

Disc Image

the virtual CD/DVD system

Version 2.0

<http://www.pa-software.com/>
sales@pa-software.com

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Using This Documentation

This documentation consists of a collection of "how to" topics organised by subject matter. You can access each topic directly from the table of contents in the left pane, from a link in another help topic, from the results of a search, or from your own custom list of favourites.

Interactive Document Conventions

This document includes many interactive features that you can use to open applications and navigate among the topics in the documentation set, to Web sites, and to other documentation sets.

Printing Topics

You can print single topics from this document by right-clicking the topic in the right pane or in the table of contents and clicking **Print** from the shortcut menu. You can print a group of related topics by right-clicking a node in the table of contents and clicking **Print** from the menu.

Disc Image Information

The Disc image system is a driver that can mount ISO CD/DVD images into a Microsoft Windows 2000/XP based system. This gives the impression that a new CD/DVD-ROM drive has been added and a disc has been inserted. The small size of the driver and its simple operation allow an integration which is similar to actually using CD/DVD-ROM hardware. It is even possible to mount as many images as there are available drive letters.

The Disc image system can mount ISO images that contain either ISO9660 or Joliet (or both) file systems, which on a Windows 2000/XP based system allows nearly all ISO images to be mounted. It will not allow images to be mounted if Windows does not read that type of file system e.g. HFS+.

For single users the Disc image system allows you to store frequently used CD/DVD images so they can be accessed quickly and quietly (no more loud whirring noises). It will also eliminate the need to have a disc left in the CD/DVD drive when running applications that require access to the disc. When using on a laptop, it allows better use of the battery as CD/DVD drives require a large amount of power, especially when the drive is running continuously.

When you create ISO disc images with products such as Nero, the created images can be mounted using the Disc image system, allowing them to be tested before being burned to discs, thus reducing disc wastage.

For networks that require a secure central location, or just want to store images in an easy to reach place, the Disc image system will allow those images to be mounted locally. This in turn protects certain images from unauthorised use and allows software stored on servers to be installed without finding the installation CD/DVD(s). There is no need for special server software as the small driver is installed on each of the targets. As the Disc image system works with the ISO standard, it gives you the opportunity to store images that can be accessed by other operating systems, such as Apple Macintosh OS X and Unix as they already have the built-in ability to mount ISO

Disc Image - What's new in version 2.0

Disc Image now includes an ISO image editor. The editor is used to create images based on a compilation of files and folders. The images can also include a number of different file systems. With a simple user-friendly and intuitive interface, creating images ready for mounting has become more of a pleasure than a pain.

Getting started with Disc Image

To mount an image you have already, or to create a new image, you should have a thorough understanding of the following features and the use of the following components:

- **Create.** In this section you learn how to create an image. [More...](#)
 - **Running.** In this section you learn how to mount an ISO image. [More...](#)
 - For problem-solving instructions, see [Troubleshooting](#).
-

Running Disc Image

To mount an ISO image:

- Right-click on the ISO image and select **Mount image**.
- Or double-click on the ISO image depending on the type of installation chosen.

To un-mount an ISO image:

- Right-click on the CD/DVD drive in Explorer and select **Eject**.

 **Note** If an image will not eject, use the **Image Mount** application to force an un-mount.

When mounting network images (professional only) the source image can be a UNC (universal naming convention) file or from a mapped drive e.g.:

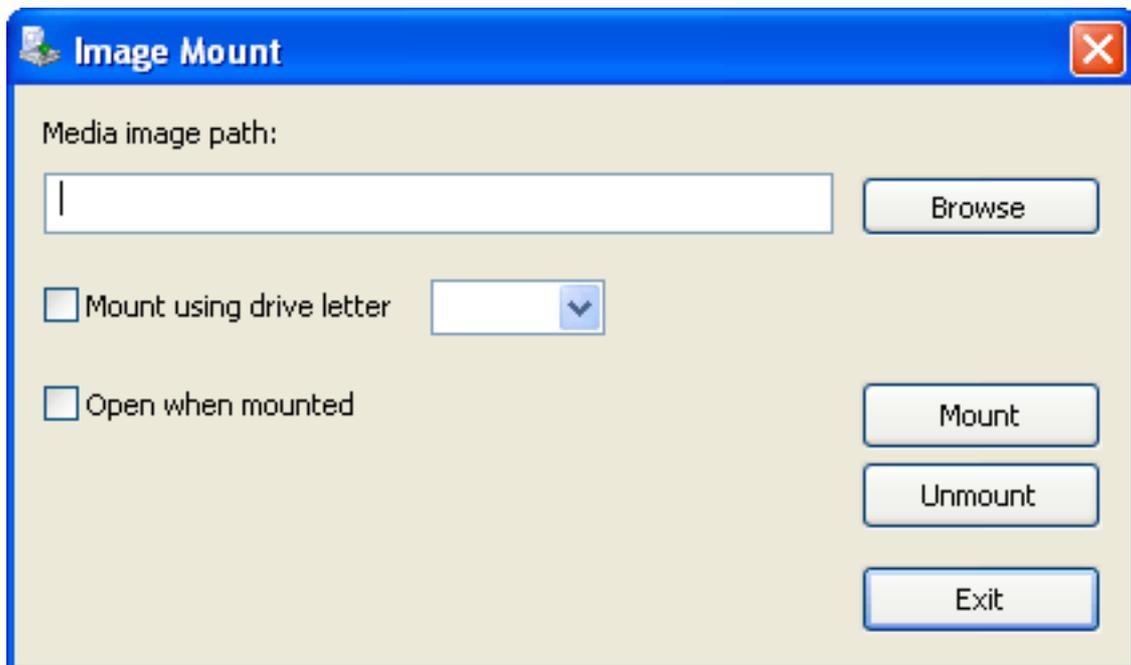
`\\<server name>\<share point name>\<image name>`

or

`U:\<image name>`

Image Mount

The **Image Mount** application allows you to mount and un-mount images with more control.

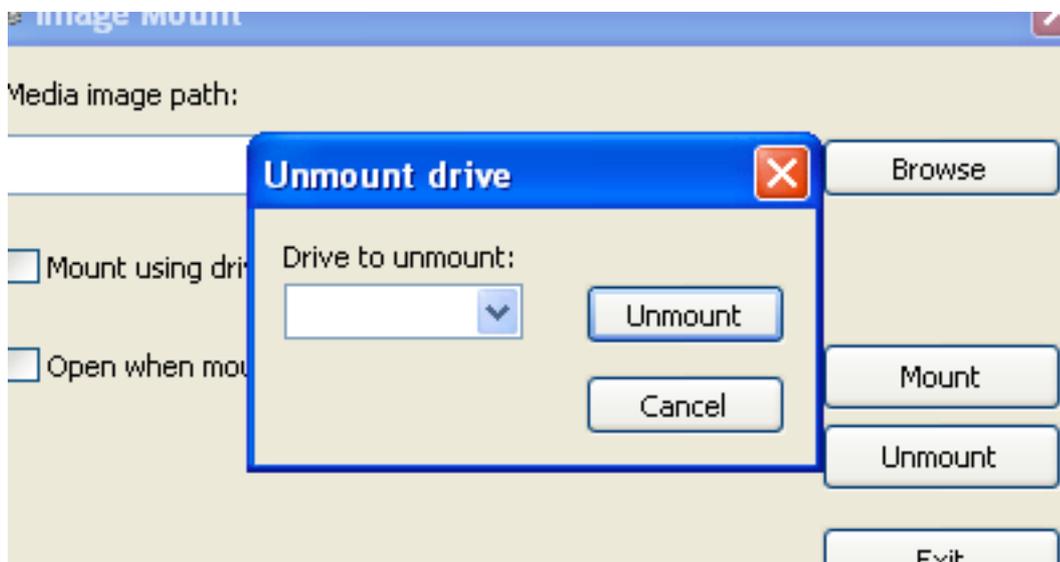


To mount an image:

1. Start **Image Mount**: On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Image Mount**.
2. In **Image Mount**, select the ISO file by entering the name into the media path field or by clicking on the **Browse** button.
3. Optionally select a drive letter to use for the mounted image.
4. Select the **Open when mounted** check box if required.
5. Click **Mount**.

To un-mount an image:

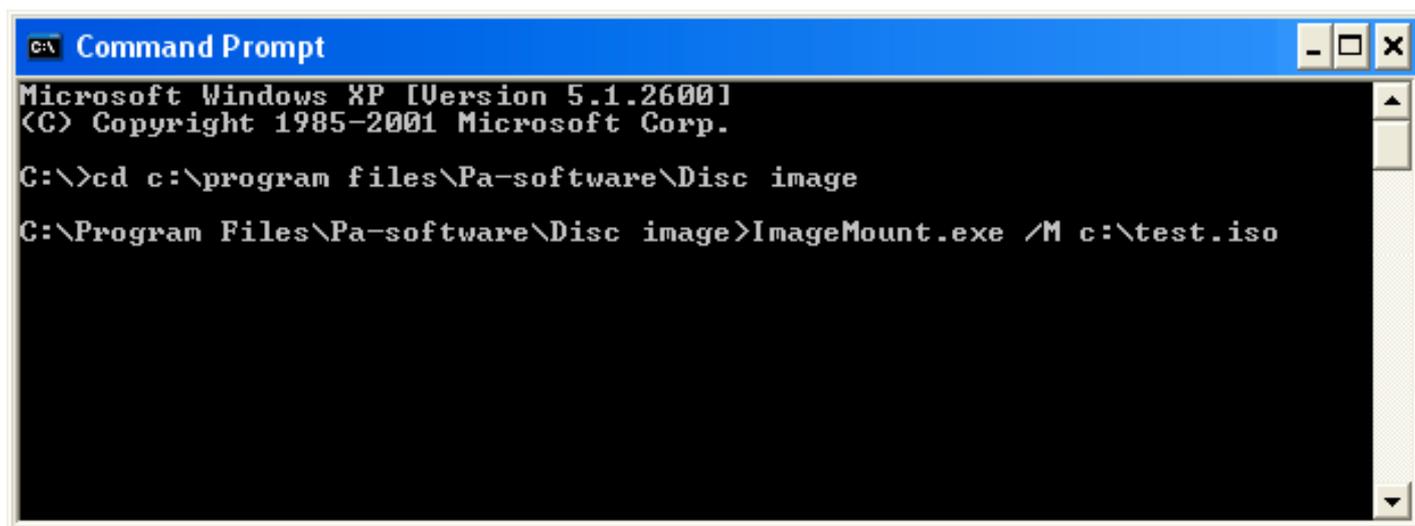
1. Start **Image Mount**: On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Image Mount**.
2. Click **Unmount**.
3. Select the required drive i.e. the drive letter that was used to mount the image.



4. Click **Unmount**.

Image Mount - Command line support (Professional version only)

The **Image Mount** command line support allows you to mount and un-mount images via the **Command prompt** or within scripts and batch files.



```
C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>cd c:\program files\Pa-software\Disc image
C:\Program Files\Pa-software\Disc image>ImageMount.exe /M c:\test.iso
```

To mount an image:

1. Start the Command prompt: On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
2. In command prompt window enter:
`ImageMount.exe /M <imagename>`

Note

Quotes must be used when using file names with spaces.
When mounting network images the full UNC path should be used e.g. '\\pa-software\images\test.iso'.

3. Optionally select a drive letter to use for the mounted image e.g.:
`ImageMount.exe /M <imagename> W`

This will mount the image 'imagename' using the drive letter 'W' (if 'W' is available).

To un-mount an image:

1. Start the Command prompt: On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
2. In command prompt window enter:
`ImageMount.exe /U <drive>`

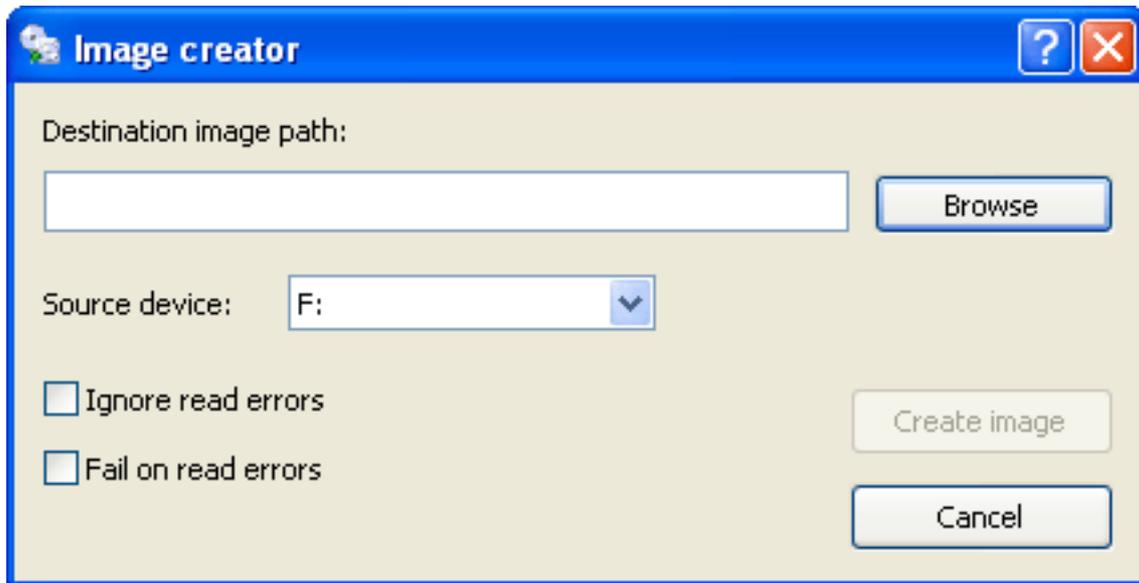
Where drive is letter that the image was mounted into e.g. 'W'.

 **Note** When using the command line option in scripts and batch files. It is best to add the switch `/Q` to stop any error or information messages being shown e.g.:

ImageMount.exe /M <imagename> /Q

Image creator

The **Image Creator** application allows you to create an image from a CD/DVD drive.



- [To create an ISO image from a CD or DVD.](#)

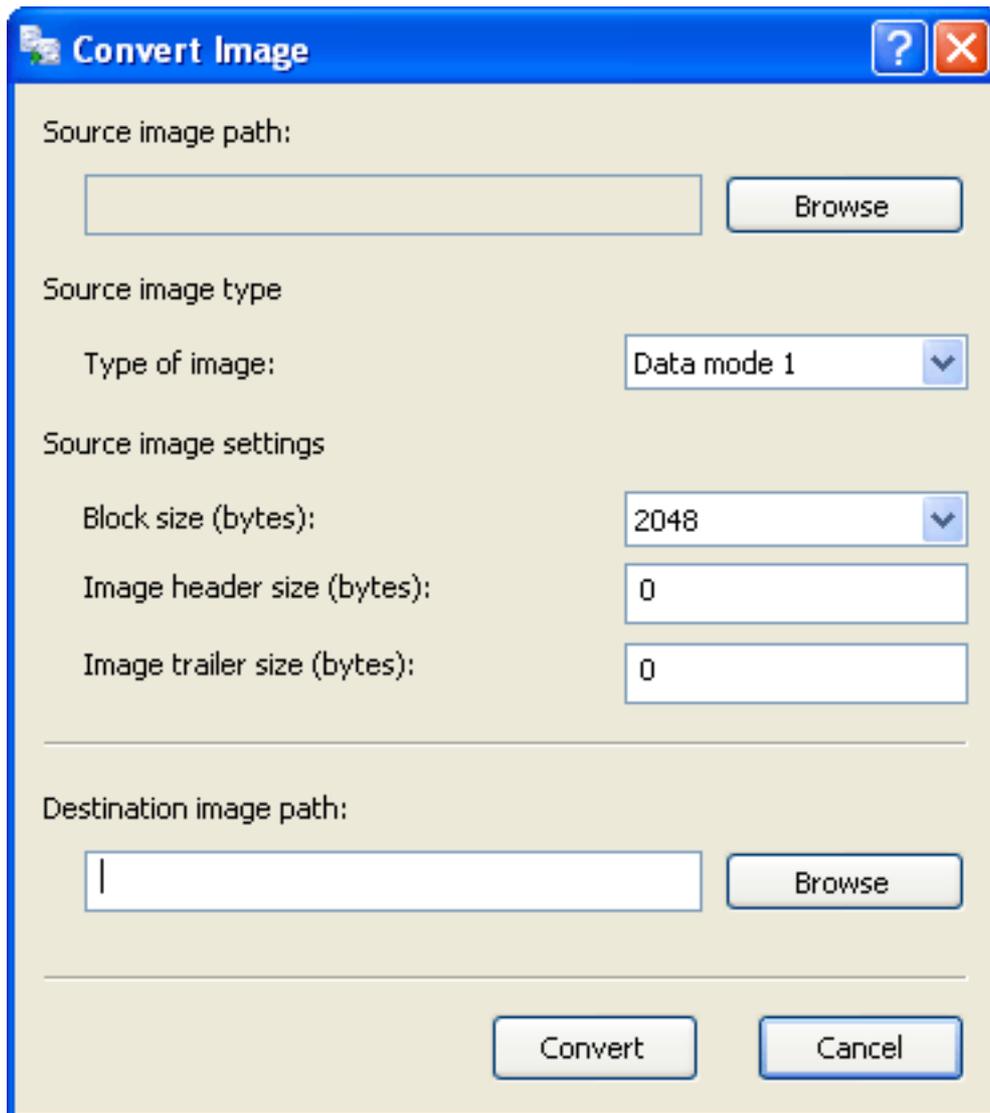
Creating an image

To create an **ISO image** from a CD or DVD:

1. Start **Image Creator**: On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Image Creator**.
 2. In the **Destination image path**, enter the path and name of the image that is being created or click **Browse** to chose a path.
 Note The name should use the extension **.iso**.
 3. From the **source device** drop down list select the CD/DVD drive that contains the source image.
 4. Optionally select **Ignore read errors** to allow images to be created even if the source media is damaged.
 Note The damaged sections will not contain valid data and should be used with caution.
 5. Optionally select **Fail on read errors** which will ensure that images are **not** created when faulty source media is used.
 6. Click **Create image** to start the creation process.
-

Image converter

The **Image Convert** application allows you to convert images from binary types other than ISO such as '.bin/.mdf/.cdi/.nrg'. Even unknown format images can be converted if the image destination geometry is known.



- [To convert a binary image to an ISO image.](#)

Converting an image

To convert a binary image to an **ISO image**:

1. Start **Image Convert**: On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Image Convert**.
 2. For the **Source image path**, click on the **Browse** button to enter a source binary image.
 3. If the geometry has not been automatically set, then it must be set manually.
It is best to keep the default settings if the source image is of an unknown format, but if the image format is known then it should be set before the ISO image is created, otherwise the new image will be invalid.
 **Note** If the geometry is found the user settings will be disabled.
 4. In the **Destination image path**, enter the path and name of the image that is being created or click **Browse** to chose a path.
 **Note** The name should use the extension **.iso**.
 5. Click **Convert** to start the conversion process.
-

Tray Menu

The **Tray Menu** application allows you to easily mount images, by a simple selection of the menu located in the taskbar.



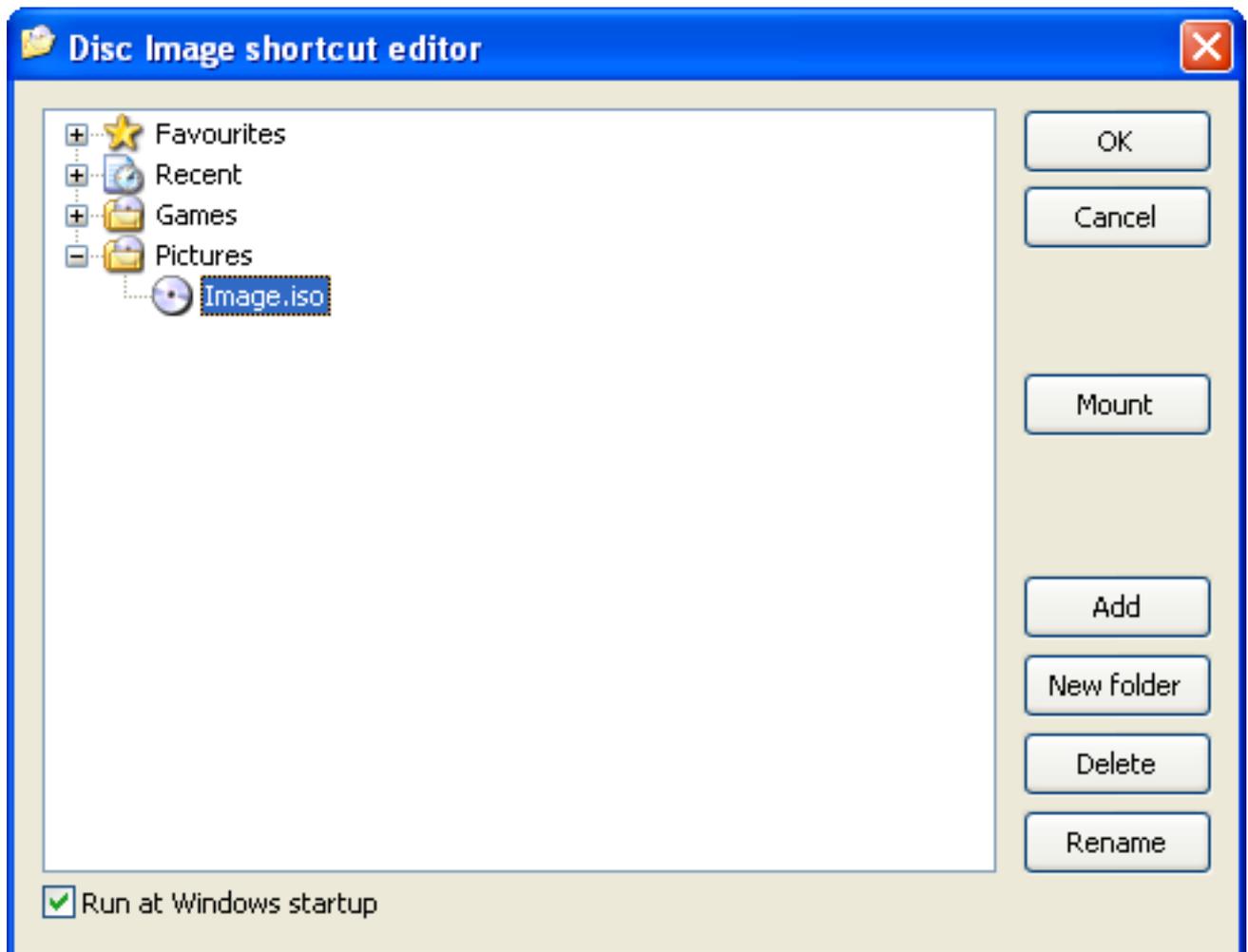
To mount an **ISO image**:

1. Start **Tray Menu** (if it is not already running): On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Tray Menu**.
 2. Select a menu item from the Recent sub menu to mount a recently used image.
- [To create and edit shortcut links and folders.](#)
-

Editing shortcut links and their folders

Creating shortcut links in the **Favourites** folder:

1. Start **Tray Menu**.
2. Select the **Show Editor** menu item.



3. Select the **Favourites** folder (or any other folder).
4. Click **Add**.
5. Select an ISO image from the Open dialog box, and click **Open**.
The ISO image shortcut link will now show as an item of the **Favourites**.

Note This method will also allow you to add shortcut links to other folders, including user-defined folders.

Creating your own user-defined folders:

1. Click **New folder**, to create a place to hold the new shortcut links.

A new folder is displayed with the default name, 'New Folder'. Type a name for the new folder, and then press ENTER.

To change the name of a user-defined folder:

1. Click the folder you want to rename.
2. click **Rename** to rename this folder.
Type the new name, and then press ENTER.

Deleting a shortcut link or folder:

1. Select the shortcut link or the folder you want to delete.
2. Click **Delete**.
You will be asked to confirm the deletion before the item is actually deleted.

 **Note** Deleting a folder will also delete the shortcut links within the folder.

Running **Tray Menu** at Windows startup:

- When **Disc Image Tray Menu** is installed, it is run at Windows startup by default.
If you do not want to run **Tray Menu** at Windows startup, then uncheck the check box 'Run at Windows startup'.
-

Image Editor

The **Image Editor** application allows you to create many different kinds of ISO images quickly and simply.

- ISO CD
- ISO/UDF CD
- ISO DVD
- ISO/UDF DVD
- Video DVD (pro only)

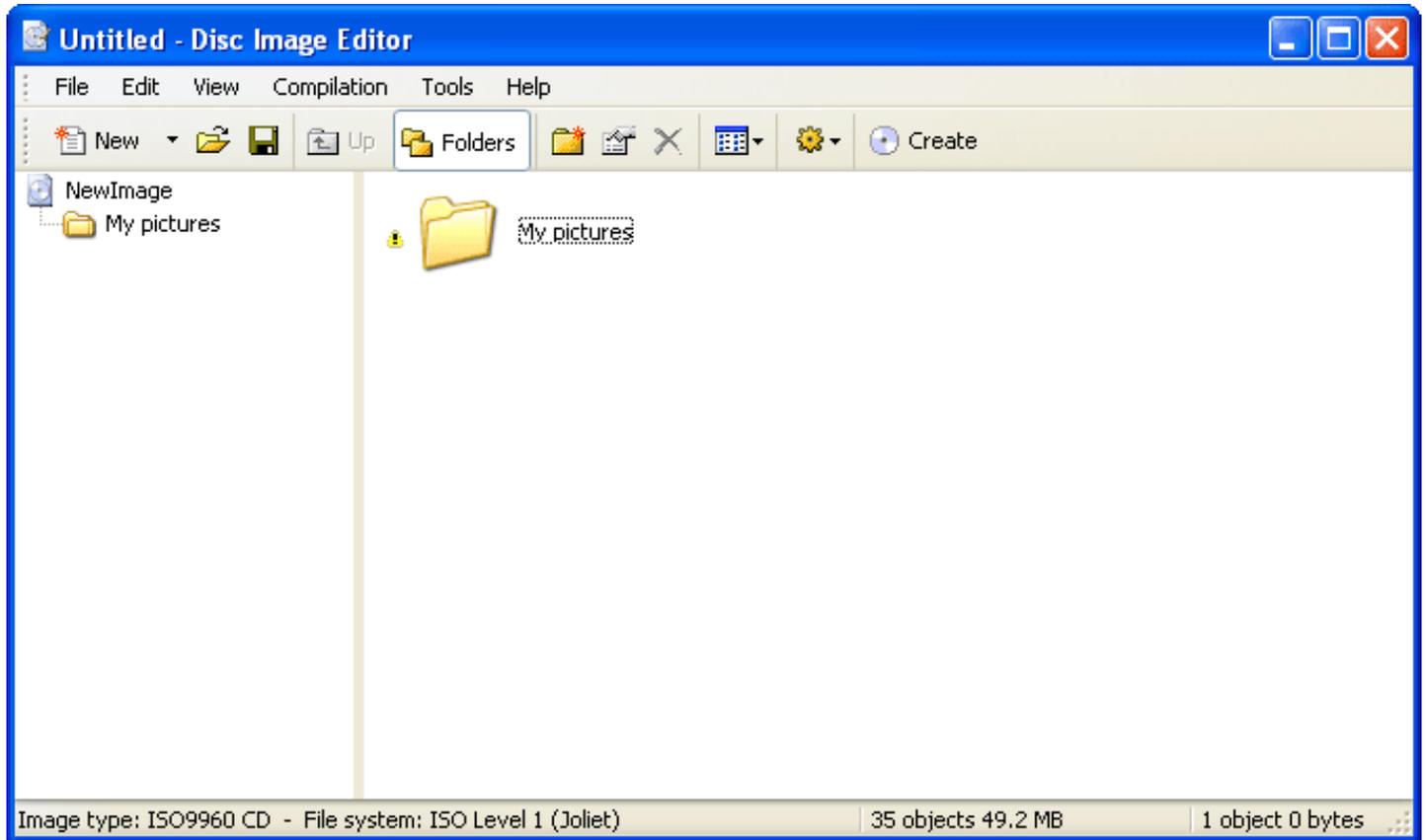
See [image types](#) for more information.

Whether you wish to create a Data CD, Video DVD or a Data DVD; the procedure is the same in each case. Just drag the files and folders with the mouse from Windows Explorer to the compilation window and click on the **Create image** button.

- [Create an ISO image](#)
-

Image Editor Main Window

From within the main window, you can perform all the required actions to create an image.



For a basic step-by-step guide on how to create an image [Click here](#)

The main points dealt with in this help are:

- [View](#)
- [Compilation properties](#)
- [Validation and layout](#)
- [Image types](#)
- [File system view](#)
- [Image Editor options](#)
- [Item properties](#)
- [Source properties](#)
- [Command line support](#) (professional only)

Creating an ISO image file

This is a step-by-step guide to creating an ISO [image file](#) using **Image Editor**:

1. Start **Image Editor**: On the **Start** menu, point to **Programs**, point to **Disc Image**, and then click **Image Editor**.
2. From the **File** menu, point to **New**, and then click **New ISO CD** (or the preferred media type).
3. From the **Compilation** menu, click **Add files** and select the required files from the file browser.
Note Folders can only be added using the **Add folder** menu item.
4. Setting the image name:
 - From the **Compilation menu**, click **Compilation properties**.
 - Select **Label** tab and enter the required image name.
Note The name can be in both ISO and Joliet formats (or both).
5. From the **Compilation** menu, click **Create image**.
6. Select the destination for the created image, and if required change the file name.
7. Click **Save** to start the creation process.

Note

- In addition to using the menu items **Add files** and **Add folder**, items can be added by dragged and dropped using Windows Explorer (or even from the desktop).
-

View options

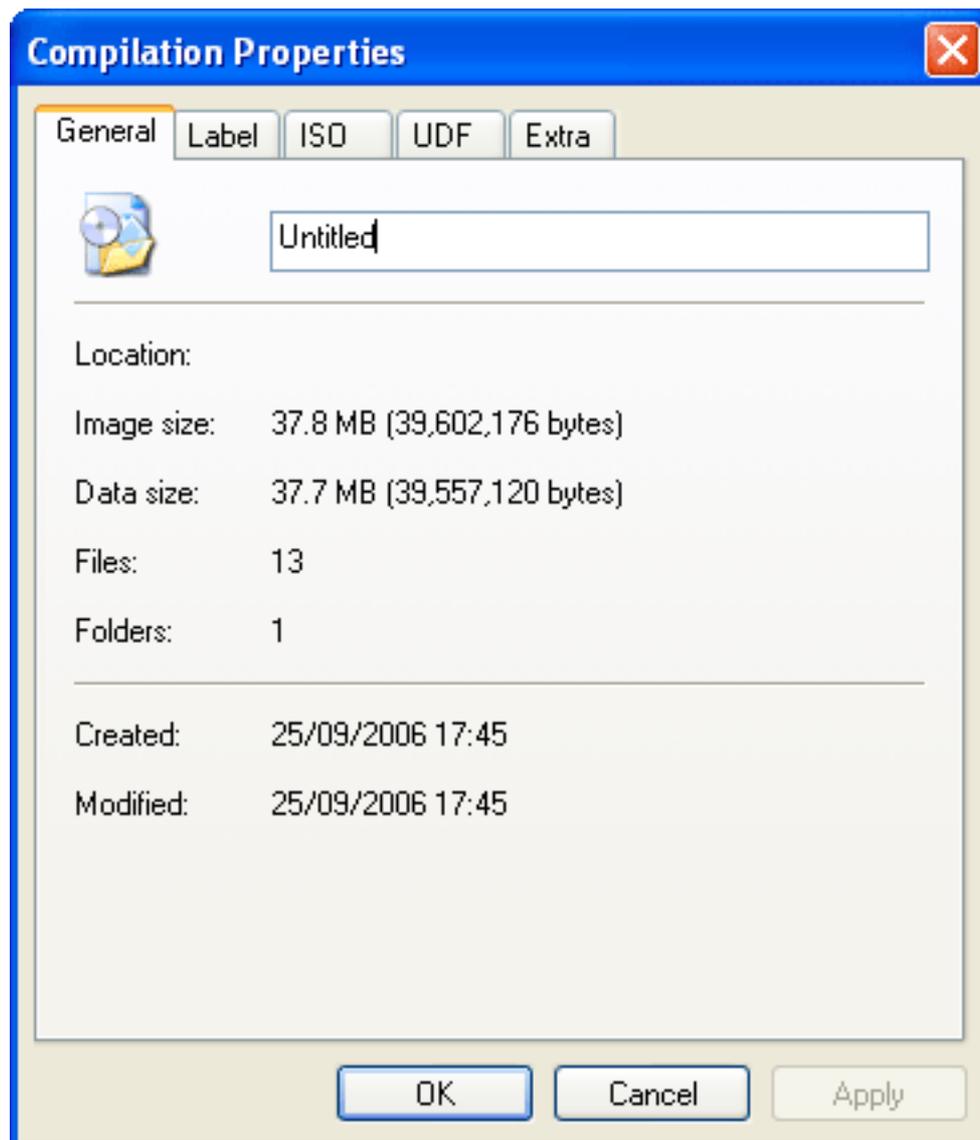
Image Editor provides several ways for you to arrange and view your files:

- **Tiles (Windows XP or newer)**
Tiles view displays your files and folders as icons. The icons are larger (depending on the options) than those in Icon view, and the item information is displayed under the file or folder name (which is to the side of the icon).
- **Large Icons**
Icons view displays your files and folders as icons. The file name is displayed under the icon; however, item information is not displayed.
- **Small Icons**
Small Icons view displays your files and folders as small icons. The file name is displayed to the side of the icon; however, item information is not displayed.
- **List**
List view displays the contents of a folder as a list of file or folder names preceded by small icons. This view is useful if your folder contains many files and you want to scan the list for a file name.
- **Details**
In Details view, the contents of the folder are shown with detailed information about the files, including name, type, size, date modified and validity.

For information on the file system view, click [here](#).

Image Editor: Compilation properties

From within the compilation properties you can change the way the image is created, by setting the type of [ISO 9660](#) file system, or by adding [Joliet](#) or [Rock Ridge](#) support.



The **General** page is an overall information page for the data that will be stored in the image. The only part that can be changed on this page is the compilation title (i.e. the name used when the compilation is saved, not the image name).

The **Label** page allows you to enter both an ISO 9660 and Joliet image name (i.e. the label used when the image is mounted). This page also allows you the option of using the ISO name for Joliet so that you do not have to enter both names.

ISO labels are limited to 32 characters and can use letters A-Z, digits 0-9 and the underscore character (_). Diacritics (accents) and spaces are not supported.

Joliet labels are limited to 16 characters, but supports spaces and the Unicode character set.

The screenshot shows a dialog box with tabs for 'General', 'Label', 'ISO', 'UDF', and 'Extra'. The 'ISO' tab is active. It contains the following settings:

- File name length: ISO level 1 (maximum of 8 + 3 char: (dropdown)
- Format: Mode 1 (dropdown)
- Allow a path depth of more than 8 directories
- Allow more than 255 characters in path
- Do not add the ISO file version extension
- Do not add a '.' to files without an extension
- Use the Joliet file system
 - Allow more than 64 characters for Joliet names
- Use the Rock Ridge file system

A 'Set defaults' button is located at the bottom right of the dialog.

The **ISO** page allows you to change the type of [ISO 9660](#) file system used. Currently the options are Level 1 (8 + 3 characters) and Level 2 (31 characters).

The ISO image format can also be set here, although the default of Mode 1, is recommended for all images.

The ISO 9660 extensions that are available are:

- [Joliet](#)
- [Rock Ridge](#) (professional only)

Clicking the **Defaults** button allows you to revert any changes back to the most compatible settings.

The **UDF** page shows the UDF type used which defaults to 1.02 (the most compatible).

You can also use this page to enable/disable DVD-Video support when creating DVD-Video images (professional only).

The screenshot shows a software window with a tabbed interface. The 'Extra' tab is selected and highlighted in orange. Below the tabs, there are eight input fields arranged vertically. The 'Application' field contains the text 'Pa-software ISO image creator'. The other fields are empty.

The **Extra** page (professional only) allows you to add extra information about the image, such as:

- System identifier: Optional entry about the operating system on which the disc will be used. The maximum length is 32 characters when using the ASCII character set
- Volume set: Optional name of a set of discs to create a logical unity. The maximum length is 128 characters when using the ASCII character set
- Publisher: Optional name of the publisher of this disc. **
- Data preparer: Optional name of the person who prepared the data for this disc. **
- Application: Optional name of the application (if used) that prepared the data for this disc. **
- Copyright file: Optional copyright note. *
- Abstract file: Optional file that contains an abstract of the contents of the disc. *
- Bibliographic file: Optional file that contains bibliographic information if needed. *

Notes

Optional image information marked *:

- A file name that follows the 8 + 3 rule. The ASCII character set applies including underscore and period. The file must be placed in the root directory of the disc.

The ASCII characters used comprise of capital letters from A to Z, digits from 0 to 9, and an underscore ("_").

Optional image information marked **:

These entries can be either:

- A string with a maximum of 128 characters of the ASCII character set.

- Or a file name. The file name must start with underscore ("_") and follows the 8 + 3 rule. The ASCII character set applies for the file name including underscore and period. The file must be placed in the root directory of the disc.

The ASCII characters used comprise of capital letters from A to Z, digits from 0 to 9, and an underscore ("_").

Validation and layout

Compilation validation

This is performed when a compilation (.icf file) is opened, or when the **Compilation** menu item **Refresh compilation** is selected.

When validating a compilation, each item is checked to see if the source still exists and is valid. If the source no longer exists, you are prompted to optionally remove the item.

Depending on the current [options](#), missing items can be marked with a red cross to make them stand out.

Validation is also performed with reference to the current [ISO level](#) used. If an items name exceeds the current ISO level limits or uses characters not available (apart from spaces) then (depending on the current options) a yellow alert mark is placed next to the item.

Listing invalid or missing items

From the **Compilation** menu, click **List invalid items**.

The list produced will show items that are invalid for the current ISO level, marking them with a yellow alert. The list will also show missing items, marking them with a red cross.

This gives you a quick indication of the amount of names that are invalid and the items that are missing without having to search the compilations hierarchy.

Layout

From the **Compilation** menu, click **Layout**.

The list produced shows how the current compilation will appear on the image. Items at the top of the list are at the beginning of the image, with items at the bottom appearing at the end of the image. This allows you to set items that are accessed frequently to be at the beginning for better access.

Image types

The types of images currently supported are:

ISO CD

This type of image uses by default [ISO 9660](#) level 1, mode 1, [Joliet](#) and [Rock Ridge](#), and is designed for use with 650/700MB CDs.

ISO/UDF CD

This type of image uses an [ISO/UDF bridge](#) so that the data can comply with both the UDF standard and the ISO standard. The ISO part is the same as an ISO CD.

 **Note** This will increase the size of the image by approximately 512KB.

ISO DVD

This type of image is basically the same as an [ISO](#) CD but you can not use ISO 9660 mode 2, and is designed for larger media such as DVDs.

ISO/UDF DVD

This type of image uses an [ISO/UDF bridge](#) so that the data can comply with both the UDF standard and the ISO standard. The ISO part is the same as an ISO DVD.

Video DVD (pro only)

This image type is designed for use with DVD-Video files and generates a DVD-Video compliant UDF file system. This is done by sorting the order of the content and adding padding between the files if needed.

 **Note** The sorting only works if the DVD-Video filenames include upper case characters only.

Notes

Although these types set a default structure for the destination image, they are not rigid, for example; an ISO CD is not limited to 700MB.

See [file systems](#) for more information.

File System View

Image Editor provides several ways for you to view the compilation items:

- **Original**
Original view displays your files and folders as they appear on the source. If the items are not valid for the current ISO level they are shown with a warning triangle.
- [ISO level 1](#)
ISO level 2 view displays your files and folders as they will appear on the image when using ISO 9660 Level 1 (8 + 3 characters).
- [ISO level 2](#)
ISO level 2 view displays your files and folders as they will appear on the image when using ISO 9660 Level 2 (31 characters).
- [Joliet](#)
Joliet view displays the contents of a folder with the names adjusted to fit the Joliet specification, i. e. limit to 64 characters. This is useful if some of your items have very long names.
- [UDF](#)
UDF view displays the contents of a folder with the names adjusted to fit the UDF specification, which is basically the same as the source but is limited to 255 characters.

For information on the file system view, click [here](#).

Options: General

This tab allows you to change the settings for the file browser and shell integration.

File browser options

- Show an alert when deleting items from the compilation: This prevents accidental deletions.
- Show an alert when renaming items: This prevents accidental name changes.
- Update missing items when clicked on: This allows you to get an immediate indication of the validity of the selected item.
- Show invalid ISO item names: When the name is invalid in the current ISO level, show an alert triangle next to the item.
- Show extra tool tip information: This option shows a larger tool tip with more detailed information, such as validity.
- Show large icons in tile view mode: Only available on Windows XP or newer.

Shell integration

- Add to shell context menu: This option allows you to create ISO images from the shell (Windows Explorer).
 - Create image from folder: From the context menu you can create an image from a folder, where the folder name is used for the image label, and the contents of the folder are used for the image data.
 - Create image from multiple files: The selected files and folders are passed to the Image Editor as a new compilation.
-

Item properties: General

The **General** page is an overall information page for the item that will be stored in the image.

- This tab allows you to change the name of the item and set the hidden state for the item.
 Note Hidden items can only be viewed if the target OS supports viewing hidden items.
 - It is also possible to influence the position of the file on the image by setting the items priority (or weight). Files with a higher priority can be accessed faster than items with a low priority.
 Note This option only affects files.
-

Item source properties

The source properties options allows you to view the Windows Explorer item properties.

 **Note** Changing the name of the item will invalidate the item in the compilation.

Image Editor - Command line support (Professional version only)

The **Image Editor** command line support allows you to create images via the **Command prompt** or within scripts and batch files.

 **Note** The created image will be labelled with the name of the folder.

To create an image:

1. Start the Command prompt: On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
2. In command prompt window enter:
`ImageEditor.exe <source folder>`

 **Note**

Quotes must be used when using folder names with spaces.

File systems

In computing, a **file system** is a method for storing and organising computer files and the data they contain to make it easy to find and access them. File systems may use a storage device such as a hard disk or CD-ROM and involve maintaining the physical location of the files, they might provide access to data on a file server by acting as clients for a network protocol (e.g., NFS (Network File System), SMB (Server Message Block), or 9P clients), or they may be virtual and exist only as an access method for virtual data (e.g. procfs).

More formally, a file system is a set of abstract data types that are implemented for the storage, hierarchical organization, manipulation, navigation, access, and retrieval of data. File systems share much in common with database technology, but it is debatable whether a file system can be classified as a special-purpose database (DBMS).

Examples of file systems

- [ISO 9660](#)
 - [Universal Disk Format: UDF](#)
 - [Rock Ridge Interchange Protocol](#)
 - [Joliet](#)
 - [UDF/ISO Bridge](#)
 - [Hierarchical File System: HFS \(and HFS+\)](#)
 - [Hybrid: HFS/ISO9660](#)
 - File Allocation Table: FAT
 - New Technology File System: NTFS
-

ISO 9660

ISO 9660 is a standard published by the International Organisation for Standardisation (ISO) and defines a file system for CD-ROM media. It aims at supporting different computer operating systems such as Microsoft Windows, Mac OS, and systems that follow the Unix specification, so that data may be exchanged without need for interpretation.

Levels and restrictions

There are different levels to this standard.

- Level 1: File names are restricted to eight characters with a three-character extension, upper case letters, numbers and underscore; maximum depth of directories is eight.
- Level 2: File names may be up to 31 characters.
- Level 3: Files allowed to be fragmented (mainly to allow packet writing, or incremental CD recording).
- ISO 9660:1999 (Level 4): Is the latest update to the ISO 9660 standard. It improves on various restrictions imposed by the old standard, such as extending the maximum path length to 207 characters, removing the eight level maximum directory nesting limit, and removing the special meaning of the dot character in filenames. This has not seen general adoption in operating systems until around 2004, but developers are generally starting to catch onto the standard.

All levels restrict the names to upper case letters (A-Z), digits (0-9) and underscores ("_"). Although you can use almost any ASCII character in the names, this does not strictly conform to the ISO 9660 standard, but most operating systems that can read ISO 9660 file systems support the use of most ASCII characters as an extension.

Operating system support

Most operating systems support reading of ISO 9660 formatted discs, and most new versions support the extensions such as Rock Ridge and Joliet. Operating systems that do not support the extensions usually show the basic (non-extended) features of a plain ISO 9660 disc.

Operating systems and their support for ISO 9660 and extensions:

- DOS: access with extensions, such as MSCDEX.EXE (Microsoft CDROM Extension) or CORELCD.EXE
- Microsoft Windows 95, Windows 98, Windows ME: can read ISO 9660 Level 1, 2, 3, and Joliet
- Microsoft Windows NT 4, Windows 2000, Windows XP can read ISO 9660 Level 1, 2, 3, Joliet, and ISO 9660:1999 (Level 4)
- Linux and BSD: ISO 9660 Level 1, 2, 3, Joliet, Rock Ridge, and ISO 9660:1999 (Level 4)
- Mac OS 7 to 9: ISO Level 1, 2. Optional free software supports Rock Ridge and Joliet (including ISO Level 3): Joke Ridge and Joliet Volume Access.
- Mac OS X 10.2 Jaguar, 10.3 Panther, 10.4 Tiger: ISO Level 1, 2, Joliet and Rock Ridge Extensions. Level 3 is not currently supported, although some users have been able to mount these disks by issuing a command via the Terminal.



Joliet

Joliet is the name of an extension to the [ISO 9660 file system](#). It has been most heavily endorsed by Microsoft and has been supported by all versions of its Windows OS since Windows 95 and Windows NT. Its primary focus is the relaxation of the filename restrictions inherent with full ISO 9660 compliance.

Joliet accomplishes this by supplying an additional set of filenames (up to 64 Unicode characters in length) to be encoded in UCS-2. These filenames are stored in a special supplementary header that is safely ignored on non-Joliet systems, thus preserving backward compatibility.

Official operating system support is provided only with Microsoft Windows, Linux and FreeBSD. Most disc-creation software creates both Joliet and Rock Ridge extensions on the disc, thus allowing files to appear to have the same characteristics where one or the other extension is not supported.

Rock Ridge

The **Rock Ridge Interchange Protocol** (RRIP, IEEE P1282) is an extension to the [ISO 9660](#) volume format which adds POSIX [file system](#) semantics.

The extension adds support for storing Unix-specific file information on ISO 9660 CD-ROMs. The availability of this information allows for better integration with a local Unix file system when a mount operation is performed.

These extensions are:

- Longer file names (up to 255 characters)
- Fewer restrictions on characters allowed in filenames
- UNIX-style file modes, user ids and group ids
- Symbolic links
- Deeper directory hierarchy

Rock Ridge is named after the fictional town from the movie [Blazing Saddles](#).

UDF/ISO Bridge

The UDF/ISO bridge uses the file systems: UDF 1.02 and ISO 9660 to represent the data on the media. The advantage of using a UDF/ISO Bridge is that the data will comply with both the UDF standard and the ISO standard without the need for duplicate data.

An example of use is with DVD-Video which uses both systems to be more compatible.

Universal Disk Format

The **Universal Disk Format (UDF)** is a format specification of a [file system](#) for storing files on optical media. It is an implementation of the **ISO/IEC 13346** standard (also known as **ECMA-167**). It is considered to be a replacement of [ISO 9660](#), and today is widely used for (re)writable optical media. UDF is developed and maintained by the Optical Storage Technology Association (OSTA).

 **Note** Some users have reported that video DVDs burned on their computers in UDF version 1.5 are not compatible with their set-top video DVD players. These players seem to be only compatible with UDF version 1.02.

Revisions of the UDF format

UDF has been released in multiple revisions:

- Revision 1.02: This format is used by DVD-Video discs.
- Revision 1.50: Added support for (virtual) rewritability on CD-R/DVD-R media by introducing the VAT structure. Added sparing tables for defect management on rewritable media such as CD-RW, and DVD-RW and DVD+RW.
- Revision 2.00: Added support for Stream Files and real-time files (for DVD recording) and simplified directory management. VAT support was extended.
- Revision 2.01: Is mainly a bug fix release to UDF 2.00. Many of the UDF standard's ambiguities were resolved in version 2.01.
- Revision 2.50: Added the Metadata Partition facilitating metadata clustering and optional duplication of file system information.
- Revision 2.60: Added Pseudo OverWrite method for drives supporting pseudo overwrite capability on sequentially recordable media.

For next releases of UDF, changes are discussed in relation to using UDF on very large hard disk media, and using UDF on holographic storage media.

Operating systems support

Basic support for 1.02 is available on nearly all operating systems. The list below is an example and is not a complete list of support.

- FreeBSD 5.X (Read) 1.02, 1.50, 2.0x
- FreeBSD 6.X (Read) 1.02, 1.50, 2.0x, 2.50
- FreeBSD 7.X (Read) 1.02, 1.50, 2.0x, 2.50, 2.60
- Linux 2.4.X (Read) 1.02, 1.50
- Linux 2.6.X (Read+write) 1.02, 1.50, 2.0x, 2.50, 2.60 (write supported on HDD, DVD-RAM, DVD+RW and CD-RW from 2.6.10 onward, earlier versions support less media)
- Mac OS 9 (Read+write) 1.02, 1.50 (write only supported on DVD-RAM media)
- Mac OS X 10.4 (Read+write) 1.02, 1.50

- NetBSD 4.0 (Read) 1.02, 1.50, 2.0x, 2.50, 2.60
 - OpenBSD 3.8 (Read) 1.02, 1.50, 2.0x, 2.50, 2.60
 - IBM OS/2. Additional drivers (Read+write) 2.0x
 - Solaris 7 11/99+ (Read) 1.02, 1.50
 - Solaris 8,9,10 (Read+Write) 1.02, 1.50. Write supported "on RAM media" works on HDD partition and DVD-RAM (with suitable DVD writer).
 - Windows 98/Me (Read) 1.02
 - Windows 2000 (Read) 1.02, 1.50
 - Windows XP/2003 (Read) 1.02, 1.50, 2.0x
 - Windows Vista (Read+write) 1.02, 1.50, 2.0x, 2.50
-

HFS Hybrid

A **hybrid disc** is a disc that is simultaneously both an [ISO 9660](#) disc and an Apple disc. This allow the disc to function on a variety of computer operating systems such as Microsoft Windows, Linux and Mac OS.

A hybrid disc has an ISO 9660 primary volume descriptor, which makes it a valid ISO 9660 disc, and an Apple partition. It may also have an Apple partition map, although this is not necessary.

The ISO 9660 portion of the disc can co-exist with an Apple partition because the header areas which define the contents of the disc are located in different places. The ISO 9660 primary volume descriptor begins 32,768 bytes (32KB) into the disc. If present, an Apple partition map begins 512 bytes into the disc; if there is no partition map, the header for an Apple [HFS](#) partition (known as a Master Directory Block, or MDB) begins 1,024 bytes into the disc.

Hybrid discs are often used for distributing computer software. For example, the ISO 9660 section of the disc can hold software for the Microsoft Windows platform, while the HFS part of the disc holds Apple software. The ISO 9660 section can also contain Joliet for even more compatibility.

In a *true* (or *shared*) hybrid HFS file system, files common to both the ISO 9660 and HFS partitions are stored only once, with the ISO 9660 partition pointing to file content in the HFS area (or vice versa). In effect, the ISO 9660 and HFS areas of the disc overlap. To allow HFS to avoid Windows only files and vice versa, the required files and directories can be omitted from each of the file systems.

In non-shared hybrid discs, the ISO 9660 and HFS areas are completely separate from each other, and the content of any files common to both partitions is duplicated.

HFS/HFS+

Hierarchical File System (HFS), is a [file system](#) developed by Apple Computer for use on computers running Mac OS. Originally designed for use on floppy and hard disks, it can also be found on read-only media such as CD-ROMs. HFS is the name used by developers, but in user documentation the format is referred to as **Mac OS Standard** to differentiate it from its successor HFS Plus which is called **Mac OS Extended**.

Official operating system support is provided only with Mac OS and Mac OS X but third party drivers are available for Windows. Support is also available on Linux and BSD.

Bootable Disc Specification

The **Bootable CD Specification** is an extension to the [ISO 9660](#) CD-ROM specification. It is designed to allow a computer to boot from a CD-ROM. It was first issued in January 1995 as a joint proposal by IBM and BIOS manufacturer Phoenix Technologies and named **The EI Torito Bootable CD Specification**.

A modern PC BIOS will search for boot code on a ISO 9660 CD according to the EI Torito specification. If the CD contains bootable code, the BIOS will assign a BIOS drive number to the CD drive. The drive number assigned is either 80 (hard disk emulation), 00 (floppy disk emulation) or an arbitrary number if the BIOS should not provide emulation.

Emulation allows older operating systems to be booted off a CD, by making it appear to them as if they were booted off a hard or floppy disk. Newer operating systems do not require emulation to boot; all that is needed is an appropriate boot loader such as ISOLINUX.

If you need to boot from a CD on an old PC without an EI Torito-capable BIOS you can try Smart Boot Manager, which has a standalone EI Torito stack.

The EI Torito CD/DVD extension to ISO 9660 gained its name because its design originated in an EI Torito restaurant in Irvine, California.

Troubleshooting

This section provides information about troubleshooting with Disc Image:

- [Mounting](#)
-

Mounting

This section provides information about troubleshooting the mounting process when using Disc Image:

Mounting an image fails with the error: Could not load header for any media type

- This error is due to the image not containing the correct media descriptor header (or it is not in the correct place). This is usually due to the image not being an ISO image, or due to extra data at the beginning of the image.

For example: A .BIN image is renamed to .ISO and is mounted.

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