NAME

io - I/O privilege file

SYNOPSIS

device io

```
#include <sys/types.h>
#include <sys/ioctl.h>
#include <dev/io/iodev.h>
#include <machine/iodev.h>

struct iodev_pio_req {
        u_int access;
        u_int port;
        u_int width;
        u_int val;
};
```

DESCRIPTION

The special file */dev/io* is a controlled security hole that allows a process to gain I/O privileges (which are normally reserved for kernel-internal code). This can be useful in order to write userland programs that handle some hardware directly.

The usual operations on the device are to open it via the open(2) interface and to send I/O requests to the file descriptor using the ioctl(2) syscall.

The ioctl(2) requests available for */dev/io* are mostly platform dependent, but there are also some in common between all of them. The IODEV_PIO is used by all the architectures in order to request that an I/O operation be performed. It takes a 'struct iodev_pio_req' argument that must be previously setup.

The *access* member specifies the type of operation requested. It may be:

IODEV_PIO_READ The operation is an "in" type. A value will be read from the specified port (retrieved from the *port* member) and the result will be stored in the *val* member.

IODEV_PIO_WRITE The operation is a "out" type. The value will be fetched from the *val* member and will be written out to the specified port (defined as the *port* member).

Finally, the *width* member specifies the size of the operand to be read/written, expressed in bytes.

In addition to any file access permissions on */dev/io*, the kernel enforces that only the super-user may open this device.

LEGACY

The */dev/io* interface used to be very i386 specific and worked differently. The initial implementation simply raised the *IOPL* of the current thread when open(2) was called on the device. This behaviour is retained in the current implementation as legacy support for both i386 and amd64 architectures.

SEE ALSO

close(2), i386_get_ioperm(2), i386_set_ioperm(2), ioctl(2), open(2), mem(4)

HISTORY

The **io** file appeared in FreeBSD 1.0.