

DMA-attributes.txt
DMA attributes
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This document describes the semantics of the DMA attributes that are defined in linux/dma-attrs.h.

DMA_ATTR_WRITE_BARRIER

DMA_ATTR_WRITE_BARRIER is a (write) barrier attribute for DMA. DMA to a memory region with the DMA_ATTR_WRITE_BARRIER attribute forces all pending DMA writes to complete, and thus provides a mechanism to strictly order DMA from a device across all intervening busses and bridges. This barrier is not specific to a particular type of interconnect, it applies to the system as a whole, and so its implementation must account for the idiosyncracies of the system all the way from the DMA device to memory.

As an example of a situation where DMA_ATTR_WRITE_BARRIER would be useful, suppose that a device does a DMA write to indicate that data is ready and available in memory. The DMA of the "completion indication" could race with data DMA. Mapping the memory used for completion indications with DMA_ATTR_WRITE_BARRIER would prevent the race.

DMA_ATTR_WEAK_ORDERING

DMA_ATTR_WEAK_ORDERING specifies that reads and writes to the mapping may be weakly ordered, that is that reads and writes may pass each other.

Since it is optional for platforms to implement DMA_ATTR_WEAK_ORDERING, those that do not will simply ignore the attribute and exhibit default behavior.