#### **NAME**

rpoll - callback functions for file descriptors and timers

#### **SYNOPSIS**

```
# include <rpoll.h>

typedef void (*poll_f)(int fd, int mask, void *arg);
typedef void (*timer_f)(int tid, void *arg);
int poll_register(int fd, poll_f func, void *arg, int mask);

void poll_unregister(int handle);
int poll_start_timer(u_int msecs, int repeat, timer_f func, void *arg);

void poll_stop_timer(int handle);
int poll_start_utimer(unsigned long long usecs, int repeat, timer_f func, void *arg);

void poll_dispatch(int wait);
```

### **DESCRIPTION**

Many programs need to read from several file descriptors at the same time. Typically in these programs one of **select**(3c) or **poll**(2) is used. These calls are however clumsy to use and the usage of one of these calls is probably not portable to other systems - not all systems support both calls.

The **rpoll**(l) family of functions is designed to overcome these restrictions. They support the well known and understood technique of event driven programing and, in addition to **select**(3c) and **poll**(2) also support timers.

Each event on a file descriptor or each timer event is translated into a call to a user defined callback function. These functions need to be registered. A file descriptor is registered with **poll\_register**. fd is the file descriptor to watch, mask is an event mask. It may be any combination of **POLL\_IN** to get informed when input on the file descriptor is possible, **POLL\_OUT** to get informed when output is possible or **POLL\_EXCEPT** to get informed when an exceptional condition occures. An example of an exceptional condition is the arrival of urgent data. (Note, that an end of file condition is signaled via **POLL\_IN**). *func* is the user function to be called and arg is a user supplied argument for this function. The callback functions is called with the file descriptor, a mask describing the actual events (from the

set supplied in the registration) and the user argument. **poll\_register** returns a handle, which may be used later to de-register the file descriptor. A file descriptor may be registered more than once, if the function, the user arguments or both differ in the call to **poll\_register**. If *func* and *arg* are the same, then no new registration is done, instead the event mask of the registration is changed to reflect the new mask.

A registered file descriptor may be de-registered by calling **poll\_unregister** with the handle returned by **poll\_register**.

A timer is created with **poll\_start\_timer** or **poll\_start\_utimer**. *msecs* is the number of milliseconds in **poll\_start\_utimer**, after which the timer event will be generated. If the functions use the **poll**(2) system call, then *usecs* is rounded to milliseconds and **poll\_start\_timer** is called. *repeat* selects one-short behavior (if 0) or a repeatable timer (if not 0). A one-short timer will automatically unregistered after expiry. *func* is the user function which will be called with a timer id and the user supplied *arg*. **poll\_start\_timer** and **poll\_start\_utimer** return a timer id, which may be used to cancel the timer with **poll\_stop\_timer**. A one-short timer should be canceled only if it has not yet fired.

**poll\_dispatch** must be called to actually dispatch events. *wait* is a flag, which should be 0, if only a poll should be done. In this case, the function returns, after polling the registered file descriptors and timers. If *wait* is not 0, **poll\_dispatch** waits until an event occures. All events are dispatch (i.e. callback functions called) and **poll\_dispatch returns.** 

Typical use is:

while(1)

poll\_dispatch(1);

### **SEE ALSO**

poll(2),select(3C)

## **RETURN VALUES**

**poll\_register**, **poll\_start\_timer** and **poll\_start\_utimer** return a handle which may be used to unregister the file descriptor or cancel the timer.

Both functions and **poll\_dispatch** call **xrealloc**(l) and can end in **panic**(l).

#### **ERRORS**

System call or memory allocation errors are fatal and are handle by calling **panic**(l). The one exception is a return of EINTR from **select**(3c) or **poll**(2) in **poll dispatch**. In this case **poll dispatch** simply

returns.

## **BUGS**

Obscure sequences of **poll\_start\_timer** and **poll\_stop\_timer** in callback functions may probably break the code.

The semantics of **POLL\_EXCEPT** are not clear.

# **AUTHORS**

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