NAME

floatingpoint – IEEE floating point definitions

SYNOPSIS

#include <floatingpoint.h>

DESCRIPTION

This file defines constants, types, and functions used to implement standard floating point according to ANSI/IEEE Std 754-1985. The functions are implemented in **libc**. The included header file **<sys/ieeefp.h>** defines certain types of interest to the kernel.

IEEE Rounding Modes:

fp_direction_type The type of the IEEE rounding direction mode. Note: the order of enumeration varies according to hardware.

fp_precision_type The type of the IEEE rounding precision mode, which only applies on systems that support extended precision such as machines based on the Intel 80387 FPU or the 80486.

SIGFPE handling:

sigfpe_code_type The type of a **SIGFPE** code.

sigfpe_handler_type The type of a user-definable **SIGFPE** exception handler called to handle a particular **SIGFPE** code.

SIGFPE_DEFAULT A macro indicating the default **SIGFPE** exception handling, namely to perform the exception handling specified by the user, if any, and otherwise to dump core using **abort**(3C).

SIGFPE_IGNORE A macro indicating an alternate **SIGFPE** exception handling, namely to ignore and continue execution.

SIGFPE_ABORT A macro indicating an alternate **SIGFPE** exception handling, namely to abort with a core dump.

IEEE Exception Handling:

N_IEEE_EXCEPTION The number of distinct IEEE floating-point exceptions.

fp_exception_type The type of the **N_IEEE_EXCEPTION** exceptions. Each exception is given a bit number.

fp_exception_field_type
The type intended to hold at least **N_IEEE_EXCEPTION** bits corresponding to the IEEE exceptions numbered by **fp_exception_type**. Thus **fp_inexact** corresponds to the least significant bit and **fp_invalid** to the fifth least significant bit. Note: some operations may set more than one exception.

IEEE Formats and Classification:

single; **extended**; **quadruple**
Definitions of IEEE formats.

fp_class_type An enumeration of the various classes of IEEE values and symbols.

IEEE Base Conversion:

The functions described under **floating_to_decimal**(3) and **decimal_to_floating**(3) satisfy not only the IEEE Standard, but also the stricter requirements of correct rounding for all arguments.

DECIMAL_STRING_LENGTH
The length of a **decimal_string**.

decimal_string The digit buffer in a **decimal_record**.

decimal_record The canonical form for representing an unpacked decimal floating-point number.

decimal_form The type used to specify fixed or floating binary to decimal conversion.

decimal_mode A struct that contains specifications for conversion between binary and decimal.

decimal_string_form An enumeration of possible valid character strings representing floating-point numbers, infinities, or NaNs.

FILES

/usr/include/sys/ieeefp.h

SEE ALSO

abort(3C), **decimal_to_floating**(3), **econvert**(3), **floating_to_decimal**(3), **sigfpe**(3), **string_to_decimal**(3), **strtod**(3C)