System Timer

Interface Design Manual

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1. Documentation introduction

1.1. Documentation Purpose

The system timer interface provides a timing api interface for the application layer, and this document provides a reference for users.

1.2. References

[1].

1.3. Keywords

abbreviations, terms	explain

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2. Function overview

2.1. Timer Types

beat	interface	Priority **sync/async**		Parse
Strong beat	usr_timer	1	asynchronous	1. The parameter priority of usr_timer is 1, so that With this type of timer, the system cannot enter low power consumption 2. usr_timer is an asynchronous interface, it is registered when add The scan function will be called when the time base in the hardware timer use.
weak beat	usr_timer	0	asynchronous	1. The parameter priority of usr_timer is 0, so that With this type of timer, the low power consumption of the system will ignore the beat, Beats will not be lost, but the cycle will change 2. usr_timer is an asynchronous interface, it is registered when add The callback function of the hardware timer will be called when the time base is up. use.
normal beat sys timer		none	Synchronization	1. The system will enter low power consumption and the beat will not be lost 2. sys_timer provides the time base by the systimer thread, which belongs to the same Step interface, that is to say in which thread add the sys_timer, When the timing time base reaches the systimer thread, an event notification will be sent to the corresponding The add thread responds (the callback function is executed). 3. Pay attention to the thread response problem corresponding to timer add, do not build It is recommended to do a scan with a very short period of time in the main loop thread of the system.

2.2. Difference between timer and timerout

The difference between the sys_timer/usr_timer and sys_timerout/usr_timerout interfaces is that the callback of the timeout interface will only be done once, that is,
It is to set a future time, and when the time is up, the life cycle of the timer ends.

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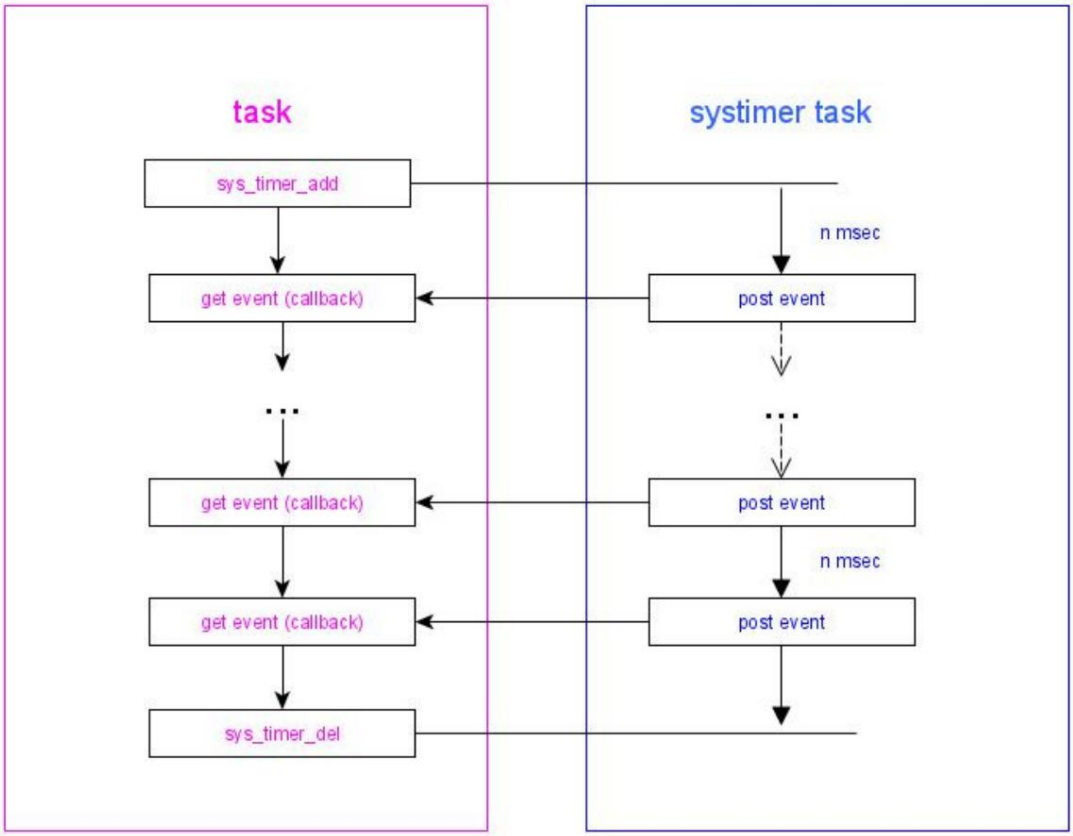
3. Process Framework

3.1. sys_timer process framework



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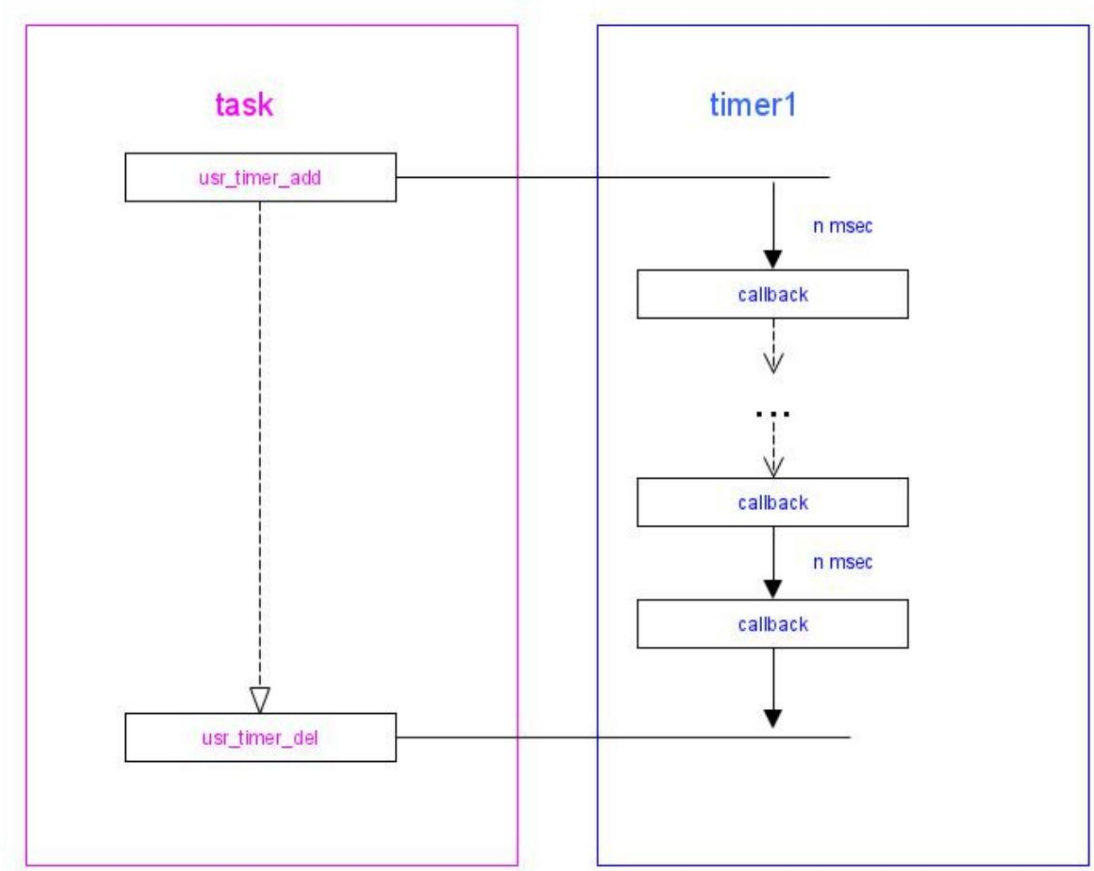
3.2. usr_timer process framework



4. Detailed interface description

4.1. sys_timer detailed interface description

```
//*--------------------------------------------------------------------------*/
/**@brief sys_timer add interface @param for regular scan
                    priv: private
                    parameter func: timing scan
                    callback function msec: timing time, unit: milliseconds
    @return The id number assigned by the timer
    @note 1. The system will enter low power consumption, and the beat will not be
                    lost. 2. sys_timer is provided by the systimer thread as a time base, which is a synchronous interface.
```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```
                That is to say, in the sys_timer of which thread is added, when the timing time base
                reaches the systimer thread, it will send an event to notify the corresponding add thread to respond (the callback
                function is executed). 3. Use in pairs with sys_timer_del
*/
/*-------------------------------------------------------------------------*/

u16 sys_timer_add(void *priv, void (*func)(void *priv), u32 msec);

//*-------------------------------------------------------------------------*/
/**@brief sys_timer regularly scans and deletes the
    interface @param
                id: id number assigned by sys_timer_add
    @return
    @note 1. Pair with sys_timer_add
*/
/*-------------------------------------------------------------------------*/

void sys_timer_del (u16);

//*-------------------------------------------------------------------------*/
/**@brief sys_timer timeout increase interface
    @param
                priv: private
                parameter func: timing scan
                callback function msec: timing time, unit: milliseconds
    @return The id number assigned by the timer
    @note 1. The system will enter low power consumption, and the beat will not
                be lost. 2. sys_timerout is provided by the systimer thread, which belongs to the synchronous
                interface, that is, in which thread add sys_timerout, the timing time base When the systimer
                thread arrives, it will send an event to notify the corresponding add thread to respond (the callback function
                is executed) 3. The timeout callback will only be executed once 4. It is used in pairs with sys_timerout_del

*/
/*-------------------------------------------------------------------------*/

u16 sys_timeout_add(void *priv, void (*func)(void *priv), u32 msec);

//*-------------------------------------------------------------------------*/
/**@brief sys_timer timeout delete interface @param

                id: id number assigned by sys_timerout_add
```


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```
    @return
    @note 1. Pair with sys_timerout_add
*/
/*----------------------------------------------------------------------------*/

void sys_timeout_del(u16);

//*---------------------------------------------------------- ----------------------------*/ /**@brief
sys_timer timer reset @param

                id: id number assigned by sys_timer
    @return
    @note 1. Re-time after reset
*/
/*----------------------------------------------------------------------------*/

void sys_timer_re_run(u16 id);

//*---------------------------------------------------------- ----------------------------*/ /**@brief
sys_timer timer setting private parameter @param

                id: id number assigned by sys_timer
                priv: private parameter
    @return
    @note
*/
/*----------------------------------------------------------------------------*/

void sys_timer_set_user_data(u16 id, void *priv);

//*----------------------------------------------------------------------------*/
/**@brief sys_timer timer gets private parameter @param

                id: The id number assigned by
    sys_timer @return Returns the private
    parameter when adding @note Note: If the private parameter is reset through sys_timer_set_user_data, the set private parameter will be returned
*/
/*----------------------------------------------------------------------------*/
```


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```
void *sys_timer_get_user_data(u16 id);
```

4.2. usr_timer detailed interface description

illustrate:

1. usr_timer is declared in include_lib/system/timer.h 2. sys_hi_timer is equivalent to usr_timer with priority 1, defined by macro in include_lib/system/timer.h 3. sys_s_hi_timer is equivalent to usr_timer with priority 0, in include_lib/system /timer.h is macro defined

```
//*----------------------------------------------------------------------------*/
/**@brief usr_timer Add interface @param for regular scan
                    priv: private
                    parameter func: timing scan
                    callback function msec: timing time, unit:
                    millisecond priority: priority, range: 0/1
    @return id number assigned by the timer @note
                     1. The priority of the usr_timer parameter is 1. Using this type of timer, the system cannot enter low power consumption. 2. The
                    priority of the usr_timer parameter is 0. Using this type of timer, the system will ignore the low power consumption. This beat, the beat will not
be lost, but the cycle will change to 3. usr_timer belongs to an asynchronous interface, and the scan function registered during add will be adjusted when the time
                    base in the hardware timer arrives.
use.
                    4. Corresponding to the release interface usr_timer_del
*/
/*----------------------------------------------------------------------------*/

u16 usr_timer_add(void *priv, void (*func)(void *priv), u32 msec, u8 priority);

//*------------------------------------------------------------ ----------------------------*/ /**@brief usr_timer
timeout increase interface @param
                    priv: private
                    parameter func: timeout
                    callback function msec: timing time, unit:
                    millisecond priority: priority, range: 0/1
    @return id number assigned by timer 1, parameter priority
    infringement must be investigated (priority of usr_timeout is 1, use this Class timer, the system cannot enter low power consumption @note All rights reserved,
```


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2. The parameter priority of usr_timerout is 0. Using this type of timer, the system will ignore the tick in low power consumption, and the rhythm will not be lost, but the cycle will change. 3. usr_timerout is an asynchronous interface, and the scan registered during add The function will time the time base in the hardware timer
is called.

4. Corresponding to the release interface usr_timerout_del

5. The timeout callback will only be executed once

*/

/*----------*/

u16 usr_timeout_add(void *priv, void (*func)(void *priv), u32 msec, u8 priority);

//*---------- ----------*/ /**@brief usr_timer
Modify the timing scan time interface @param

id: id number assigned when usr_timer_add

msec: Timing time, unit: milliseconds

@return

@note

*/

/*----------*/

int usr_timer_modify(u16 id, u32 msec);

//*----------*/

/**@brief usr_timerout Modify the timeout interface @param

id: id number assigned when usr_timerout_add

msec: Timing time, unit: milliseconds

@return

@note

*/

/*----------*/

int usr_timeout_modify(u16 id, u32 msec);

//*---------- ----------*/ /**@brief usr_timer
delete interface @param

id: id number assigned when usr_timer_add

@return

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```
    @note Note paired with usr_timer_add
*/
/*----------------------------------------------------------------------------*/

void usr_timer_del (u16 id);

//*----------------------------------------------------------------------------*/
/**@brief usr_timeout delete interface
    @param
                id: id number assigned when usr_timerout_add
    @return
    @note Note paired with usr_timerout_add
*/
/*----------------------------------------------------------------------------*/

void usr_timeout_del(u16 id);

//*----------------------------------------------------------------------------*/
/**@brief usr_time output debugging information
    @param

    @return
    @note 1. Available for
                debugging 2. It will output the ids of all added timers and their time (msec)
*/
/*----------------------------------------------------------------------------*/

void usr_timer_dump(void);
```


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