



## ***Red Hat Enterprise Linux Release 9.2 Manual Pages on 'patch.1p' command***

**\$ man patch.1p**

PATCH(1P)                    POSIX Programmer's Manual                    PATCH(1P)

### PROLOG

This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

### NAME

patch ? apply changes to files

### SYNOPSIS

```
patch [-bINR] [-c|-e|-n|-u] [-d dir] [-D define] [-i patchfile]
      [-o outfile] [-p num] [-r rejectfile] [file]
```

### DESCRIPTION

The patch utility shall read a source (patch) file containing any of four forms of difference (diff) listings produced by the diff utility (normal, copied context, unified context, or in the style of ed) and apply those differences to a file. By default, patch shall read from the standard input.

The patch utility shall attempt to determine the type of the diff listing, unless overruled by a -c, -e, -n, or -u option.

If the patch file contains more than one patch, patch shall attempt to apply each of them as if they came from separate patch files. (In this case, the application shall ensure that the name of the patch file is determinable for each diff listing.)

## OPTIONS

The patch utility shall conform to the Base Definitions volume of POSIX.1?2017, Section 12.2, Utility Syntax Guidelines.

The following options shall be supported:

- b Save a copy of the original contents of each modified file, before the differences are applied, in a file of the same name with the suffix .orig appended to it. If the file already exists, it shall be overwritten; if multiple patches are applied to the same file, the .orig file shall be written only for the first patch. When the -o outfile option is also specified, file.orig shall not be created but, if outfile already exists, outfile.orig shall be created.
- c Interpret the patch file as a copied context difference (the output of the utility diff when the -c or -C options are specified).
- d dir Change the current directory to dir before processing as described in the EXTENDED DESCRIPTION section.
- D define Mark changes with one of the following C preprocessor constructs:

```
    #ifdef define
    ...
    #endif
    #ifndef define
    ...
    #endif
```

optionally combined with the C preprocessor construct #else. If the patched file is processed with the C preprocessor, where the macro define is defined, the output shall contain the changes from the patch file; otherwise, the output shall not contain the patches specified in the patch file.
- e Interpret the patch file as an ed script, rather than a diff script.
- i patchfile

Read the patch information from the file named by the path?  
name patchfile, rather than the standard input.

- l (The letter ell.) Cause any sequence of <blank> characters in the difference script to match any sequence of <blank> characters in the input file. Other characters shall be matched exactly.
- n Interpret the script as a normal difference.
- N Ignore patches where the differences have already been applied to the file; by default, already-applied patches shall be rejected.

-o outfile

Instead of modifying the files (specified by the file operand or the difference listings) directly, write a copy of the file referenced by each patch, with the appropriate differences applied, to outfile. Multiple patches for a single file shall be applied to the intermediate versions of the file created by any previous patches, and shall result in multiple, concatenated versions of the file being written to outfile.

- p num For all pathnames in the patch file that indicate the names of files to be patched, delete num pathname components from the beginning of each pathname. If the pathname in the patch file is absolute, any leading <slash> characters shall be considered the first component (that is, -p 1 shall remove the leading <slash> characters). Specifying -p 0 shall cause the full pathname to be used. If -p is not specified, only the basename (the final pathname component) shall be used.

- R Reverse the sense of the patch script; that is, assume that the difference script was created from the new version to the old version. The -R option cannot be used with ed scripts. The patch utility shall attempt to reverse each portion of the script before applying it. Rejected differences shall be saved in swapped format. If this option is not specified, and

until a portion of the patch file is successfully applied, patch attempts to apply each portion in its reversed sense as well as in its normal sense. If the attempt is successful, the user shall be prompted to determine whether the -R option should be set.

-r rejectfile

Override the default reject filename. In the default case, the reject file shall have the same name as the output file, with the suffix .rej appended to it; see Patch Application.

-u Interpret the patch file as a unified context difference (the output of the diff utility when the -u or -U options are specified).

## OPERANDS

The following operand shall be supported:

file A pathname of a file to patch.

## STDIN

See the INPUT FILES section.

## INPUT FILES

Input files shall be text files.

## ENVIRONMENT VARIABLES

The following environment variables shall affect the execution of patch:

LANG Provide a default value for the internationalization variables that are unset or null. (See the Base Definitions volume of POSIX.1?2017, Section 8.2, Internationalization Variables the precedence of internationalization variables used to determine the values of locale categories.)

LC\_ALL If set to a non-empty string value, override the values of all the other internationalization variables.

### LC\_COLLATE

Determine the locale for the behavior of ranges, equivalence classes, and multi-character collating elements used in the extended regular expression defined for the yesexpr locale

keyword in the LC\_MESSAGES category.

LC\_CTYPE Determine the locale for the interpretation of sequences of bytes of text data as characters (for example, single-byte as opposed to multi-byte characters in arguments and input files), and the behavior of character classes used in the extended regular expression defined for the yesexpr locale key? word in the LC\_MESSAGES category.

#### LC\_MESSAGES

Determine the locale used to process affirmative responses, and the locale used to affect the format and contents of diagnostic messages and prompts written to standard error.

NLSPATH Determine the location of message catalogs for the processing of LC\_MESSAGES.

LC\_TIME Determine the locale for recognizing the format of file time stamps written by the diff utility in a context-difference input file.

#### ASYNCHRONOUS EVENTS

Default.

#### STDOUT

Not used.

#### STDERR

The standard error shall be used for diagnostic and informational messages.

#### OUTPUT FILES

The output of the patch utility, the save files (.orig suffixes), and the reject files (.rej suffixes) shall be text files.

#### EXTENDED DESCRIPTION

A patch file may contain patching instructions for more than one file; filenames shall be determined as specified in Filename Determination.

When the -b option is specified, for each patched file, the original shall be saved in a file of the same name with the suffix .orig appended to it.

For each patched file, a reject file may also be created as noted in

Patch Application. In the absence of a -r option, the name of this file shall be formed by appending the suffix .rej to the original file name.

#### Patch File Format

The patch file shall contain zero or more lines of header information followed by one or more patches. Each patch shall contain zero or more lines of filename identification in the format produced by the -c, -C, -u, or -U options of the diff utility, and one or more sets of diff output, which are customarily called hunks.

The patch utility shall recognize the following expression in the header information:

Index: pathname

The file to be patched is named pathname.

If all lines (including headers) within a patch begin with the same leading sequence of <blank> characters, the patch utility shall remove this sequence before proceeding. Within each patch, if the type of difference is common context, the patch utility shall recognize the following expressions:

\*\*\* filename timestamp

The patches arose from filename.

--- filename timestamp

The patches should be applied to filename.

If the type of difference is unified context, the patch utility shall recognize the following expressions:

--- filename timestamp

The patches arose from filename.

+++ filename timestamp

The patches should be applied to filename.

Each hunk within a patch shall be the diff output to change a line range within the original file. The line numbers for successive hunks within a patch shall occur in ascending order.

#### Filename Determination

If no file operand is specified, patch shall perform the following

steps to determine the filename to use:

1. If the type of diff is context, the patch utility shall delete pathname components (as specified by the -p option) from the filename on the line beginning with "\*\*\*\*" (if copied context) or "---" (if unified context), then test for the existence of this file relative to the current directory (or the directory specified with the -d option). If the file exists, the patch utility shall use this filename.
2. If the type of diff is context, the patch utility shall delete the pathname components (as specified by the -p option) from the filename on the line beginning with "---" (if copied context) or "+++" (if unified context), then test for the existence of this file relative to the current directory (or the directory specified with the -d option). If the file exists, the patch utility shall use this filename.
3. If the header information contains a line beginning with the string Index:, the patch utility shall delete pathname components (as specified by the -p option) from this line, then test for the existence of this file relative to the current directory (or the directory specified with the -d option). If the file exists, the patch utility shall use this filename.
4. If an SCCS directory exists in the current directory, patch shall attempt to perform a get -e SCCS/s.filename command to retrieve an editable version of the file. If the file exists, the patch utility shall use this filename.
5. The patch utility shall write a prompt to standard output and request a filename interactively from the controlling terminal (for example, /dev/tty).

#### Patch Application

If the -c, -e, -n, or -u option is present, the patch utility shall interpret information within each hunk as a copied context difference, an edited difference, a normal difference, or a unified context difference, respectively. In the absence of any of these options, the patch utility

shall determine the type of difference based on the format of information within the hunk.

For each hunk, the patch utility shall begin to search for the place to apply the patch at the line number at the beginning of the hunk, plus or minus any offset used in applying the previous hunk. If lines matching the hunk context are not found, patch shall scan both forwards and backwards at least 1000 bytes for a set of lines that match the hunk context.

If no such place is found and it is a context difference, then another scan shall take place, ignoring the first and last line of context. If that fails, the first two and last two lines of context shall be ignored and another scan shall be made. Implementations may search more extensively for installation locations.

If no location can be found, the patch utility shall append the hunk to the reject file. A rejected hunk that is a copied context difference, an ed difference, or a normal difference shall be written in copied-context-difference format regardless of the format of the patch file.

It is implementation-defined whether a rejected hunk that is a unified context difference is written in copied-context-difference format or in unified-context-difference format. If the input was a normal or ed-style difference, the reject file may contain differences with zero lines of context. The line numbers on the hunks in the reject file may be different from the line numbers in the patch file since they shall reflect the approximate locations for the failed hunks in the new file rather than the old one.

If the type of patch is an ed diff, the implementation may accomplish the patching by invoking the ed utility.

## EXIT STATUS

The following exit values shall be returned:

- 0 Successful completion.
- 1 One or more lines were written to a reject file.
- >1 An error occurred.

## CONSEQUENCES OF ERRORS

Patches that cannot be correctly placed in the file shall be written to a reject file.

The following sections are informative.

## APPLICATION USAGE

The -R option does not work with ed scripts because there is too little information to reconstruct the reverse operation.

The -p option makes it possible to customize a patch file to local user directory structures without manually editing the patch file. For example, if the filename in the patch file was:

```
/curds/whey/src/blurfl/blurfl.c
```

Setting -p 0 gives the entire pathname unmodified; -p 1 gives:

```
curds/whey/src/blurfl/blurfl.c
```

without the leading <slash>, -p 4 gives:

```
blurfl/blurfl.c
```

and not specifying -p at all gives:

```
blurfl.c .
```

## EXAMPLES

None.

## RATIONALE

Some of the functionality in historical patch implementations was not specified. The following documents those features present in historical implementations that have not been specified.

A deleted piece of functionality was the '+' pseudo-option allowing an additional set of options and a patch file operand to be given. This was seen as being insufficiently useful to standardize.

In historical implementations, if the string "Prereq:" appeared in the header, the patch utility would search for the corresponding version information (the string specified in the header, delimited by <blank> characters or the beginning or end of a line or the file) anywhere in the original file. This was deleted as too simplistic and insufficiently trustworthy a mechanism to standardize. For example, if:

```
Prereq: 1.2
```

were in the header, the presence of a delimited 1.2 anywhere in the

file would satisfy the prerequisite.

The following options were dropped from historical implementations of patch as insufficiently useful to standardize:

- b The -b option historically provided a method for changing the name extension of the backup file from the default .orig. This option has been modified and retained in this volume of POSIX.1?2017.
- F The -F option specified the number of lines of a context diff to ignore when searching for a place to install a patch.
- f The -f option historically caused patch not to request additional information from the user.
- r The -r option historically provided a method of overriding the extension of the reject file from the default .rej.
- s The -s option historically caused patch to work silently unless an error occurred.
- x The -x option historically set internal debugging flags.

In some file system implementations, the saving of a .orig file may produce unwanted results. In the case of 12, 13, or 14-character filenames (on file systems supporting 14-character maximum filenames), the .orig file overwrites the new file. The reject file may also exceed this filename limit. It was suggested, due to some historical practice, that a <tilde> (~) suffix be used instead of .orig and some other character instead of the .rej suffix. This was rejected because it is not obvious to the user which file is which. The suffixes .orig and .rej are clearer and more understandable.

The -b option has the opposite sense in some historical implementations?do not save the .orig file. The default case here is not to save the files, making patch behave more consistently with the other standard utilities.

The -w option in early proposals was changed to -l to match historical practice.

The -N option was included because without it, a non-interactive application cannot reject previously applied patches. For example, if a user

is piping the output of diff into the patch utility, and the user only wants to patch a file to a newer version non-interactively, the -N option is required.

Changes to the -l option description were proposed to allow matching across <newline> characters in addition to just <blank> characters.

Since this is not historical practice, and since some ambiguities could result, it is suggested that future developments in this area utilize another option letter, such as -L.

The -u option of GNU patch has been added, along with support for unified context formats.

## FUTURE DIRECTIONS

None.

## SEE ALSO

diff, ed

The Base Definitions volume of POSIX.1-2017, Chapter 8, Environment Variables, Section 12.2, Utility Syntax Guidelines

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