NAME

openfirm - Open Firmware interface

SYNOPSIS

#include <sys/types.h>
#include <sys/ioctl.h>
#include <dev/ofw/openfirmio.h>

DESCRIPTION

The */dev/openfirm* device is an interface to the Open Firmware device tree. This interface is highly stylized. It uses ioctl(2) calls for all operations. These calls refer to the nodes in the Open Firmware device tree. The nodes are represented by package handles, which are simply integer values describing data areas. Occasionally a package handle of 0 may be used or returned instead, as described below.

The calls that only take and/or return the package handle of a node use a pointer to a *phandle_t* for this purpose. The others use a pointer to a *struct ofiocdesc* descriptor, which has the following definition:

```
struct ofiocdesc {
        phandle_t        of_nodeid;
        int              of_namelen;
        const char       *of_name;
        int              of_buflen;
        char             *of_buf;
};
```

The *of_nodeid* member is the package handle of the node that is passed in or returned. Strings are passed in via the *of_name* member of *of_namelen* length. The maximum accepted length of *of_name* is OFIOCMAXNAME. The *of_buf* member is used to return strings except for the OFIOCSET call where it is also used to pass in a string. In the latter case the maximum accepted length of *of_buf* is OFIOCMAXVALUE. Generally, *of_buf* works in a value-result fashion. At entry to the ioctl(2) call, *of_buflen* is expected to reflect the buffer size. On return, *of_buflen* is updated to reflect the buffer contents.

The following ioctl(2) calls are supported:

OFIOCGETOPTNODE Uses a *phandle_t*. Takes nothing and returns the package handle of the
                 /options node.

OFIOCGETNEXT   Uses a *phandle_t*. Takes the package handle of a node and returns the package
                 handle of the next node in the Open Firmware device tree. The node following

the last node has a package handle of 0. The node following the node with the package handle of 0 is the first node.

OFIOCGETCHILD   Uses a *phandle_t*. Takes the package handle of a node and returns the package handle of the first child of that node. This child may have siblings. These can be determined by using OFIOCGETNEXT. If the node does not have a child, a package handle of 0 is returned.

OFIOCGET   Uses a *struct ofiocdesc*. Takes the package handle of a node and the name of a property. Returns the property value and its length. If no such property is associated with that node, the length of the value is set to -1. If the named property exists but has no value, the length of the value is set to 0.

OFIOCGETPROPLEN   Uses a *struct ofiocdesc*. Takes the package handle of a node and the name of a property. Returns the length of the property value. This call is the same as OFIOCGET except that only the length of the property value is returned. It can be used to determine whether a node has a particular property or whether a property has a value without the need to provide memory for storing the value.

OFIOCSET   Uses a *struct ofiocdesc*. Takes the package handle of a node, the name of a property and a property value. Returns the property value and the length that actually have been written. The Open Firmware may choose to truncate the value if it is too long or write a valid value instead if the given value is invalid for the particular property. Therefore the returned value should be checked. The Open Firmware may also completely refuse to write the given value to the property. In this case EINVAL is returned.

OFIOCNEXTPROP   Uses a *struct ofiocdesc*. Takes the package handle of a node and the name of a property. Returns the name and the length of the next property of the node. If the property referenced by the given name is the last property of the node, ENOENT is returned.

OFIOCFINDDEVICE   Uses a *struct ofiocdesc*. Takes the name or alias name of a device node. Returns package handle of the node. If no matching node is found, ENOENT is returned.

FILES
/dev/openfirm Open Firmware interface node

DIAGNOSTICS

The following may result in rejection of an operation:

[EBADF]   The requested operation requires permissions not specified at the call to **open**().

[EINVAL]   The given package handle is not 0 and does not correspond to any valid node, or the given package handle is 0 where 0 is not allowed.

[ENAMETOOLONG]
    The given name or value exceeds the maximum allowed length of OFIOCMAXNAME and OFIOCMAXVALUE bytes respectively.

SEE ALSO
ioctl(2), ofwdump(8)

IEEE Std 1275-1994:, *IEEE Standard for Boot Firmware (Initialization Configuration) Firmware:*, *Core Requirements and Practices"*, IEEE Standards Organization, ISBN 1-55937-426-8.

HISTORY
The **openfirm** interface first appeared in NetBSD 1.6. The first FreeBSD version to include it was FreeBSD 5.0.

AUTHORS
The **openfirm** interface was ported to FreeBSD by Thomas Moestl <*tmm@FreeBSD.org*>. This manual page was written by Marius Strobl <*marius@FreeBSD.org*> based on the OpenBSD manual page for openprom(4).

CAVEATS
Due to limitations within Open Firmware itself, these functions run at elevated priority and may adversely affect system performance.

For at least the */options* node the property value passed in to the OFIOCSET call has to be null-terminated and the value length passed in has to include the terminating '\0'. However, as with the OFIOCGET call, the returned value length does not include the terminating '\0'.