

STORAGECRAFT™  
**SHADOWPROTECT 4**™

ShadowProtect™ ImageManager

User Guide



**STORAGECRAFT™**

*Leading the Way to Safer Computing*

# **User Guide** for **ShadowProtect™ ImageManager**

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## Chapter 1: About the User Guide

Welcome to the StorageCraft *ShadowProtect™ ImageManager User Guide*. This Guide describes the purpose of ImageManager, the ImageManager technology, and how to use it to manage your backup image file chains.

This Guide is divided into the following major sections:

- Chapter 2: ImageManager Overview<sup>[6]</sup>
- Chapter 3: Understanding the ImageManager UI<sup>[9]</sup>
- Chapter 4: Configuring ImageManager<sup>[14]</sup>
- Chapter 5: Verifying Backup Image Files<sup>[19]</sup>
- Chapter 6: Consolidating Backup Image Files<sup>[20]</sup>
- Chapter 7: Replicating Backup Image Files<sup>[22]</sup>
- Chapter 8: Using HeadStart Restore<sup>[25]</sup>
- Chapter 9: Browsing Backup Image Files<sup>[28]</sup>

Additionally, this Guide includes the following general information sections.

- Chapter 10: Product Support<sup>[29]</sup>
- Chapter 11: Glossary<sup>[30]</sup>
- Chapter 12: End User License Agreement<sup>[34]</sup>

### Additional Information

- For emerging issues and other resources, see the following:
  - The `readme.txt` file included with VirtualBoot product files.
  - The StorageCraft technical support Web site at [www.storagecraft.com/support.html](http://www.storagecraft.com/support.html)
- For more information about using ShadowProtect, see the StorageCraft *ShadowProtect User Guide*.
- For a glossary of ShadowProtect terms and definitions, see Chapter 11: Glossary<sup>[30]</sup>.

### Documentation Conventions



This symbol designates **Note** or **Warning** text that highlights critical information about the configuration and/or use of VirtualBoot.

## Chapter 2: ImageManager Overview

ShadowProtect ImageManager lets you manage Incremental backup images and the storage space consumed by your backup image files. Use ImageManager to create retention policies for managing the storage of backup image files. Under the guidelines defined by the retention policy, ImageManager automatically collapses Incremental backup image files into daily, weekly and monthly Incremental images. This lets you save disk space and reduce the size of the backup image file chains necessary to restore a system to a particular point-in-time.

ImageManager consists of the following components:

**ImageManager Service:** A service, run either locally or remotely, that performs the backup file management as defined by the retention policy.

**ImageManager Client:** The UI that lets you create and manage retention policies for your ShadowProtect environment.

This introductory section includes the following topics:

- [ImageManager Features](#) [6]
- [HeadStart Restore Scenarios](#) [7]
- [Installing ImageManager](#) [8]



**Note:** ShadowProtect leverages ImageManager retention policy only when using Continuous Incrementals backup schedule. Weekly and Monthly backup schedules do not use ImageManager. For more information, see "Creating Backup Image Files" in the *ShadowProtect User Guide*.

### 2.1 ImageManager Features

ImageManager provides the following basic features:

**Collapse:** Based on a policy that you define, ImageManager automatically consolidates Incremental backup image files. This limits the risk of having large backup image file chains where one bad file can render a whole backup image useless.

**Verify:** Based on a frequency that you define, ImageManager automatically verifies, and re-verifies, the integrity of your backup image files. The verification process is similar to that available manually by running the Verify Wizard in ShadowProtect.

**Replicate (Local):** Based on a profile that you define, ImageManager automatically creates copies of backup image files for redundancy. Smart replication that considers retention policy and other ShadowProtect settings to just replicate files that you need to save. ImageManager stores the files locally, but you can then transfer them to off-system or off-site storage, as needed.

Beyond these basic features, ImageManager offers the following premium features, available for an extra fee:

**Replicate (off-site):** Based on a profile that you define, ImageManager automatically creates copies of backup image files for redundancy. Smart replication that considers retention policy and other ShadowProtect settings to just replicate files that you need to save. Additionally, ImageManager automatically transfers the copies to external storage, using either direct LAN/WAN transmission or FTP.

**Head Start Restore:** Head Start Restore (HSR) is the ability to restore a backup image while

ShadowProtect continues to add Incremental backup images to the same backup image chain. In a world of multi-Terabyte storage HSR lets you short-circuit the restore process, greatly limiting the down-time associated with a hardware or software failure.

## 2.2 HeadStart Restore Scenarios

The concept of a HeadStart Restore (HSR) is extremely powerful, particularly for today's business environments where multi-Terabyte servers are becoming the norm. HSR lets you take advantage of your ShadowProtect backup images in ways that were previously not possible, as illustrated by the following usage scenarios.

### Virtual Server Migration

**Problem:** You need to migrate a database server with 20TB of data to a new Virtual Machine environment, but you cannot afford to have the server offline for three days it takes to migrate the data.

**ImageManager Solution:** Keep the old server running, and generating incremental backups, while you begin a HeadStart Restore of the same backup image chain into a Virtual Machine file (VMDK, ESX Server, VHD). Over time, the HSR catches up to the most current incremental from the database server, at which point you can take the old server down in off hours, apply the final incremental backup to the new server, and bring the new system on-line very quickly. You can even migrate the operating system volume by doing a Hardware Independent Restore (HIR) to make sure the migrated OS boots properly on the new server hardware.

### Hardware Failure

**Problem:** You have a database server and the 20TB disk array crashes. You need to get the system back on-line and replace the disk subsystem.

**ImageManager Solution:** Use ShadowProtect's VirtualBoot feature to boot the latest backup image of your database server and configure the VM to continue adding Incremental backups to your original backup image chain. Users can then continue to use the VM database server as if the original is still on-line.

Once the VM is running, start an HSR to the database server's new disk subsystem. Once HSR catches up to the most current incremental, you can finalize the HSR installation on the new disk subsystem, take the VM down, then bring the original database server back on-line. Using ImageManager with VirtualBoot reduces downtime from several days to only minutes.

### Virtual Standby Server

**Problem:** You want to have a stand-by server that can take over should your primary server fail, but you can't afford the high-priced server mirroring technology.

**ImageManager Solution:** Your production server generates continuous incremental backups. Configure an HSR solution to automatically restore those Incremental backup images into a Virtual Machine file (VMDK, ESX Server, or VHD). If your production server fails for any reason, finalize the HSR, then use the Recovery Environment to apply any remaining Incremental images to the Virtual Machine (a matter of minutes), then bring it on-line as a replacement for the failed production server.

## 2.3 Installing ImageManager

ShadowProtect includes the ImageManager software, but does not install it by default. Before installing ImageManager, make sure your system meets the following requirements:

- ImageManager requires Microsoft .NET version 2. The 32-bit ImageManager installer installs .NET automatically if it is not present. However, the 64-bit installer does not. You must install it manually before installing ImageManager.


### To install ImageManager

1. Launch the ImageManager installer (ImageManagerSetup.exe).

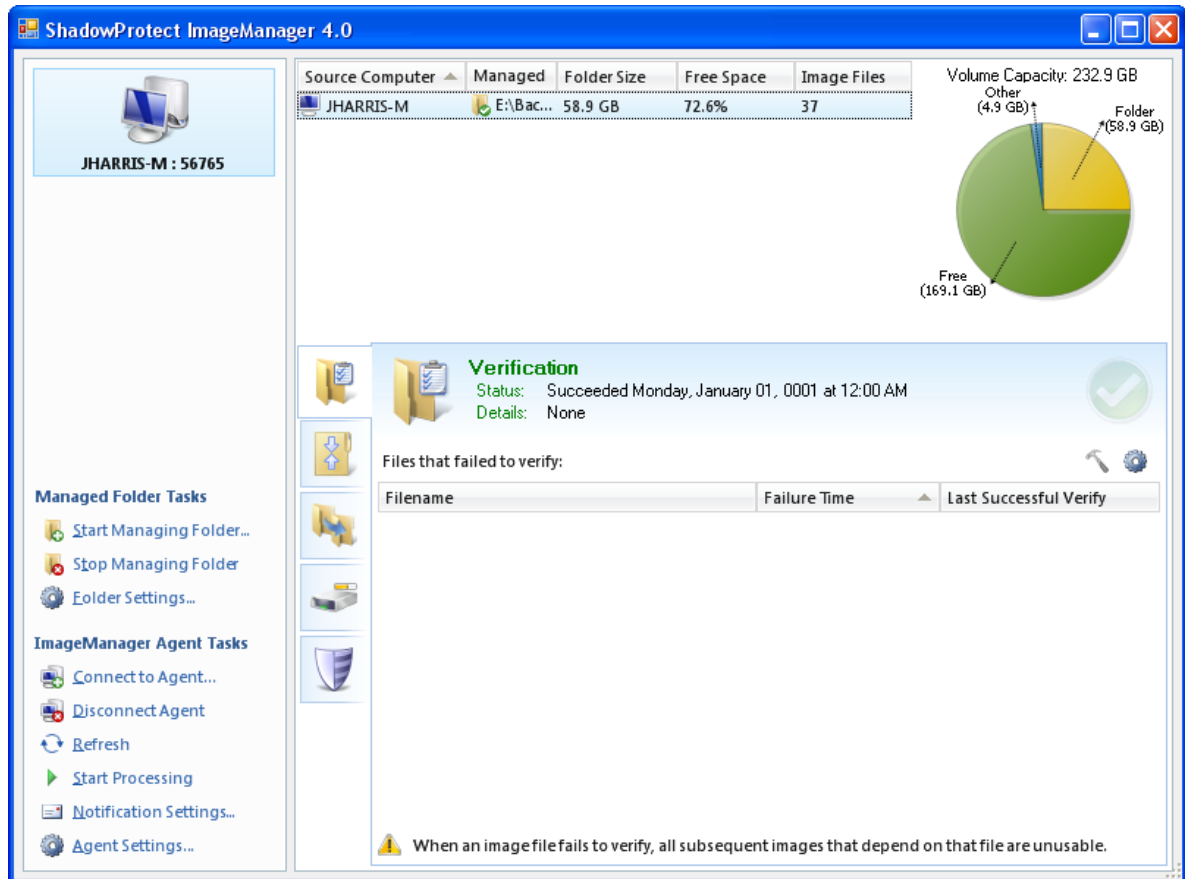
You can find the ImageManager installer in the following locations:

- **ShadowProtect Recovery CD:** \Installers\ImageManagerSetup.exe
  - **Online:** On the StorageCraft Trial Downloads page (<http://www.storagecraft.com/backup-support.php>).
2. Select the install language, then click **OK**.
  3. On the ImageManager Wizard Welcome page, click **Next**.
  4. Follow the steps in the Installation Wizard to install the ImageManager software.
  5. When the installation completes, click **Finish**.

You can launch ImageManager in Windows by selecting **Start > Programs > ShadowProtect > ShadowProtect ImageManager**.

 **Note:** The ImageManager agent loads automatically once ImageManager is installed. When it loads, it uses a configuration file (ImageManager.exe.config) to set the agent parameters. You can modify the configuration file to change the port that the ImageManager agent uses, if desired.

## Chapter 3: Understanding the ImageManager UI



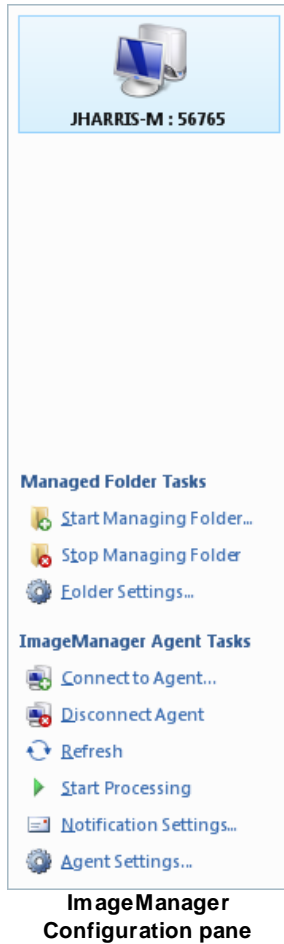
ImageManager User Interface

The ImageManager UI consists of the following components:

- Navigation Pane<sup>9</sup>
- Managed Folder Pane<sup>11</sup>
- Services Pane<sup>12</sup>

### 3.1 Configuration Pane






The left-side Configuration pane displays a list of currently connected ImageManager agents. Select an agent to have ImageManager display information from that agent in the ImageManager UI.



The Navigation pane also provides links to the following ImageManager features and functionality:

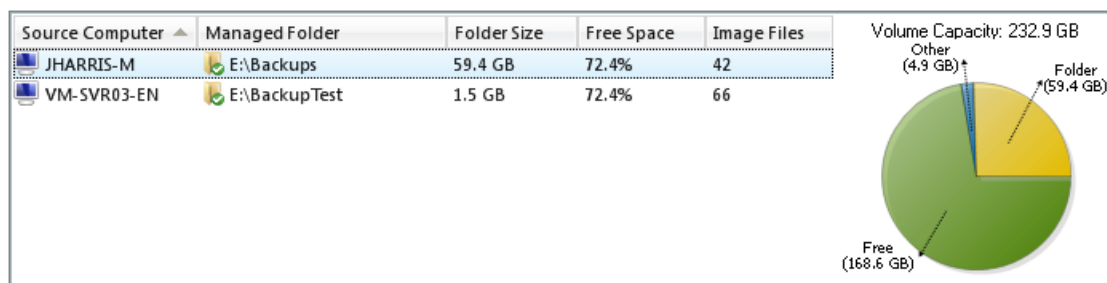
**Table 16: Navigation pane links**

Link	Description
<b>Managed Folder Tasks</b>	
<b>Start Managing Folder</b>	Opens the Managed Folder Settings dialog box, where you specify the storage locations for backup image files that you want ImageManager to manage.
<b>Stop Managing Folder</b>	Removes the currently selected managed folder (in the Managed Folder pane).
<b>Folder Settings</b>	Opens the Managed Folder Settings dialog box, where you can modify the settings for the currently selected managed folder.
<b>ImageManager Agent Tasks</b>	
<b>Connect to Agent</b>	Opens the Connect to ImageManager Agent dialog box so you can connect to a system's ImageManager agent.

Link	Description
 <b>Disconnect Agent</b>	Disconnects ImageManager Console from the currently connected ImageManager agent.
 <b>Refresh</b>	Instructs the ImageManager agent to re-query the system and update the data displayed in ImageManage Console.
 <b>Start Processing</b>	The ImageManager agent examines its verification and consolidation schedule, and starts any operations that are scheduled to run at this time.
 <b>Notification Settings</b>	Opens the Notification Settings dialog box, where you can configure the Email notification parameters for ImageManager events.
 <b>Agent Settings</b>	Opens the Agent Settings dialog box, where you can configure ImageManager agent behavior.

### 3.2 Managed Folder Pane

The top-center Managed Folder pane displays information about the managed folders associated with the currently connected ImageManager agent. Select a managed folder in the list to see a graphical representation of the folder usage. Selecting a managed folder also puts focus on it for operations in the Navigation and Services panes.



ImageManager Managed Folder pane

The Managed Folder pane provides the following information about each managed folder:

Table 17: Information in the Managed Folder pane










Link	Description
<b>Source Computer</b>	The computer name of the system where the backup image files in the managed folder were created.
<b>Managed Folder</b>	The path to the managed folder.
<b>Folder Size</b>	The size of the managed folder, in GB.
<b>Free Space</b>	The amount of free space available on the storage device where the managed folder resides. The Managed Folder pane also displays a graphical view of the storage










Link	Description
	space in the managed folder's volume.
<b>Image Files</b>	The number of backup image files contained in the managed folder.

### 3.3 Services Pane

The bottom-center Services pane provides access to ImageManager services. Each service has a separate tab that you can click to open the service-specific pane. Within each pane you can see information about the selected service, and perform tasks related to the service.

Table 16: ImageManager Services

UI Component	Description
 Verification	<p>Displays information about ImageManager's automated backup image verification service. From the Verification pane, you can also perform the following tasks:</p> <ul style="list-style-type: none"> <li> <b>Edit Verification Settings:</b> Opens the Verification Settings dialog box, where you can configure the automated verification service.</li> </ul> <p>For more information, see Chapter 5: Verifying Backup Image Files<sup>[19]</sup>.</p>
 Consolidation	<p>Displays information about ImageManager's automated image file consolidation service. From the Consolidation pane, you can also perform the following tasks:</p> <ul style="list-style-type: none"> <li> <b>Edit Consolidation Settings:</b> Opens the Consolidation Settings dialog box, where you can configure the automated verification service.</li> </ul> <p>For more information, see Chapter 6: Consolidating Backup Image Files<sup>[20]</sup>.</p>
 Replication	<p>Displays information about ImageManager's automated backup image replication service. From the Replication pane, you can also perform the following tasks:</p> <ul style="list-style-type: none"> <li> <b>Define New Replication Target:</b> Opens the Replication Target Settings dialog box, where you can configure a target location to use with the replication service.</li> <li> <b>Remove Selected Replication Target:</b> Deletes the currently selected replication target.</li> <li> <b>Edit Selected Replication Target:</b> Opens the Replication Target Settings dialog box, where you can modify the configuration of the currently selected target.</li> <li> <b>Enable Selected Replication Target:</b> Starts the replication service using the selected replication target to receive the replicated backup image files.</li> </ul>

UI Component	Description
	<p> <b>Disable Selected Replication Target:</b> Stops the replication service for the selected replication target.</p> <p>For more information, see Chapter 7: Replicating Backup Image Files<sup>[22]</sup></p>
 HeadStart Restore	<p>Displays information about ImageManager's HeadStart Restore service. From the Head Start Restore pane, you can also perform the following tasks:</p> <p> <b>Define New HeadStart Job:</b> Opens the HeadStart Job Settings dialog box, where you can configure a new HeadStart job.</p> <p> <b>Remove Selected HeadStart Job:</b> Deletes the selected HeadStart job.</p> <p> <b>Edit Selected HeadStart Job:</b> Opens the HeadStart Job Settings dialog box, where you can modify the currently selected HeadStart job.</p> <p> <b>Enable Selected HeadStart Job:</b> Starts the HSR service using the currently selected HeadStart job.</p> <p> <b>Disable Selected HeadStart Job:</b> Deletes the currently selected HeadStart job.</p> <p> <b>Finalize Targets in Selected HeadStart Job:</b> Opens the Finalize dialog box, where you can prepare the selected HSR target for use once the restoration process is complete.</p> <p>For more information, see Chapter 8: Using HeadStart Restore<sup>[25]</sup>.</p>
 Backup Images	<p>Displays information about the backup image files in the currently selected managed folder. The Backup Images pane displays a daily list of backup image files. You can browse to a particular day to see the backup image files created on that day.</p> <p>For more information, see Chapter 9: Browsing Backup Image Files<sup>[28]</sup>.</p>

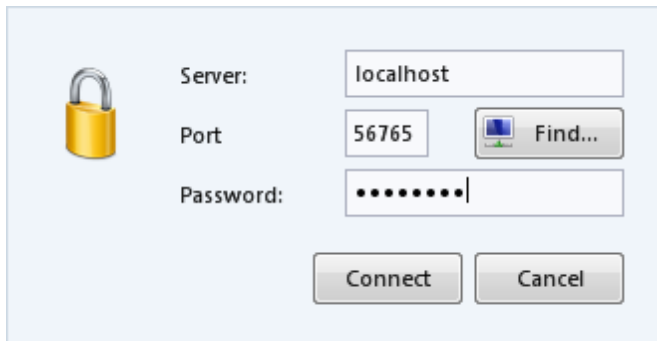
## Chapter 4: Configuring ImageManager

Before using any of the ImageManager services, you must do some basic configuration so that ImageManager console can access the system you want to manage. These configuration tasks follow a logical order:

- Connecting to an ImageManager Agent<sup>[14]</sup>
- Configuring the ImageManager Agent<sup>[15]</sup>
- Creating a Managed Folder<sup>[16]</sup>
- Configuring ImageManager Notifications<sup>[17]</sup>

### 4.1 Connecting to an ImageManager Agent

You must connect the ImageManager console to one or more ImageManager agents in order to manage backup image files.






#### To connect to an ImageManager agent

1. Launch the ImageManager console.

Upon startup, ImageManager displays a connect dialog box.

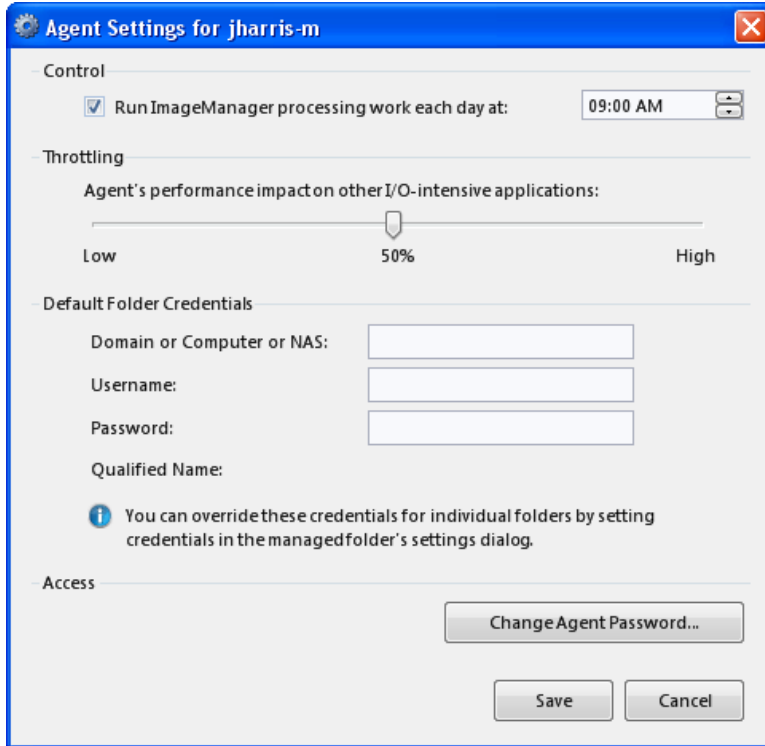
2. In the Connect dialog box, provide the required information, then click **Connect**.

<b>Server</b>	The name or IP address of the system running the ImageManager agent. You can use the keyword <code>localhost</code> to connect to an ImageManager agent running on the same system as the ImageManager console.  Click <b>Find</b>  to browse, by Computer Name, the network for a system you want to connect to.
<b>Port</b>	The TCP port used to communicate with the ImageManager agent. The default ImageManager agent port is 56765. You can change the port used by ImageManager agent in the <code>ImageManager\ImageManager.exe.config</code> file.   <b>Note:</b> You might have to modify your firewall settings to make the ImageManager agent port accessible.
<b>Password</b>	The password specified when loading the ImageManager agent you want to connect to.

You can connect to multiple ImageManager agents simultaneously. In the Configuration pane, click **Connect to Agent**  to open the Connect dialog box and connect to another ImageManager agent.

## 4.2 Configuring an ImageManager Agent

From the ImageManager console, you can modify the settings of any ImageManager agent that you are currently connected to.



### To modify ImageManager agent settings

1. Launch the ImageManager console.
2. In the Configuration pane, click **Agent Settings**.
3. In the Agent Settings dialog box, provide the required information, then click **Save**.

<b>Control</b>	(Default: Enabled at 12:00 AM) Lets you specify a time of day when the ImageManager agent performs its daily validation and consolidation operations.  Disabling this setting suspends the ImageManager agent's automated re-verification and consolidation services. However, you can manually start the ImageManager agent processing by clicking <b>Start Processing</b> in the Configuration pane (see Section 3.1: Navigation Panel <sup>94</sup> ).
<b>Throttling</b>	The amount of I/O bandwidth to apply to ImageManager agent operations.
<b>Default Folder Credentials</b>	The default authentication credentials used by the ImageManager agent to access managed folders. You can override these credentials for a

	specific managed folder, if necessary (see Creating a Managed Folder <a href="#">16</a> ).
<b>Change Agent Password</b>	Click <b>Change Agent Password</b> to update the password used to access the ImageManager agent.



**Note:** To modify the ImageManager agent port setting, edit the ImageManager configuration file: ImageManager\ImageManager.exe.config.

### 4.3 Creating a Managed Folder

You must connect the ImageManager console to one or more ImageManager agents in order to manage backup image files.

ImageManager Managed Folder Settings dialog box

#### To create a new managed folder

1. Launch the ImageManager console.
2. In the Configuration pane, click **Start Managing Folder**.
3. In the Managed Folder Settings dialog box, provide the required information, then click **Save**.

<b>Folder Path</b>	The path to the new managed folder. You can type, or browse to, the desired folder.
<b>Description</b>	(Optional) A description of the managed folder.
<b>Authentication</b>	(Conditional) The authentication credentials needed to access the managed folder. You can either use the default credentials specified in the ImageManager agent settings (see Configuring an ImageManager Agent <a href="#">15</a> ),

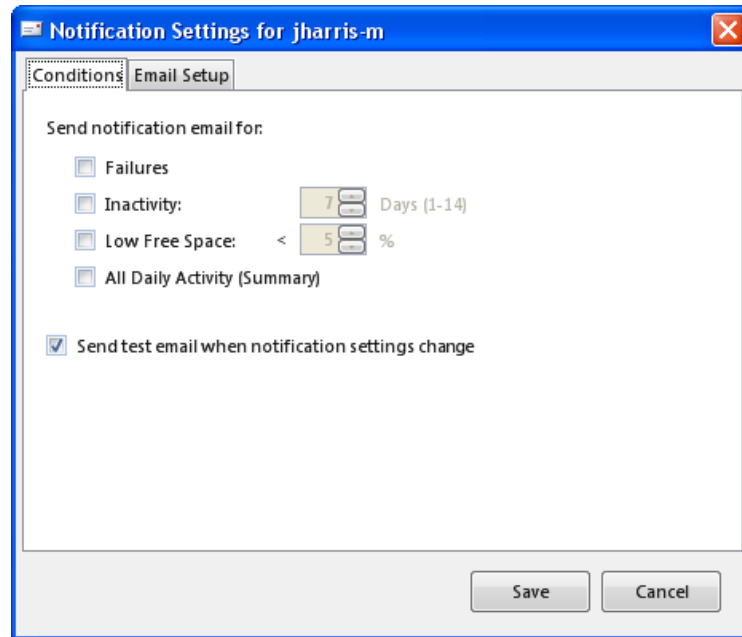
	or specify authentication credentials specific to this managed folder.
<b>Assign sort priority</b>	(Default: Disabled) When enabled, ImageManager sorts the managed folders in the Managed Folder pane by the specified sort value (0 - 255). ImageManager sorts its managed folders in ascending order.

#### 4.4 Configuring ImageManager Notifications

ImageManager can automatically send Email notifications when specific events occur.

##### To modify the notification settings

1. Launch the ImageManager console.
2. In the Configuration pane, click **Notification Settings**.
3. In the Notification Settings dialog box, select the **Conditions** tab, then select the events that you want to generate Email notifications.



ImageManager events that generate notifications

<b>Failures</b>	Send an Email when an ImageManager operation fails.
<b>Inactivity</b>	Send an Email when the ImageManager agent is inactive for the specified number of days.
<b>Low Free Space</b>	Send an Email when the space available in the managed folder drops below the specified threshold.
<b>All Daily Activity (Summary)</b>	Send a daily Email with a summary of the ImageManager operations.
<b>Send test email</b>	Sends an Email whenever the ImageManager notification settings change.

4. In the Notification Settings dialog box, select the **Email Setup** tab to configure the Email

account that you want to receive the Email notifications.

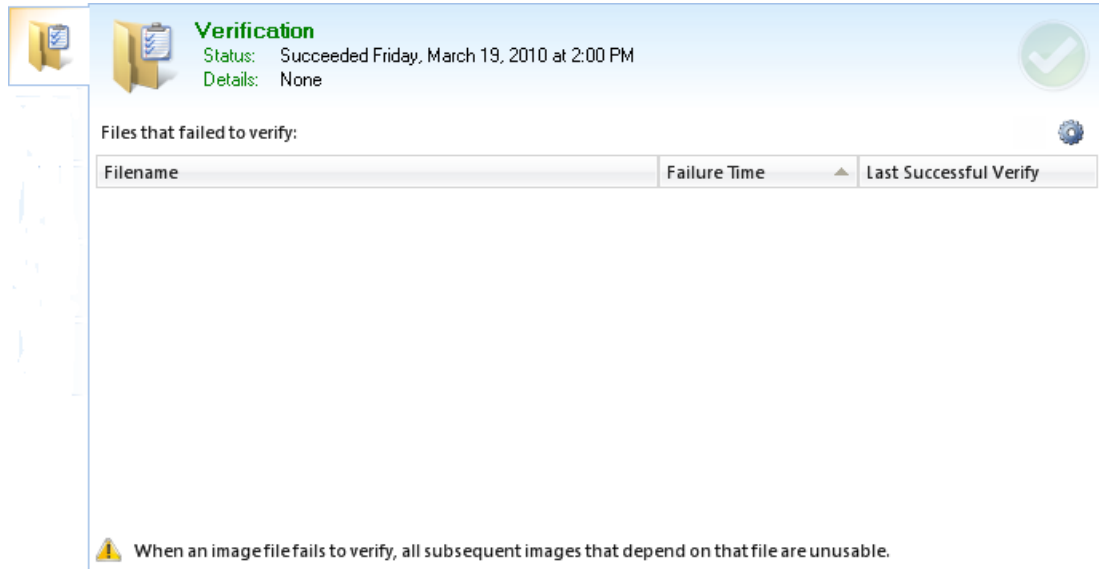
Email account configuration for ImageManager notifications

<b>SMTP Server</b>	The SMTP server name and port that ImageManager uses to send the Email notification. If necessary, provide valid authentication credentials for the SMTP server. Select <b>SSL</b> to send the Email via secure connection.
<b>Email Template</b>	The Email configuration. Provide the Email recipients and , if desired, a Sender name and Subject line for the notification emails.

5. Click **Save**.

## Chapter 5: Verifying Backup Image Files



The ImageManager verification service lets you periodically test the integrity of your backup image files. This verification of file integrity is similar to the manual process provided by ShadowProtect in the Verify Wizard (see "Verifying Backup Image Files" in the *ShadowProtect User Guide*). You can configure the verification service in the ImageManager Verification pane.



The ImageManager Verification pane

While The Verification service is enabled by default, you can configure specific verification behavior on a per-managed-folder basis.

### To configure the verification service

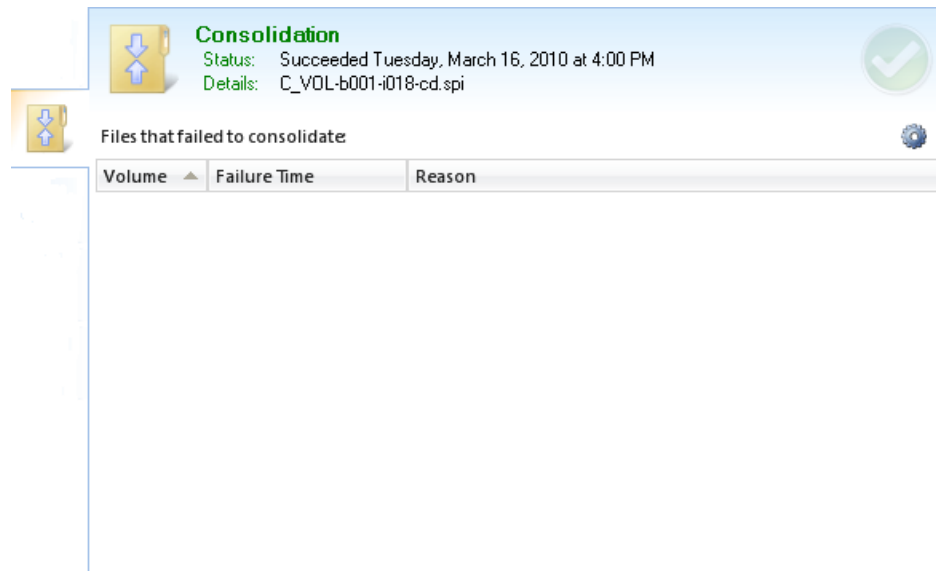
1. Launch the ImageManager console.
2. In the Managed Folder pane, select the managed folder you want to work with.
3. In the Services pane, select **Verification** .
4. In the Verification pane, select **Edit Verification Settings** .
5. In the Verification Settings dialog box, provide the desired information, then click **Save**.

<b>Immediately verify newly created image files</b>	(Default: Enabled) Instructs ImageManager to verify each backup image file immediately following its creation.
<b>Periodically re-verify existing image files</b>	(Default: Reverify every seven days) Instructs ImageManager to re-verify backup image files in the managed folder on a regular basis. You can re-verify the backup image files every 1 - 30 days, as specified in the <b>Days</b> field.
<b>Override default performance impact for image file verification</b>	(Default: Disabled) Lets you manage how the ImageManager agent uses processing resources during the verification process. More processing resources result in faster verification, but can impact other system operations.  By default, the agent uses no more than 50% of available processing resources for verification.

## Chapter 6: Consolidating Backup Image Files

The ImageManager consolidation service lets you periodically merge incremental backup image files into consolidated backup image files. Doing this lets you reduce the size of the file chain necessary to restore a system. Fewer files means fewer opportunities for file failure.

You can configure the verification service in the ImageManager Consolidation pane.





The ImageManager Consolidation pane

ImageManager provides the following consolidated file types:

- **Daily Consolidated Files:** At the end of each day, ImageManager can roll-up all Incremental backup image files created during that day into a single point-in-time Incremental image file that contains all updates made to the system that day. Daily consolidated files include a `-cd` in the file name. For example: `D_VOL-b001-i005-cd.spi`.
- **Weekly Consolidated Files:** At the end of each week, ImageManager can roll-up all Daily Consolidated files created during that week into a single point-in-time Incremental image file that contains all updates made to the system that week. Weekly consolidated files include a `-cw` in the file name. For example: `D_VOL-b001-i005-cw.spi`.
- **Monthly Consolidated Files:** At the end of each month, ImageManager can roll-up all Weekly Consolidated files created during that month into a single point-in-time Incremental image file that contains all updates made to the system that month. Monthly consolidated files include a `-cm` in the file name. For example: `D_VOL-b001-i005-cm.spi`.


### To configure the consolidation service

1. Launch the ImageManager console.
2. In the Managed Folder pane, select the managed folder you want to work with.
3. In the Services pane, select **Consolidation** .
4. In the Consolidation pane, click **Edit Consolidation Settings** .
5. In the Consolidation Settings dialog box, select the **Scheduling** tab, then specify the

appropriate settings.

<b>Enable image file consolidation</b>	(Default: Enabled) Enables the ImageManager consolidation service for the currently selected managed folder.
<b>Last day to include in consolidated Weekly images</b>	(Default: Saturday) Specifies the effective end of the week for the purpose of creating a Consolidated Weekly backup image file.
<b>Last day to include in consolidated Monthly images</b>	(Default: the 31st day of the month) Specifies the effective end of the month for the purpose of creating a Consolidated Monthly backup image file.

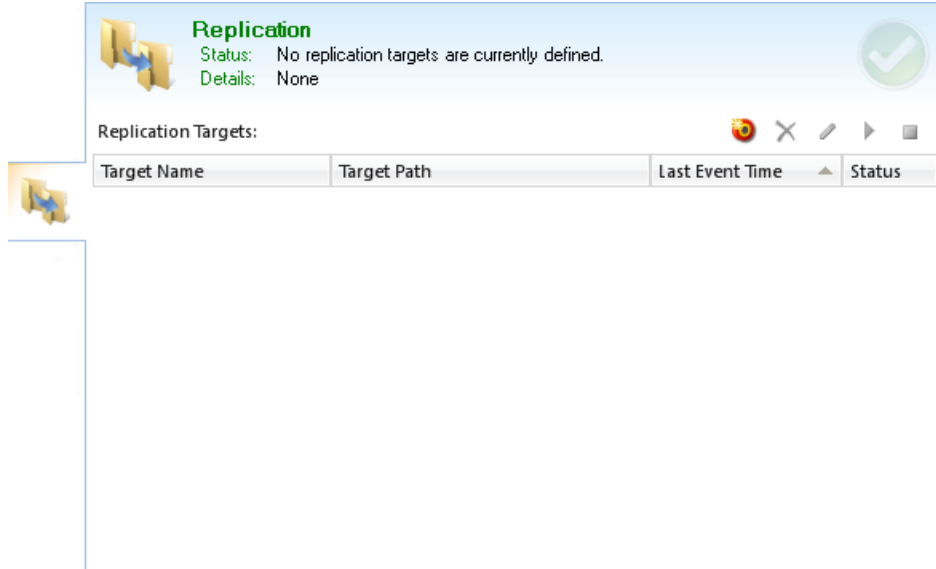
- In the Consolidation Settings dialog box, select the **Retention** tab, then specify the appropriate settings.

<b>Keep Intra-day image files</b>	(Default: 7 days) The minimum number of days to keep Incremental backup image files.
<b>Keep consolidated daily image files (-cd)</b>	(Default: 30 days) The minimum number of days to keep daily consolidated backup image files that have been rolled into a weekly consolidation.
<b>Keep consolidated weekly image files (-cw)</b>	(Default: 90 days) The minimum number of days to keep weekly consolidated backup image files that have been rolled into a monthly consolidation.
<b>Move consolidated image files to a subdirectory</b>	<p>(Default: Enabled) Following consolidation, ImageManager moves the source backup image files into a subdirectory (<code>Incrementals</code>) of the managed folder. This is for organizational purposes only.</p> <p> <b>Note:</b> The Incremental files in the <code>Incrementals</code> folder are "orphans" since they are no longer stored with their associated Full image. Do not attempt to restore these files from the <code>Incremental</code> folder.</p>

- Click **Save** to close the Consolidation Settings dialog box.

## Chapter 7: Replicating Backup Image Files

The ImageManager replication service lets you automatically copy backup image files to a secondary location. You can configure the verification service in the ImageManager Replication pane.





The ImageManager Replication pane


As part of the replication process, ImageManager replication considers your retention policy and other ShadowProtect settings so that it replicates only the backup image files necessary to ensure a full disaster recovery.

The key to using the replication service is to define a replication target. A *replication target* specifies both a destination for the replicated files, and a replication mode that defines how and when ImageManager replicates the files.

### To configure the replication target

1. Launch the ImageManager console.
2. In the Services pane, select **Replication** .
3. In the Replication pane, select **Define New Replication Target** .
4. In the Replication Target Settings dialog box, select the **Destination** tab, then specify the appropriate settings.

<b>Type</b>	<p>(Default: Local Drive) Identifies the type of replication target. Supported options include:</p> <p><b>Local Drive:</b> The replication target is attached to the local system (for example, an external hard drive). ImageManager.</p> <p><b>Network Drive:</b> The replication target is accessible via the local network (LAN).</p> <p><b>Remote Site:</b> The replication target is accessible via FTP (File Transfer Protocol).</p>
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	 <b>Note:</b> Use of replication target types other than Local Drive require additional fees.
<b>Security</b>	(Conditional) Used only when Type = Remote Site. Lets you select the type of secure connection you want to use when connecting to the FTP server. Supported values include: None, SSL, and SSH.
<b>Name</b>	(Optional) A descriptive name for the replication target.
<b>Path</b>	The path to the replication target. The path format varies by type. For example:  <b>Local Drive:</b> E:\Replicate <b>Network Drive:</b> \\serv1\Backup\Replicate <b>Remote Site:</b> ftp.corpl.com/replicate
<b>This target requires authentication</b>	When using Network or Remote Site replication targets, provide the authentication credentials necessary to access the network resource or FTP server, respectively.
<b>Don't replicate Base image files</b>	(Default: Enabled) Instructs ImageManager not to replicate the Base (Full) backup image file as part of the replication process. Due to the size of this file, some organizations might choose to create a secondary copy of this file out-of-band.

- In the Consolidation Settings dialog box, select the **Replication Mode** tab, then specify the appropriate settings.

You can distribute the effort of consolidating backup image files by replicating from one managed folder to another managed folder on a different system. By doing this, you can have one system perform daily consolidations while another performs weekly and monthly consolidations. The Replication Mode tab lets you configure your replication service to support your use of the ImageManager consolidation service.

<b>No. Replicate all consolidated files</b>	(Default: Enabled) Select this option when replicating to a folder that is not managed by ImageManager. You can choose the following options when replicating in this way:  (Default: Disabled) Also replicate the original Incremental backup image files. (Default: Enabled) When ImageManager deletes a backup image file, it also removes the file from the replication target.
<b>Yes. Replicate only intra-daily or consolidated daily image files</b>	(Default: Disabled) The replication target is also an ImageManager managed folder. You can choose one of the following options when replicating in this way:  (Default: Enabled) Replicate the original Incremental backup image files. This means that you plan on performing file consolidation at the replication target, rather than at the source managed folder.  (Default: Disabled) Replicate daily collapsed image files. This divides the consolidation effort between the source managed file (daily consolidation) and the replication target (weekly and monthly consolidations).

- Click **Save** to close the Replication Target Settings dialog box.

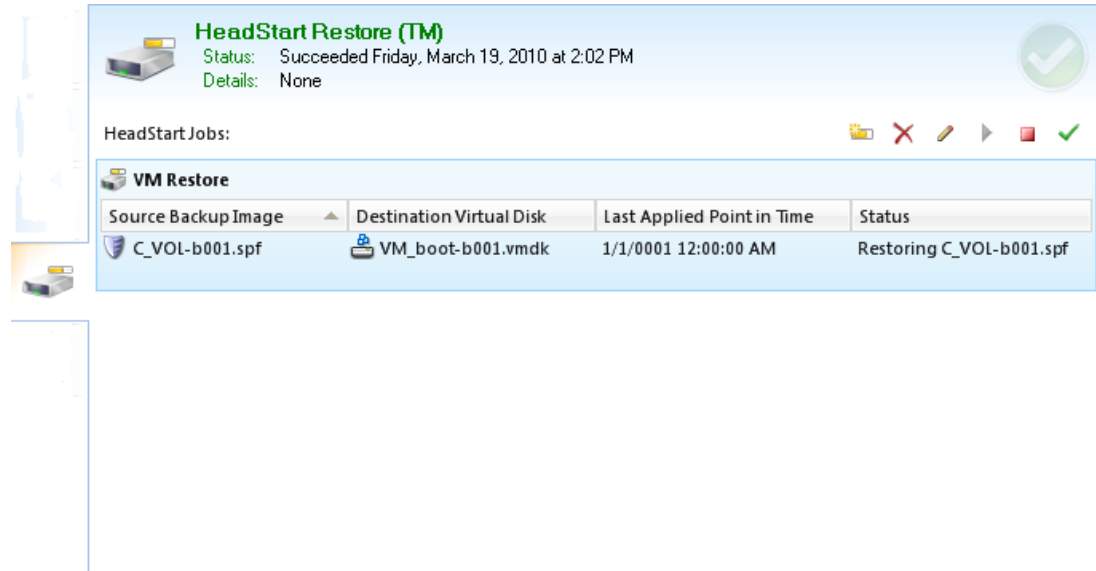


**Note:** For information about the other icons available in the Replication pane, see Section 3.3: Services Panel<sup>12</sup>.

## Chapter 8: Using HeadStart Restore

The ImageManager HeadStart Restore (HSR) service lets you start a restore operation while ShadowProtect continues to add Incremental backup image files to the image chain. This provides opportunity to greatly reduce the downtime associated with certain failover operations, particularly for systems that have very large storage systems (multi-Terabyte). For information about HSR use cases, see Section 2.2: Head Start Restore Scenarios [7].


You can access the backup image service service in the ImageManager HeadStart Restore pane.



The ImageManager HeadStart Restore pane

An HSR operation involves the following tasks:



- Creating a HeadStart Job [25]
- Finalizing a HeadStart Job [27]




 **Note:** For information about the other icons available in the HeadStart Restore pane, see Section 3.3: Services Pane [12].

### 8.1 Creating a HeadStart Job

From the HeadStart Restore pane, you can create a HeadStart job that defines a specific restore operation.

#### To create a HeadStart job

1. Launch the ImageManager console.
2. In the Services pane, select **HeadStart Restore** .
3. In the HeadStart Restore pane, click **Define New HeadStart Job** .
4. In the HeadStart Job Settings dialog box, select the **General** tab, then specify the appropriate settings.

<b>Type</b>	<p>The type Virtual Machine file that you want HeadStart Restore to create. Supported options include:</p> <p><b>VMWare VMDK:</b> Creates the HeadStart job as a Virtual Machine Disk (VMDK) file compatible with VMWare virtual environments.</p> <p><b>Microsoft VHD:</b> Creates the HeadStart job as a Virtual Hard Disk (VHD) file compatible with Microsoft and Hyper-V virtual environments.</p>
<b>Name</b>	(Optional) A descriptive name for the HeadStart job.
<b>Folder</b>	The folder where you want to create the virtual disk file.
<b>Authentication</b>	(Default: Disabled) If the specified folder requires authentication to access it, provide the appropriate credentials (Domain/Computer/NAS name, Username, and Password).
<b>HeadStart Volumes</b>	<p>Lists the currently defined HeadStart targets for this job. A <i>HeadStart target</i> defines both a source backup image and a destination virtual disk file.</p> <p><b>To create a HeadStart target</b></p> <ol style="list-style-type: none"> <li>Select <b>Add HeadStart Targets</b> .</li> <li>In the Base Backup Images dialog box, select the volumes to include in the HeadStart job.</li> <li>Provide the backup image file password, if necessary.</li> <li>Click <b>OK</b>.</li> </ol> <p>HeadStart Volumes also provides the following icons for managing the volumes once created:</p> <ul style="list-style-type: none"> <li> Deletes the selected HeadStart volume.</li> <li> Opens the HeadStart Target dialog box, where you can change the destination file name or password used to open the backup image files.</li> </ul>






5. In the HeadStart Job Settings dialog box, select the **Options** tab, then specify the appropriate settings.

<b>Lag Time</b>	<p>The lag time associated with a HeadStart job. You can set the lag time in hours (1 - 23) or days (1 - 30).</p> <p><i>Lag time</i> defines the delay between when ShadowProtect creates a new Incremental backup and HeadStart Restore applies that backup to the HeadStart volume. The lag time protects you by giving you time to identify any problems (system error, corruption, virus, etc.) with the Incremental backup before applying it to the HeadStart volume</p>
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6. Click **Save** to close the create the HeadStart job.

Once created, ImageManager enables the HeadStart job and displays it in the HeadStart Jobs list.



The HeadStart Restore pane also provides the following icons for managing HeadStart Restore jobs:

	Delete the selected HeadStart job.
	Edit the selected HeadStart job.
	Enable the selected HeadStart job.
	Disable (suspend) the selected HeadStart job.
	Finalize a HeadStart job (see Finalizing a HeadStart Job <a href="#">[27]</a> ).

## 8.2 Finalizing a HeadStart Job

Once created and enabled, an HSR job begins the process of restoring a volume from its backup image files. However, the restored volume, contained in a virtual disk file, remains unusable until finalized. This prevents users from inadvertently accessing the volume before the restore operation is complete.

### To finalize a HeadStart job

1. Launch the ImageManager console.
2. In the Services pane, select **HeadStart Restore** .
3. In the HeadStart Restore pane, click **Finalize Targets in HeadStart Job** .
4. In the Finalize dialog box, provide the required information, then click **Finalize**.

<b>HeadStart Volumes</b>	Select one or more HeadStart volumes to finalize.
<b>Finalize to</b>	For each HeadStart volume that you want to finalize, specify the date that you want to finalize it to. Once finalized, the restored volume will exist in the state it was in on the selected date.  Select <b>Automatically pick most recent backup image</b> to finalize the restored volume to the state contained in its most recent Incremental backup.

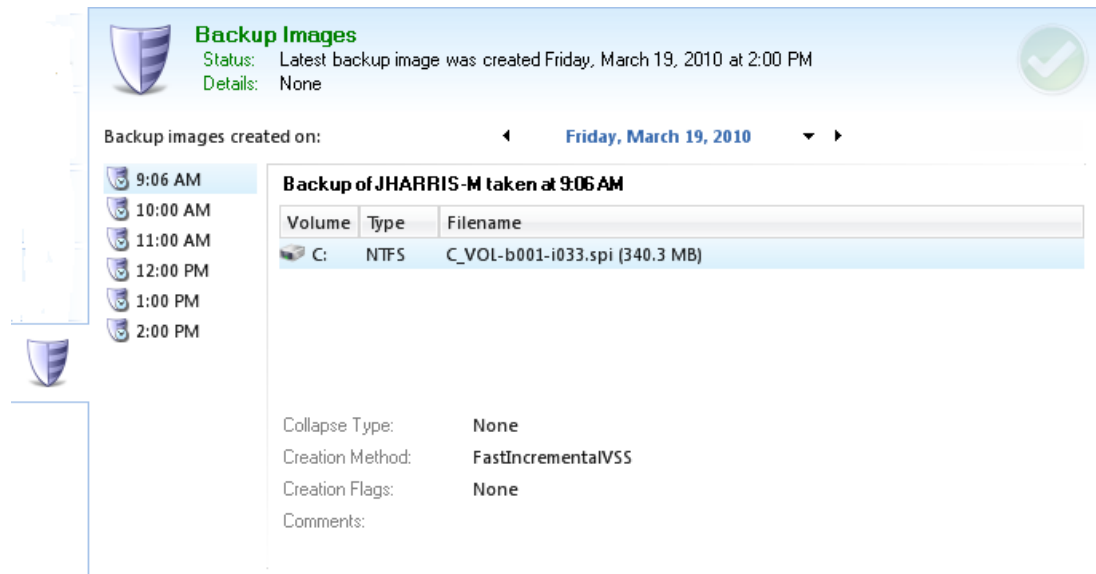
Once finalized, you must do the following to use the virtual disk file in a virtual machine.

- If the restored volume is bootable, load StorageCraft recovery environment and run Hardware Independent Restore (HIR) to setup the hardware configuration in the virtual disk file to match the settings in the virtual machine. The Recovery Environment displays virtual disk files as available drives that you can work with. For more information about the Recovery Environment and HIR, see the *Recovery Environment User Guide*.
- Add the virtual disk file to a virtual machine. The specifics of this process vary depending on your virtual machine software. Consult your virtual machine documentation for more information.

## Chapter 9: Browsing Backup Image Files


The ImageManager backup images service lets you view a historical record of your backup image file creation. It also lets you mount and browse a selected backup image file. The mount feature is similar to the manual process provided by ShadowProtect in the Mount Wizard (see "Mounting a Backup Image File" in the *ShadowProtect User Guide*).

You can access the backup image service service in the ImageManager Backup Images pane.



The ImageManager Backup Images pane

### To browse existing backup image files

1. Launch the ImageManager console.
2. In the Services pane, select **Backup Images** .
3. In the Backup Images pane, browse to the desired backup image file.

You can browse the backup image files available in the selected managed folder by:

- Use the left-arrow icon ◀ and the right-arrow icon ▶ to browse through dates. By default, the Backup Images pane displays the current date.
- Use the down-arrow icon ▼ to open a calendar from which you can select a specific day to view.
- For each date, ImageManager displays a list of times where backup image files were created in the selected managed folder.
- Select a time to see a list of backup image files created at that time and date.

## Chapter 10: Product Support

Technical support for StorageCraft products is available beginning with the release of the product and ending six months after the release of the next major version of the product or after StorageCraft discontinues the product line.

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In order to ensure efficient service, please provide at a minimum the following information:

- Product name and version number
- Detailed problem description, error code, log file description, etc.
- Hardware and software configuration, operating system version, service pack number, etc.

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## Chapter 11: Glossary

**Backup:** The activity of copying files, volumes, and databases to preserve them in case of equipment failure or other catastrophe. An important part of a disaster recovery strategy, backup is often neglected, particularly for personal computer users.

**Backup Image File:** Files that contain the contents of a backup activity, Backup Image Files let you restore the contents of a computer system to a specific point-in-time.

**Bare Metal Recovery:** The complete restoration of computer data after a catastrophic failure, including the operating system, file system, partitions, volumes and data, from a complete backup image.

**Base Image File:** Backup files that contain a copy of all used sectors on a disk drive. This image file contains all data on the computer, including the operating system, applications, and data.

**Basic Disk:** A physical disk drive that can be accessed by MS-DOS\* and all Windows\* operating systems. Basic disks can contain up to four primary partitions, or three primary partitions and an extended partition with multiple logical drives.

**Cold Backup:** A backup taken from the Recovery Environment, rather than when the computer's operating system is loaded.

**Continuous Incrementals:** A backup scheduling model for ShadowProtect that lets you create a base backup file, then create additional incremental backup files that include only changes that occurred since the last backup.

**Compression:** A technology that reduces the size of a file. Compression lets you save time, bandwidth and storage space.

**Differential Image File:** Backup files containing the hard drive sectors that have changed since the Base Image File was created. Differential image files take about the same time to create as Base Image Files, but they are smaller. When restoring a drive (or files and folders), you must use the Base Image File with the appropriate Differential Image File to restore the computer to a specific point-in-time.

**Disaster Recovery:** The ability to recover from the complete loss of a computer, whether due to natural disaster or malicious intent. Typical disaster recovery strategies include replication and backup/restore.

**Disk Device:** A locally accessible disk drive, including locally attached USB or FireWire disk drives, and network drives such as SAN, NAS, iSCSI, SCSI, USB or FireWire.

**Driver:** A program that interacts with a particular device or software. The driver provides a common interface to the device, or software, that makes it accessible to other computer systems and the user.

**Drive Letter:** See Mount as Drive Letter.

**Dynamic Disk:** A physical disk that provides features that basic disks do not (see Basic Disk), such as support for volumes spanning multiple disks. Dynamic disks use a hidden database to track information about dynamic volumes on the disk and other dynamic disks in the computer.

**Encryption:** A procedure that renders the contents of a file unintelligible to anyone that cannot present the appropriate decryption key.

**ExactState™ Imaging:** The ability to create a backup image at a point where the computer is in the best state for creating a backup (for example, no open files).

**Full Image File –** See *Base Image File*.

**Hard Drive:** An electromagnetic storage device, also referred to as a “disk drive,” “hard drive,” or “hard disk drive” that stores and provides access to data on a computer.

**Head Start Restore (HSR):** The ability to begin the restoration of a large backup image chain while ShadowProtect continues to add Incremental backup image files to the same image chain. This reduces the time necessary to restore a large volume from days or weeks, to minutes or just a few hours.

**Hot Backup:** A backup image taken when ShadowProtect is loaded on the computer's standard operating system. A hot backup requires the use of a snapshot filter driver (see Snapshot).

**Hot Restore:** The restoration of a backup image while the computer or server remains up and running. You cannot perform a hot restore of a system volume.

**Image or Image File:** See *Backup Image File*.

**Image Set:** The combination of a Full image and all additional Incremental images necessary to restore a computer to a given point-in-time.

**Incremental Image File:** Backup files containing the sectors that have changed since the last Incremental backup was taken. Incremental Images are fast to create and smaller than either Base Image Files or Differential Image Files. When restoring a drive (or files and folders), you must use the Base Image File and the appropriate Incremental Image Files necessary to restore the computer to a specific point-in-time.

**Lock Volume:** A software request to gain exclusive access to a particular drive. Locking the volume prevents other software programs from changing the file system or opening files during the process of writing the image file.

**Microsoft VolSnap:** The proprietary Microsoft snapshot technology.

**Microsoft Volume Shadow Copy Service (VSS):** The backup infrastructure for Microsoft Windows XP and Microsoft Windows Server 2003 operating systems, as well as a mechanism for creating consistent point-in-time copies of data. The Volume Shadow Copy Service produces consistent snapshots by coordinating with business applications, file-system services, backup applications, fast-recovery solutions, and storage hardware.

**Mount as Drive Letter:** The process of assigning volumes (active primary partitions and logical partitions) to specific letter designators in the root namespace of a Microsoft operating system. Unlike mount points (see Mount Point), drive letter assignment permits only letters in the namespace, and they solely represent volumes. In other words, it is a process of naming the roots of the "forest" that represents the file-system (with each volume being an independent tree therein).

**Mount Point:** A directory on a volume that an application can use to "mount" (set up for use) a different volume. Mount points overcome the limitation of drive letters (see Mount as Drive Letter) and allow for more logical organization of files and folders.

**Mounted Volume:** The ability to see and use a backup image that is physically located somewhere else on the network. When mounted, the backup image appears as a volume and behaves as if it is a part of the local computer system. Mounted volumes are read/write capable so users can update existing image files, scan for viruses or other malware, and repair the image file.

**Operating System:** Software that, after being loaded into the computer by a boot program, manages all other programs on a computer. Other programs are called *applications* or application programs.

**Partition:** The portion of a physical disk that functions as though it were a physically separate disk. Once created, a partition must be formatted and assigned a drive letter before data can be stored on it. On basic disks, partitions can contain basic volumes, which include primary partitions and logical

drives. On dynamic disks, partitions are known as dynamic volumes and come in the following types: simple, striped, spanned, mirrored, and RAID-5 (striped with parity) volumes.

**Restoring:** The activity of retrieving computer data from a previously saved backup image file.

**Snapshot:** A type of backup that provides a point-in-time view of a volume. When you perform a backup or scheduled backup, ShadowProtect uses either StorageCraft Volume Snapshot Manager (VSM) or Microsoft Volume Shadow Copy Service (VSS) to take a snapshot of the volume. Any changes that occur to the volume after the snapshot is taken are not included in the backup.

**.spf:** A file extension representing a ShadowProtect full or base image file.

**.spi:** A file extension representing a ShadowProtect incremental or differential image file.

**.sp(number):** A file extension representing a ShadowProtect image file that spans multiple files. The number following `.sp` is the sequence of the file in the spanned image file group.

**Point-In-Time Backup:** A backup routine that lets you restore a file, folder, or the entire system to a specific point-in-time. Point-in-time backups are often used to roll-back a computer to a point prior to a computer problem.

**Protected Volumes:** Volumes that users have selected for backup by ShadowProtect.

**RAID:** Redundant Array of Independent Disks. A collection of disk drives that offers increased performance and fault tolerance. There are a number of different *RAID* levels. The three most commonly used are 0, 1, and 5:

- Level 0: striping without parity (spreading out blocks of each file across multiple disks).
- Level 1: disk mirroring or duplexing.
- Level 5: block-level striping with distributed parity.

**Real-Time:** A level of computer responsiveness that a user perceives as essentially immediate, or that enables the computer to keep up with some external process such as backing up.

**Recovery Environment:** See StorageCraft Recovery Environment.

**Remote Computer (Node):** A computer that is physically located somewhere else on a network but is accessible from a local computer.

**Service:** A program, routine, or process that performs a specific system function to support other programs, particularly at a low (close to the hardware) level.

**Scheduled Job:** A job created in the ShadowProtect interface. Scheduled jobs let ShadowProtect backup events to occur automatically.

**Spanned Image Set:** A Backup Image File that has been divided into multiple smaller files for easier management or storage. This lets you save the Backup Image File to removable media such as a CD or DVD.

**StorageCraft Recovery Environment:** A secondary boot environment (or operating system) that gives a user the functionality necessary to access and restore Backup Image Files on a network. This environment is typically used when a drive cannot be restored from within Windows or when the computer has suffered a catastrophic failure and the entire hard drive must be restored.

**System downtime:** The amount of time a server or PC is offline and inaccessible to users. This is commonly known as having the system out of production.

**System Volume:** The volume that stores the boot files necessary to load an operating system. Typically, this is the `C:\` volume.

**Tray Icon:** A graphical representation of a computer program or application. For example, ShadowProtect uses a tray icon for the user to gain information about the program. Tray icons reside in the system tray.

**UNC (Universal Naming Convention):** A method used to identify folders, files and programs on a network computer. A UNC path begins with two backslashes \\ followed by the server name, share name, directory and filename. For example, \\server\_name\share\_name\backup\_name.spi.

**Unprotected Volumes:** Volumes not protected by ShadowProtect.

**User Interface (UI):** The portions of a computer system with which a user interacts (display, keyboard, mouse, etc.) and the portion of a software program that accepts and responds to user interaction.

**Virtual Private Network (VPN):** A private data network that makes use of the public telecommunication infrastructure. VPNs maintain privacy through the use of tunneling protocols, encryption, and other security procedures.

**VirtualBoot:** The ability to create a Virtual Machine based on an existing backup image chain. Once started, the VM provides complete access to data, applications, and services provided by the original system, in a state corresponding with the last Incremental image included in the VM.

**Virtual Volume:** A locally referenced volume that does not physically exist on the system. ShadowProtect uses virtual volumes for the benefit of protecting computer systems.

**Volume:** An area of storage on a hard disk. A volume is formatted by using a file system, such as file allocation table (FAT) or NTFS, and typically has a drive letter assigned to it. A single hard disk can have multiple volumes, and volumes can also span multiple disks.

**VSS Aware:** An application designed to work with Microsoft Volume Shadow Copy Services (VSS) framework to ensure consistent data backup.

## Chapter 12: End User License Agreement

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