RapidIO subsystem mport driver for IDT Tsi721 PCI Express-to-SRIO bridge.

1. Overview

This driver implements all currently defined RapidIO mport callback functions. It supports maintenance read and write operations, inbound and outbound RapidIO doorbells, inbound maintenance port-writes and RapidIO messaging.

To generate SRIO maintenance transactions this driver uses one of Tsi721 DMA channels. This mechanism provides access to larger range of hop counts and destination IDs without need for changes in outbound window translation.

RapidIO messaging support uses dedicated messaging channels for each mailbox. For inbound messages this driver uses destination ID matching to forward messages into the corresponding message queue. Messaging callbacks are implemented to be fully compatible with RIONET driver (Ethernet over RapidIO messaging services).

1. Module parameters:

- 'dbg_level'
    - This parameter allows to control amount of debug information generated by this device driver. This parameter is formed by set of This parameter can be changed bit masks that correspond to the specific functional block. For mask definitions see 'drivers/rapidio/devices/tsi721.h' This parameter can be changed dynamically. Use CONFIG_RAPIDIO_DEBUG=y to enable debug output at the top level.
- 'dma_desc_per_channel'
    - This parameter defines number of hardware buffer descriptors allocated for each registered Tsi721 DMA channel. Its default value is 128.
- 'dma_txqueue_sz'
    - DMA transactions queue size. Defines number of pending transaction requests that can be accepted by each DMA channel. Default value is 16.
- 'dma_sel'
    - DMA channel selection mask. Bitmask that defines which hardware DMA channels (0 ... 6) will be registered with DmaEngine core. If bit is set to 1, the corresponding DMA channel will be registered. DMA channels not selected by this mask will not be used by this device driver. Default value is 0x7f (use all channels).
- 'pcie_mrrs'
    - override value for PCIe Maximum Read Request Size (MRRS). This parameter gives an ability to override MRRS value set during PCIe configuration process. Tsi721 supports read request sizes up to 4096B. Value for this parameter must be set as defined by PCIe specification: 0 = 128B, 1 = 256B, 2 = 512B, 3 = 1024B, 4 = 2048B and 5 = 4096B. Default value is '-1' (= keep platform setting).
- 'mbox_sel'
    - RIO messaging MBOX selection mask. This is a bitmask that defines messaging MBOXes are managed by this device driver. Mask bits 0 - 3 correspond to MBOX0 - MBOX3. MBOX is under driver's control if the corresponding bit is set to '1'. Default value is 0x0f (= all).

2. Known problems

None.

3. DMA Engine Support

Tsi721 mport driver supports DMA data transfers between local system memory and remote RapidIO devices. This functionality is implemented according to SLAVE mode API defined by common Linux kernel DMA Engine framework.

Depending on system requirements RapidIO DMA operations can be included/excluded by setting CONFIG_RAPIDIO_DMA_ENGINE option. Tsi721 miniport driver uses seven out of eight available BDMA channels to support DMA data transfers. One BDMA channel is reserved for generation of maintenance read/write requests.

If Tsi721 mport driver have been built with RAPIDIO_DMA_ENGINE support included, this driver will accept DMA-specific module parameter:

"dma_desc_per_channel"
- defines number of hardware buffer descriptors used by each BDMA channel of Tsi721 (by default - 128).

4. Version History

1.1.0	DMA operations re-worked to support data scatter/gather lists larger than hardware buffer descriptors ring.
1.0.0	Initial driver release.

5. License