NAME

esp – ESP SCSI Host Bus Adapter Driver

SYNOPSIS

esp@*sbus-slot*,0x80000

AVAILABILITY

SBus-based systems with esp-based SCSI port and SSHA, SBE/S, FSBE/S and DSBE/S SBus SCSI Host Adapter options.

DESCRIPTION

The **esp** Host Bus Adapter driver is a SCSA compliant nexus driver that supports the Emulex family of esp SCSI chips (esp100, esp100A, esp236, fas101, fas236).

The **esp** driver supports the standard functions provided by the SCSA interface. The driver supports tagged and untagged queuing, fast SCSI (on FAS esp's only), almost unlimited transfer size (using a moving DVMA window approach), auto request sense but does not support linked commands.

CONFIGURATION

The **esp** driver can be configured by defining properties in **esp.conf** which override the global SCSI settings. Supported properties are **scsi-options, target<***n***>-scsi-options, scsi-reset-delay, scsi-watchdog-tick, scsi-tag-age-limit, scsi-initiator-id**.

target<*n***>-scsi-options** overrides the **scsi-options** property value for **target<***n***>**. **<***n***>** can vary from 0 to 7.

Refer to **scsi_hba_attach**(9F) for details.

EXAMPLES

Create a file **/kernel/drv/esp.conf** and add this line:

scsi-options=0x78;

This will disable tagged queuing, fast SCSI, and Wide mode for all **esp** instances. To disable an option for one specific **esp** (refer to **driver.conf**(4)):

```
name="esp" parent="/iommu@f,e0000000/sbus@f,e0001000/espdma@f,400000"
    reg=0xf,0x800000,40
    target1-scsi-options=0x58
    scsi-options=0x178 scsi-initiator-id = 6
```

Note that the default initiator ID in OBP is **7** and that the change to ID **6** will occur at attach time. It may be preferable to change the initiator ID in OBP.

The above would set **scsi-options** for target 1 to **0x58** and for all other targets on this SCSI bus to **0x178**. The physical pathname of the parent can be determined using the **/devices** tree or following the link of the logical device name:

```
example# ls -l /dev/rdsk/c0t3d0s0
lrwxrwxrwx   1 root   root   88 Aug 22 13:29 /dev/rdsk/c0t3d0s0 ->
../../devices/iommu@f,e0000000/sbus@f,e0001000/espdma@f,400000/esp@f,800000/sd@3,0:a,raw
```

The register property values can be determined from **prtconf**(1M) output (–**v** option):

```
        esp, instance #0
        ....
          Register Specifications:
         Bus Type=0xf, Address=0x800000, Size=40
```

FILES

/kernel/drv/esp ELF Kernel Module
/kernel/drv/esp.conf Configuration file

SEE ALSO

prtconf(1M), **driver.conf**(4), **scsi_abort**(9F), **scsi_hba_attach**(9F), **scsi_ifgetcap**(9F), **scsi_reset**(9F), **scsi_sync_pkt**(9F), **scsi_transport**(9F), **scsi_device**(9S), **scsi_extended_sense**(9S), **scsi_inquiry**(9S), **scsi_pkt**(9S),

Writing Device Drivers

ANSI Small Computer System Interface-2 (SCSI-2)

ESP Technical Manuals, QLogic Corp.

DIAGNOSTICS

The messages described below are some that may appear on the system console, as well as being logged.

This first four messages may be displayed while the **esp** driver is trying to attach. All of these messages mean that the **esp** driver was unable to attach. These messages are preceded by "esp%d", where "%d" is the instance number of the esp controller.

Device in slave-only slot, unused
The SBus device has been placed in a slave-only slot and will not be accessible; move to non-slave-only SBus slot.

Device is using a hilevel intr, unused
The device was configured with a interrupt level that cannot be used with this **esp** driver. Check the SBus device.

Unable to map registers;
Driver was unable to map device registers; check for bad hardware. Driver did not attach to device, SCSI devices will be inaccessible.

Cannot find dma controller
Driver was unable to locate a dma controller. This is an auto-configuration error.

Disabled TQ since disconnects are disabled
Tagged Queuing was disabled because disconnects were disabled in scsi-options.

Bad clock frequency- setting 20mhz, asynchronous mode
Check for bad hardware.

Sync pkt failed.
Syncing a scsi packet failed. Refer to **scsi_sync_pkt**(9F).

All tags in use!
The driver could not allocate another tag number. The target devices do not properly support Tagged Queuing.

Cannot alloc tag queue
The driver could not allocate space for tag queue.

Gross error in esp status.
The driver experienced severe SCSI bus problems. Check cables and terminator.

Spurious interrupt

The driver received an interrupt while the hardware was not interrupting.

Lost state in phasemanage
The driver is confused about the state of the SCSI bus.

Unrecoverable DMA error during selection
The DMA controller experienced host SBus problems. Check for bad hardware.

Bad sequence step (0x%x) in selection
The esp hardware reported a bad sequence step. Check for bad hardware.

Undetermined selection failure
The selection of a target failed unexpectedly. Check for bad hardware.

>2 reselection IDs on the bus
Two targets selected simultaneously which is illegal. Check for bad hardware.

Reconnect: unexpected bus free
A reconnect by a target failed. Check for bad hardware.

timeout on receiving tag msg.
Suspect target f/w failure in Tagged Queuing handling.

Parity error in tag msg
A parity error was detected in a tag message. Suspect SCSI bus problems.

Botched tag
The target supplied bad tag messages. Suspect target f/w failure in Tagged Queue handling.

Parity error in reconnect msg's
The reconnect failed because of parity errors.

Target <n> didn't disconnect after sending <message>
The target unexpectedly did not disconnect after sending <message>.

No support for multiple segs
The esp driver can only transfer contiguous data.

No dma window?
Moving the DVMA window failed unexpectedly.

No dma window on <type> operation
Moving the DVMA window failed unexpectedly.

Cannot set new dma window
Moving the DVMA window failed unexpectedly.

Unable to set new window at <address> for <type> operation
Moving the DVMA window failed unexpectedly.

Illegal dma boundary?
An attempt was made to cross a boundary that the driver could not handle.

Unwanted data out/in for Target <n>
The target went into an unexpected phase.

Spurious <name> phase from target <n>
The target went into an unexpected phase.

SCSI bus DATA IN phase parity error
The driver detected parity errors on the SCSI bus.

SCSI bus MESSAGE IN phase parity error
The driver detected parity errors on the SCSI bus.

SCSI bus STATUS phase parity error
The driver detected parity errors on the SCSI bus.

Premature end of extended message
An extended SCSI bus message did not complete. Suspect a target f/w problem.

Premature end of input message
A multibyte input message was truncated. Suspect a target f/w problem.

Input message botch
The driver is confused about messages coming from the target.

Extended message <n> is too long
The extended message send by the target is longer than expected.

<name> message <n> from Target <m> garbled
Target <m> send message <name> of value <n> which the driver did not understand.

Target <n> rejects our message <name>
Target <n> rejected a message send by the driver.

Rejecting message <name> from Target <n>
The driver rejected a message received from target <n>

Cmd dma error
The driver was unable to send out command bytes.

Target <n> refused message resend
The target did not accept a message resend.

Two byte message <name> <value> rejected
The driver does not accept this two byte message.

Unexpected Selection Attempt
An attempt was made to select this host adapter by another initiator.

Polled cmd failed (target busy)
A polled cmd failed because the target did not complete outstanding commands within a reasonable time.

Polled cmd failed
A polled command failed because of timeouts or bus errors.

Disconnected command timeout for Target <id>.<lun>
A timeout occurred while target/lun was disconnected. This is usually a target f/w problem. For tagged queuing targets, <n> commands were outstanding when the timeout was detected.

Disconnected tagged cmds (<n>) timeout for Target <id>.<lun>
A timeout occurred while target/lun was disconnected. This is usually a target

f/w problem. For tagged queuing targets, <n> commands were outstanding when the timeout was detected.

Connected command timeout for Target <id>.<lun>.
This is usually a SCSI bus problem. Check cables and termination.

Target <id>.<lun> reverting to async. mode
A data transfer hang was detected. The driver attempts to eliminate this problem by reducing the data transfer rate.

Target <id>.<lun> reducing sync. transfer rate
A data transfer hang was detected. The driver attempts to eliminate this problem by reducing the data transfer rate.

Reverting to slow SCSI cable mode
A data transfer hang was detected. The driver attempts to eliminate this problem by reducing the data transfer rate.

Reset scsi bus failed
An attempt to reset the SCSI bus failed.

External SCSI bus reset
Another initiator reset the SCSI bus.

WARNINGS

The **esp** hardware does not support Wide SCSI mode. Only FAS-type esp's support fast SCSI (10 MB/sec).

NOTES

The **esp** driver exports properties indicating per target the negotiated transfer speed **(target<n>-sync-speed)** and whether tagged queuing has been enabled **(target<n>-TQ).** The sync-speed property value is the data transfer rate in KB/sec. The target-TQ property has no value. The existence of the property indicates that tagged queuing has been enabled. Refer to **prtconf**(1M) (verbose option) for viewing the **esp** properties.

```
dma, instance #3
  Register Specifications:
    Bus Type=0x2, Address=0x81000, Size=10
  esp, instance #3
     Driver software properties:
       name <target3-TQ> length <0> -- <no value>.
       name <target3-sync-speed> length <4>
         value <0x00002710>.
       name <scsi-options> length <4>
         value <0x000003f8>.
       name <scsi-watchdog-tick> length <4>
         value <0x0000000a>.
       name <scsi-tag-age-limit> length <4>
         value <0x00000008>.
       name <scsi-reset-delay> length <4>
         value <0x00000bb8>.
```