

Mutex – Summary (POSIX 2004)

OPERATION	THREAD	STATE	NORMAL	DEFAULT	ERROR CHECK	RECURSIVE
_lock/_trylock <i>Thread's first attempt</i>	ANY	Unlocked	Thread becomes the owner, return success (zero)			
_lock/trylock <i>recursive</i>	NOT OWNER	M U T E X L O C K E D	For _lock , thread will block. For _trylock , EBUSY will be returned immediately			
_lock relocking <i>recursive</i>	O W N E R		Cannot happen recursively for _lock as the 1 st attempt will block the caller. For _trylock , EBUSY will be returned immediately			
_lock relocking <i>recursive</i>			The 1 st relock attempt will cause a deadlock (hung caller), no further attempts will be possible	Undefined behavior	All relock attempts will return an error. The error code is not specified/mandated (most likely will be EDEADLK or EBUSY)	Each relock will increment the mutex counter until max is reached. If counter is max, EAGAIN may be returned
_trylock relocking <i>recursive</i>	EBUSY will be returned immediately		EBUSY will be returned immediately	EBUSY will be returned immediately		
_unlock one time or <i>recursive</i>	NOT OWNER		The 1 st attempt will release the mutex and then the thread will no longer be the owner. So for next attempts see the “Not owner” case			If counter is > zero, decrement it and if it becomes zero, means the mutex is released. If the counter is 0, then see the “Not owner” case.
			Undefined behavior			
	ANY	Unlocked	Some unspecified error will be returned; May be EPERM if the thread is not the owner			
_lock, _trylock or _unlock	ANY	Uninitialized (destroyed)	Undefined behavior (but EINVAL may be returned)			