

Interrupt handling and user space notification

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I have several registered interrupts assigned to gpios, and application in user space. How to notify application about occurred interrupt and which interrupt there was?

Possibly fasync is applicable for this goal, but I can find examples how to send information from interrupt handler to user space application.

It will be good if you can present some useful examples.

Thanks in advance.

linux linux-kernel linux-device-driver

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asked Oct 8 '13 at 20:24



Yuri

999 ● 2 ● 12 ● 25

1 Here's a coded [example](#) of the solution proposed by @eepp. – dinesh Oct 8 '13 at 21:30

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You don't need fancy kernel to userspace communication. A userspace application has access to GPIOs using Sysfs.

Read about it in [Documentation/gpio.txt](#).

First, export a GPIO pin like this (the actual number depends on your setup):



```
# echo 23 > /sys/class/gpio/export
```

This will export GPIO pin #23, and thus create `/sys/class/gpio/gpio23`.

Set its direction:

```
# echo in > /sys/class/gpio/gpio23/direction
```

If the hardware GPIO controller supports interrupts generation, the driver should also support it and you will see `/sys/class/gpio/gpio23/edge`. Write either `rising`, `falling` or `both` to this file to indicate the signal edge(s) that will create a "userspace interrupt". Now, to get interrupted, use the `poll(2)` system call on `/sys/class/gpio/gpio23/value`. Then, when the `poll` call unblocks, read the new value (`/sys/class/gpio/gpio23/value`), which will be `'0'` or `'1'` (ASCII).

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edited May 7 '20 at 11:57



Alexander

473 ● 5 ● 12

answered Oct 8 '13 at 21:25



eepp

6,590 ● 1 ● 34 ● 52

The main my question is: How to send notification with information from interrupt handler to user space application. I am using not only gpio interrupts. So in userspace I need to determine which interrupt occurred. If it possible, please present some examples how it can be done. Thanks... – Yuri Oct 9 '13 at 7:30

In that case, you could do the same thing that GPIO does with `poll(2)` on a custom Sysfs entry for your driver. Otherwise, check out [Netlink](#). – eepp Oct 9 '13 at 14:05

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dinesh provided a C implementation of eepp's proposed solution, which requires that the application block in poll().

0



Here is a C++ implementation which abstracts this functionality, and provides callback/interrupt functionality instead. Note the GPIO constructor which takes a callback function as an argument. This provides the capability desired by the OP.



<https://github.com/tweej/HighLatencyGPIO>

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edited Oct 8 '14 at 17:03



Alois Mahdal

9,057 ● 6 ● 46 ● 68

answered Oct 8 '14 at 13:44



tweej

838 ● 4 ● 15

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