delete oldest backups files according to minimum free space
- **N Drives can be changed weekly and stored offsite**

3. Backup your data (redundant copy)
Local HDD or Network Attach Storage: Backup Job 3
- **Redundant copy of data in addition to tape**
- **Full backups:** Monday-Friday
- **Rotation Scheme:** Basic (5 days a week)
- **File Naming Method:** Use Tape Label
- **Optional:** Copy the backup job to a NAS device such as a SNAP server — simply enter the path of the SNAP sever into the **Copy file to another location** field as shown below:

**5 TAPES:
MONDAY-FRIDAY**

- Full backups Mon-Fri
- Eject each tape after backup.

N EXTERNAL DRIVES

- Full Weekly backup on Friday
- N Drives can be changed weekly and stored offsite

LOCAL HDD OR NAS

- Full backups Mon-Fri
- *Optional: copy to your SNAP Server or NAS device*

SNAP SERVER OR NAS DEVICE