NAME

imcat - Concatenates multiple image files into a single image file

SYNOPSIS

imcat [*options*] *infilenames...* -outfile *outfilename*

DESCRIPTION

imcat reads in each input image file, collects the image data from each, and writes the entire set to the single, multi-image output file. The resulting output file will contain a concatenation of the data found in each of the individual input files.

The input and output image file formats may be different. The output file format must support the storage of multiple images in a single file.

OPTIONS

imcat has a variety of options in the following five categories:

File Selection	What input and output files to use
Format Selection	What image file format to use
Format Control	What variant of a file format to generate
Standard	Standard generic options for all SDSC tools

File Selection, *Format Selection*, *Format Control*, and *Standard* options are common to all SDSC image tools and are discussed in depth in the man page for imconv(1IM).

All options can be abbreviated to the first few unique characters.

Input File Names

Input file names may be given explicitly or implicitly. In an explicit list, the user gives each image file name on the command-line for imcat. The following are typical invocations of imcat using explicit file names:

```
imcat thing1.rgb thing2.hdf sam.ras i.pix. am.rla -outfile outputgroup.hdf
imcat credits0.rgb credits1.rgb credits2.rgb -outfile outcredits.tiff
imcat icons*.ico -outfile myicons.hdf
```

File names may be given implicitly by providing a file name template that contains the special character code "%d", like the C language printf(3) print format directive. This template will be used to generate a series of image file names by replacing the "%d" with integer frame numbers, one after another. The template myimage.%d.rgb, for instance, could generate the file names myimage.0.rgb, myimage.1.rgb, myimage.2.rgb, and so on.

The range of integer frame numbers used to generate input file names from a template is given using the -frames *range* option, where the *range* is a single value, or range of values, taking one of the following forms:

range	Generate file names with frame numbers of
n	*n* only (single value).
n-m	*n* through *m* (range of values).

There is no space between *n*, the dash, and *m*. Also, *n* need not be a value less than *m*.

The following are typical invocations of imcat using an implicit file name template and -frames:

```
imcat credits%d.rgb -frames 0-2 -outfile outcredits.tiff
imcat -frames 0-200 movie.%03d.ras -outfile collection.hdf
imcat -frames 200-0 movie.%03d.ras -outfile reversed.hdf
```

Implicit and explicit file naming may be combined on the same command-line, such as:

```
imcat title.rgb -frames 0-100 movie.%03d.rgb credit1.rgb copyright.rgb -outfile output.hdf
```

-frames can only be given once. If more than one implicit file name template is used on the same command-line, each use will use the same frame number range.

Image files are read in and placed into the output file in the order in which they appear on the command-line.

NOTES

Multi-image files created by imcat may be split into multiple single-image files by imsplit(1IM).

Most image file formats cannot support the storage of multiple images in the same file. This is a limitation of the file format design, not imcat. imcat will issue an error message if the selected output file format cannot support the storage of multiple images in a single file.

imformats(1IM) may be used to display a list of supported file formats and their attributes. Use -long -long on imformats(1IM) to display extensive format information that indicates which file formats support multiple image storage.

Implicit file naming is most useful when concatenating multiple images from an animation into a single, large, multi-image file. In such cases, the image files being concatenated usually include a frame number in the file name.

imcat uses the C language sprintf(3) routine to replace the file name template's "%d" with successive image frame numbers. The use of sprintf(3) means the full range of "%d" format directive syntax is available in generating input file names. While the sprintf(3) man page has full details on the "%d" print directive, the following is a summary as it applies to input file naming:

The "%d" directive has the following general syntax:

"%" [*flags*] [*digit*] ["." *precision*] "d"

The directive always starts with a "%" character and ends with a "d" character. Field names between [ ]s in the syntax above are optional. With no optional field value, the simplest form of the directive is just "%d".

flags Following the "%" is an optional set of *flags* characters:

flag	Meaning
-	Left justify the frame number. Default is right.
+	Include the sign (+ or -). Default is just -.
(blank)	Use a blank instead of a + for positive numbers.

Except for peculiar file naming, users of imcat can omit the optional *flags* portion of a print directive.

digit Following the *flags* field is an optional *digit* field that gives the field width of the number, in characters. If the number requires fewer than this minimum, it will be padded on the right or left with blanks (padding is controlled by the - *flag* above). If the number requires more than this minimum, it will be taken.
_ The *digit* field can be preceded by a 0 (zero) to cause padding to be done with leading zeroes instead of blanks. This is useful when referring to frame numbers of the form "001," "002," "003," and so on.

precision

The *digit* field may be optionally followed by a "." (period) and a *precision* number that gives the minimum number of digits for the frame number. This isn't particularly useful for users of imcat and can be skipped.

The following are a few typical "%d" directives for use in imcat:

Directive	Use in imcat
%d	No leading zeros or blanks. Generates numbers like "0," "1," "2," "3," etc.
%03d	Leading zeros to fill 3 characters, including the number. Generates numbers like "000,"
%.3d	Same effect as "%03d"

In order to concatenate the image data, imcat reads in every input image file first, before writing any of it to the output file. This can take up quite a bit of memory. If the host does not have enough memory and swap space, imcat will fail with a memory allocation error.

In general, tar(1) is a better way of maintaining multi-image files than using imcat. Multi-image files created by tar(1) can be extracted one image at a time, or in any combination, and retain the original image file names. Multi-image files created by imcat can only be extracted all at once, such as by using imsplit(1IM), and cannot retain the original file names due to limitations in the output image file formats.

tar(1) and imcat multi-image files occupy about the same amount of disk space and take about the same amount of time to be created or split apart. However, the format of tar(1) files is a fairly universal standard, whereas the few image file formats supporting storage of multiple images in one file (such as HDF) are less universal.

imcat is only provided for the relatively few situations where users need to build multi-image files for use in other existing applications. For simple storage and data management purposes, tar(1) is a more appropriate tool.

For notes regarding file format conversion and standard image tool options, see the man page on imconv(1IM).

Error messages are reported to stderr.

EXAMPLES

Concatenate 6 Silicon Graphics RGB files named single03 through single08 into a single multi-image HDF file:

```
imcat single%02d.rgb -frames 3-8 -outfile many.hdf
```

Concatenate three differently named XWD images into a single TIFF file:

```
imcat one.xwd tiger.xwd beer.xwd -outfile many.tiff
```

SEE ALSO

imsplit (1IM)

For information on SDSC's image library, see imintro(3IM).

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See the individual file format man pages for the authors of the underlying format read and write code. The names of these man pages begin with the letters "im" followed by the format name. For example, the name of the TIFF man page is imtiff. To display it, enter man imtiff.

CONTACT

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