The Open Group Base Specifications Issue 7, 2018 edition
IEEE Std 1003.1-2017 (Revision of IEEE Std 1003.1-2008)
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NAME

sys/types.h — data types

SYNOPSIS

#include <sys/types.h>

DESCRIPTION

The *<sys/types.h>* header shall define at least the following types:

blkcnt_t
　　Used for file block counts.
blksize_t
　　Used for block sizes.
clock_t
　　Used for system times in clock ticks or CLOCKS_PER_SEC; see *<time.h>*.
clockid_t
　　Used for clock ID type in the clock and timer functions.
dev_t
　　Used for device IDs.
fsblkcnt_t
　　Used for file system block counts.
fsfilcnt_t
　　Used for file system file counts.
gid_t
　　Used for group IDs.
id_t
　　Used as a general identifier; can be used to contain at least a **pid_t, uid_t,** or **gid_t.**
ino_t
　　Used for file serial numbers.
key_t
　　[XSI] ⊠ Used for XSI interprocess communication. ⊠
mode_t
　　Used for some file attributes.
nlink_t
　　Used for link counts.
off_t
　　Used for file sizes.
pid_t
　　Used for process IDs and process group IDs.
pthread_attr_t
　　Used to identify a thread attribute object.
pthread_barrier_t
　　Used to identify a barrier.
pthread_barrierattr_t
　　Used to define a barrier attributes object.
pthread_cond_t
　　Used for condition variables.
pthread_condattr_t
　　Used to identify a condition attribute object.
pthread_key_t
　　Used for thread-specific data keys.
pthread_mutex_t
　　Used for mutexes.

pthread_mutexattr_t
    Used to identify a mutex attribute object.
pthread_once_t
    Used for dynamic package initialization.
pthread_rwlock_t
    Used for read-write locks.
pthread_rwlockattr_t
    Used for read-write lock attributes.
pthread_spinlock_t
    Used to identify a spin lock.
pthread_t
    Used to identify a thread.
size_t
    Used for sizes of objects.
ssize_t
    Used for a count of bytes or an error indication.
suseconds_t
    Used for time in microseconds.
time_t
    Used for time in seconds.
timer_t
    Used for timer ID returned by _timer create_().
trace_attr_t
    [_OB TRC_] ⊠▷ Used to identify a trace stream attributes object ⊠
trace_event_id_t
    [_OB TRC_] ⊠▷ Used to identify a trace event type. ⊠
trace_event_set_t
    [_OB TEF_] ⊠▷ Used to identify a trace event type set. ⊠
trace_id_t
    [_OB TRC_] ⊠▷ Used to identify a trace stream. ⊠
uid_t
    Used for user IDs.

All of the types shall be defined as arithmetic types of an appropriate length, with the
following exceptions:

pthread_attr_t
pthread_barrier_t
pthread_barrierattr_t
pthread_cond_t
pthread_condattr_t
pthread_key_t
pthread_mutex_t
pthread_mutexattr_t
pthread_once_t
pthread_rwlock_t
pthread_rwlockattr_t
pthread_spinlock_t
pthread_t
timer_t
[_OB TRC_] ⊠▷

trace_attr_t
trace_event_id_t
⊠
[_OB TEF_] ⊠▷

trace_event_set_t
⊠
[_OB TRC_] ⊠▷

trace_id_t
⊠

Additionally:

- **mode_t** shall be an integer type.

- **dev_t** shall be an integer type.

- **nlink_t**, **uid_t**, **gid_t**, and **id_t** shall be integer types.

- **blkcnt_t** and **off_t** shall be signed integer types.

- **fsblkcnt_t**, **fsfilcnt_t**, and **ino_t** shall be defined as unsigned integer types.

- **size_t** shall be an unsigned integer type.

- **blksize_t**, **pid_t**, and **ssize_t** shall be signed integer types.

- **clock_t** shall be an integer or real-floating type. [CX] ⊠ **time_t** shall be an integer type. ⧆

The type `ssize_t` shall be capable of storing values at least in the range [-1, {SSIZE_MAX}].

[XSI] ⊠ The type `suseconds_t` shall be a signed integer type capable of storing values at least in the range [-1, 1000000]. ⧆

The implementation shall support one or more programming environments in which the widths of `blksize_t, pid_t, size_t, ssize_t,` and `suseconds_t` are no greater than the width of type `long.` The names of these programming environments can be obtained using the *confstr()* function or the *getconf* utility.

There are no defined comparison or assignment operators for the following types:

```
pthread_attr_t
pthread_barrier_t
pthread_barrierattr_t
pthread_cond_t
pthread_condattr_t
pthread_mutex_t
pthread_mutexattr_t
pthread_rwlock_t
pthread_rwlockattr_t
pthread_spinlock_t
timer_t
```
[OB TRC] ⊠
```
trace_attr_t
```
⧆

The following sections are informative.

APPLICATION USAGE

None.

RATIONALE

None.

FUTURE DIRECTIONS

None.

SEE ALSO

<time.h>

XSH *confstr*

XCU *getconf*

CHANGE HISTORY

First released in Issue 1. Derived from Issue 1 of the SVID.

Issue 5

The **clockid_t** and **timer_t** types are defined for alignment with the POSIX Realtime Extension.

The types **blkcnt_t, blksize_t, fsblkcnt_t, fsfilcnt_t,** and **suseconds_t** are added.

Large File System extensions are added.

Updated for alignment with the POSIX Threads Extension.

Issue 6

The **pthread_barrier_t, pthread_barrierattr_t,** and **pthread_spinlock_t** types are added for alignment with IEEE Std 1003.1j-2000.

The margin code is changed from XSI to THR for the **pthread_rwlock_t** and **pthread_rwlockattr_t** types as Read-Write Locks have been absorbed into the POSIX Threads option. The threads types are marked THR.

IEEE Std 1003.1-2001/Cor 2-2004, item XBD/TC2/D6/26 is applied, adding **pthread_t** to the list of types that are not required to be arithmetic types, thus allowing **pthread_t** to be defined as a structure.

Issue 7

Austin Group Interpretation 1003.1-2001 #033 is applied, requiring **key_t** to be an arithmetic type.

The Trace option types are marked obsolescent.

The **clock_t** and **id_t** types are moved from the XSI option to the Base.

The **pthread_barrier_t** and **pthread_barrierattr_t** types are moved from the Barriers option to the Base.

The **pthread_spinlock_t** type is moved from the Spin Locks option to the Base.

Functionality relating to the Timers and Threads options is moved to the Base.

POSIX.1-2008, Technical Corrigendum 1, XBD/TC1-2008/0069 [210], XBD/TC1-2008/0070 [28], XBD/TC1-2008/0071 [376], XBD/TC1-2008/0072 [210], and XBD/TC1-2008/0073 [327] are applied.

POSIX.1-2008, Technical Corrigendum 2, XBD/TC2-2008/0079 [856] and XBD/TC2-2008/0080 [659] are applied.

End of informative text.

[Main Index | XBD | XSH | XCU | XRAT]