

NAME

isp - Qlogic FibreChannel SCSI Host Adapters driver

SYNOPSIS

To compile this driver into the kernel, place the following lines in your kernel configuration file:

```
device scbus  
device isp  
device ispfw
```

Alternatively, to load the driver as a module at boot time, place the following lines in loader.conf(5):

```
isp_load="YES"  
ispfw_load="YES"
```

DESCRIPTION

This driver provides access to FibreChannel SCSI devices.

It supports initiator and target modes of FCP SCSI profile, utilizing Class 3 and Class 2 connections. Support is available for Public and Private loops, Point-to-Point and Fabric connections.

Supported FC-Tape functionality is highly recommended for connections to tape drives that support it. It encompasses four elements from the T-10 FCP-4 specification:

- Precise Delivery of Commands
- Confirmed Completion of FCP I/O Operations
- Retransmission of Unsuccessfully Transmitted IUs
- Task Retry Identification

Together these features allow for link level error recovery with tape devices. Without it, an initiator cannot, for instance, tell whether a tape write command that has timed out resulted in all, part or none of the data going to the tape drive. FC-Tape is automatically enabled when connecting controller that supports it to a target that supports it. It may be disabled using configuration and hint options described below.

FIRMWARE

Firmware loading is supported if the ispfw(4) module is loaded. It is strongly recommended that you

use the firmware available from `ispfw(4)` as it is the most likely to have been tested with this driver.

HARDWARE

Cards supported by the `isp` driver include:

Qlogic 2422

Optical 4Gb Fibre Channel PCI-X cards.

Qlogic 246x (aka 2432)

Optical 4Gb Fibre Channel PCIe cards.

Qlogic 256x (aka 2532)

Optical 8Gb Fibre Channel PCIe cards.

Qlogic 267x/836x (aka 2031/8031)

Optical 16Gb FC/FCoE PCIe cards.

Qlogic 2690/2692/2694 (aka 2684/2692)

Optical 16Gb Fibre Channel PCIe cards.

Qlogic 2740/2742/2764 (aka 2722/2714)

Optical 32Gb Fibre Channel PCIe cards.

Qlogic QLE2770/QLE2772 (aka 2812)

Optical 32Gb Fibre Channel PCIe cards.

Qlogic QLE2774 (aka 2814)

Optical 32Gb Fibre Channel PCIe cards.

Qlogic QLE2870/QLE2872 (aka 2812)

Optical 64Gb Fibre Channel PCIe cards.

Qlogic QLE2874 (aka 2814)

Optical 64Gb Fibre Channel PCIe cards.

CONFIGURATION OPTIONS

Target mode support for Fibre Channel adapters may be enabled with the

options `ISP_TARGET_MODE`

option.

To disable FC-Tape, use the following configuration option:

options ISP_FCTAPE_OFF

Note that even if the `ISP_FCTAPE_OFF` option is used, it may be overridden by the `fc_tape` hint described below.

BOOT OPTIONS

The following options are switchable by setting values in `/boot/device.hints`.

They are:

hint.isp.N.msi

Limit on number of Message Signaled Interrupts (MSI) to be used.

hint.isp.N.msix

Limit on number of Extended Message Signaled Interrupts (MSI-X) to be used.

hint.isp.N.fwload_disable

A hint value to disable loading of firmware `ispfw(4)`.

hint.isp.N.ignore_nvram

A hint value to ignore board NVRAM settings for. Otherwise use NVRAM settings.

hint.isp.N.full duplex

A hint value to set full duplex mode.

hint.isp.N.topology

A hint value to select topology of connection. Supported values are:

`lport` Prefer loopback and fallback to point to point.

`nport` Prefer point to point and fallback to loopback.

`lport-only` Loopback only.

`nport-only`

Point to point only.

hint.isp.N.portwnn

This should be the full 64 bit World Wide Port Name you would like to use, overriding the value

in NVRAM for the card.

hint.isp.N.nodewwn

This should be the full 64 bit World Wide Node Name you would like to use, overriding the value in NVRAM for the card.

hint.isp.N.iid

A hint to override or set the Initiator ID or Loop ID. For Fibre Channel cards in Local Loop topologies it is *strongly* recommended that you set this value to non-zero.

hint.isp.N.role

A hint to define default role for isp instance (0 -- none, 1 -- target, 2 -- initiator, 3 -- both).

hint.isp.N.debug

A hint value for a driver debug level (see the file `/usr/src/sys/dev/isp/ispvar.h` for the values).

hint.isp.N.vports

A hint to create specified number of additional virtual ports.

hint.isp.N.nofctape

Set this to 1 to disable FC-Tape operation on the given isp instance.

hint.isp.N.fctape

Set this to 1 to enable FC-Tape operation on the given isp instance for targets that support it.

SYSCTL OPTIONS

dev.isp.N.loop_down_limit

This value says how long to wait in seconds after loop has gone down before giving up and expiring all of the devices that were visible. The default is 300 seconds (5 minutes). A separate (nonadjustable) timeout is used when booting to not stop booting on lack of FC connectivity.

dev.isp.N.gone_device_time

This value says how long to wait for devices to reappear if they (temporarily) disappear due to loop or fabric events. While this timeout is running, I/O to those devices will simply be held.

dev.isp.N.use_gff_id

dev.isp.N.use_gft_id

Setting those options to 0 allows to disable use of GFF_ID and GFT_ID SNS requests during FC fabric scan. It may be useful if switch does not implement them correctly, preventing some

devices from being found. Disabling them may cause unneeded logins to ports not supporting target role or even FCP at all. The default is 1 (enabled).

dev.isp.N.wwnn

This is the readonly World Wide Node Name value for this port.

dev.isp.N.wwpn

This is the readonly World Wide Port Name value for this port.

SEE ALSO

da(4), intro(4), ispfw(4), sa(4), scsi(4), gmultipath(8)

AUTHORS

The **isp** driver was written by Matthew Jacob originally for NetBSD at NASA/Ames Research Center. Later improvement was done by Alexander Motin <mav@FreeBSD.org>.

BUGS

The driver currently ignores some NVRAM settings.