NAME
    regcomp, regexec, regerror, regfree − POSIX regex functions

SYNOPSIS
    #include <sys/types.h>
    #include <regex.h>

    int regcomp(regex_t *_preg_**, const char ***_regex_**, int** _cflags_**);**

    int regexec(const regex_t *_preg_**, const char ***_string_**, size_t** _nmatch_**,**
        regmatch_t _pmatch[]_**, int** _eflags_**);**

    size_t regerror(int _errcode_**, const regex_t ***_preg_**, char ***_errbuf_ **,**
        size_t _errbuf_size_**);**

    void regfree(regex_t *_preg_**);**

DESCRIPTION
  POSIX regex compiling
    regcomp() is used to compile a regular expression into a form that is suitable for subsequent **regexec**()
    searches.

    regcomp() is supplied with _preg_, a pointer to a pattern buffer storage area; _regex_, a pointer to the null-ter-
    minated string and _cflags_, flags used to determine the type of compilation.

    All regular expression searching must be done via a compiled pattern buffer, thus **regexec**() must always be
    supplied with the address of a **regcomp**() initialized pattern buffer.

    cflags may be the bitwise-**or** of zero or more of the following:

    REG_EXTENDED
        Use **POSIX** Extended Regular Expression syntax when interpreting _regex_. If not set, **POSIX** Ba-
        sic Regular Expression syntax is used.

    REG_ICASE
        Do not differentiate case. Subsequent **regexec**() searches using this pattern buffer will be case in-
        sensitive.

    REG_NOSUB
        Do not report position of matches. The _nmatch_ and _pmatch_ arguments to **regexec**() are ignored if
        the pattern buffer supplied was compiled with this flag set.

    REG_NEWLINE
        Match-any-character operators don't match a newline.

        A nonmatching list ([ˆ**...**]) not containing a newline does not match a newline.

        Match-beginning-of-line operator (ˆ) matches the empty string immediately after a newline, re-
        gardless of whether _eflags_, the execution flags of **regexec**(), contains **REG_NOTBOL**.

        Match-end-of-line operator ($) matches the empty string immediately before a newline, regardless
        of whether _eflags_ contains **REG_NOTEOL**.

  POSIX regex matching
    regexec() is used to match a null-terminated string against the precompiled pattern buffer, _preg_. _nmatch_
    and _pmatch_ are used to provide information regarding the location of any matches. _eflags_ may be the bit-
    wise-**or** of one or both of **REG_NOTBOL** and **REG_NOTEOL** which cause changes in matching behav-
    ior described below.

    REG_NOTBOL
        The match-beginning-of-line operator always fails to match (but see the compilation flag
        REG_NEWLINE above). This flag may be used when different portions of a string are passed to
        regexec() and the beginning of the string should not be interpreted as the beginning of the line.

REG_NOTEOL

The match-end-of-line operator always fails to match (but see the compilation flag **REG_NEW-LINE** above).

Byte offsets

Unless **REG_NOSUB** was set for the compilation of the pattern buffer, it is possible to obtain match addressing information. *pmatch* must be dimensioned to have at least *nmatch* elements. These are filled in by **regexec**() with substring match addresses. The offsets of the subexpression starting at the *i*th open parenthesis are stored in *pmatch[i]*. The entire regular expression's match addresses are stored in *pmatch[0]*. (Note that to return the offsets of *N* subexpression matches, *nmatch* must be at least *N+1*.) Any unused structure elements will contain the value −1.

The *regmatch_t* structure which is the type of *pmatch* is defined in *<regex.h>*.

```
typedef struct {
    regoff_t rm_so;
    regoff_t rm_eo;
} regmatch_t;
```

Each *rm_so* element that is not −1 indicates the start offset of the next largest substring match within the string. The relative *rm_eo* element indicates the end offset of the match, which is the offset of the first character after the matching text.

POSIX error reporting

regerror() is used to turn the error codes that can be returned by both **regcomp**() and **regexec**() into error message strings.

regerror() is passed the error code, *errcode*, the pattern buffer, *preg*, a pointer to a character string buffer, *errbuf*, and the size of the string buffer, *errbuf_size*. It returns the size of the *errbuf* required to contain the null-terminated error message string. If both *errbuf* and *errbuf_size* are nonzero, *errbuf* is filled in with the first *errbuf_size* − *1* characters of the error message and a terminating null byte ('\0').

POSIX pattern buffer freeing

Supplying **regfree**() with a precompiled pattern buffer, *preg* will free the memory allocated to the pattern buffer by the compiling process, **regcomp**().

RETURN VALUE

regcomp() returns zero for a successful compilation or an error code for failure.

regexec() returns zero for a successful match or **REG_NOMATCH** for failure.

ERRORS

The following errors can be returned by **regcomp**():

REG_BADBR

Invalid use of back reference operator.

REG_BADPAT

Invalid use of pattern operators such as group or list.

REG_BADRPT

Invalid use of repetition operators such as using '*' as the first character.

REG_EBRACE

Un-matched brace interval operators.

REG_EBRACK

Un-matched bracket list operators.

REG_ECOLLATE

Invalid collating element.

REG_ECTYPE

Unknown character class name.

REG_EEND

Nonspecific error. This is not defined by POSIX.2.

REG_EESCAPE

Trailing backslash.

REG_EPAREN

Un-matched parenthesis group operators.

REG_ERANGE

Invalid use of the range operator; for example, the ending point of the range occurs prior to the starting point.

REG_ESIZE

Compiled regular expression requires a pattern buffer larger than 64 kB. This is not defined by POSIX.2.

REG_ESPACE

The regex routines ran out of memory.

REG_ESUBREG

Invalid back reference to a subexpression.

ATTRIBUTES

For an explanation of the terms used in this section, see **attributes**(7).

Interface	Attribute	Value
regcomp(), **regexec**()	Thread safety	MT-Safe locale
regerror()	Thread safety	MT-Safe env
regfree()	Thread safety	MT-Safe

CONFORMING TO

POSIX.1-2001, POSIX.1-2008.

SEE ALSO

grep(1), **regex**(7)

The glibc manual section, *Regular Expressions*

COLOPHON

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