

DMA

Direct Memory Access

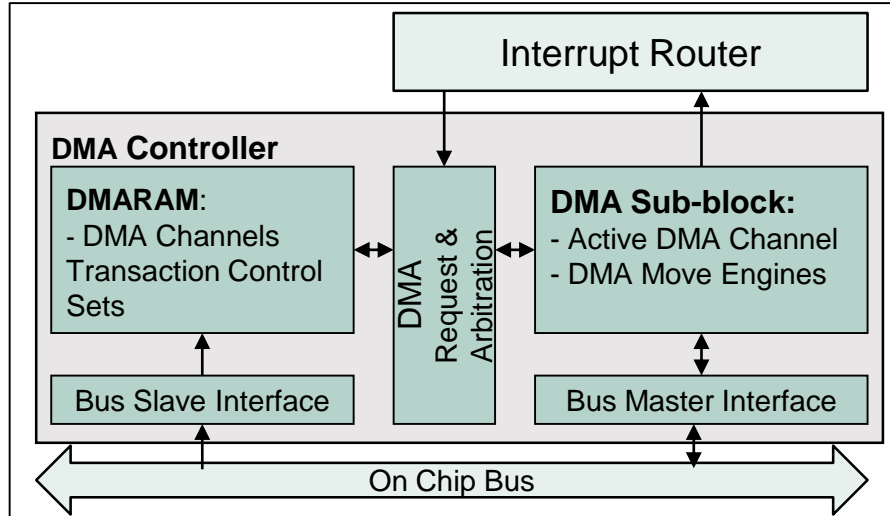
AURIX™ TC2xx Microcontroller Training
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DMA

Direct Memory Access



Highlights

- > The DMA moves data from source locations to destination locations without the intervention of the CPU or other on chip devices.
- > Up to 128 individually programmable DMA channels

Key Features

Flexible DMA channels requests

DMA double buffering

DMA linked list

Customer Benefits

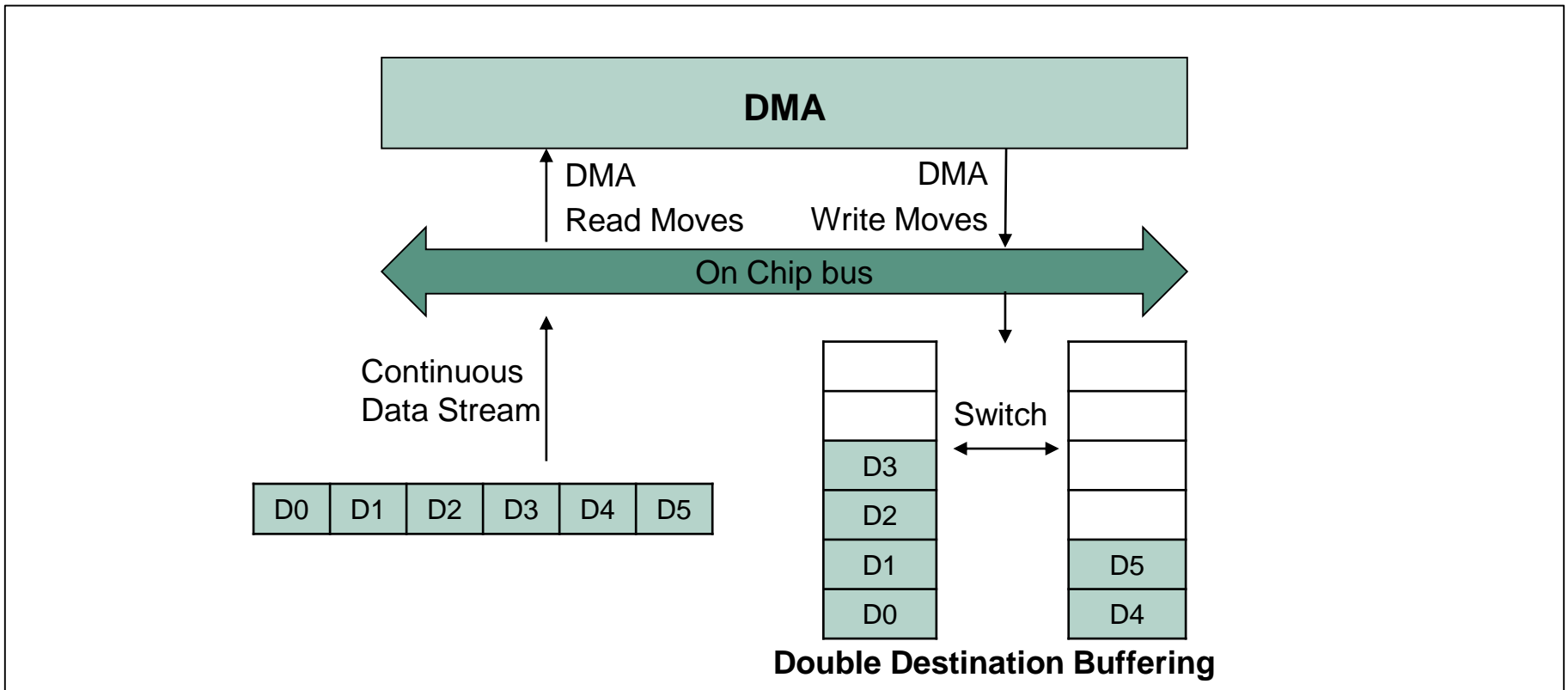
- > Possible configuration of the request type (SW, HW, Auto, ..) per DMA channel
- > Transfer continuous data stream to two destination buffers
- > Perform multi DMA transactions from non contiguous Memory regions

Flexible DMA channels requests

- › The DMA Channel supports the following types of requests:
 - **DMA Software Request:** initiated by CPU
 - **DMA Hardware Request:** Any peripheral that can trigger an interrupt can initiate a DMA transaction through the Interrupt Router
 - **DMA Daisy Chain Request:** DMA transaction initiated by the next higher priority DMA channel
 - **DMA Auto Start Request:** initiated by the loading of the next Transaction Control Set (TCS) during a DMA Linked List operation

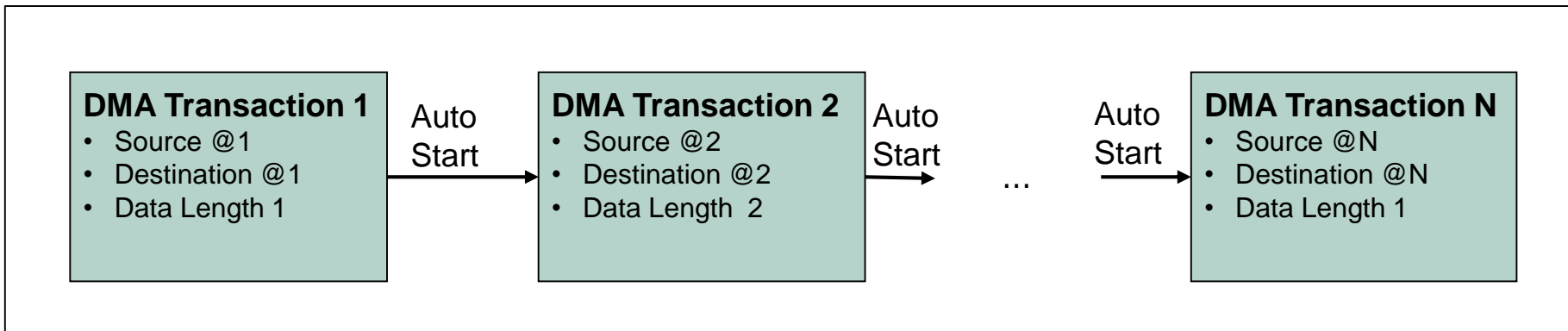
DMA double buffering

- › Double buffer could be selected for source or destination buffering
- › The application is able to freeze one of the destination buffers for cyclic software tasks while the other buffer continues to be filled



DMA linked list

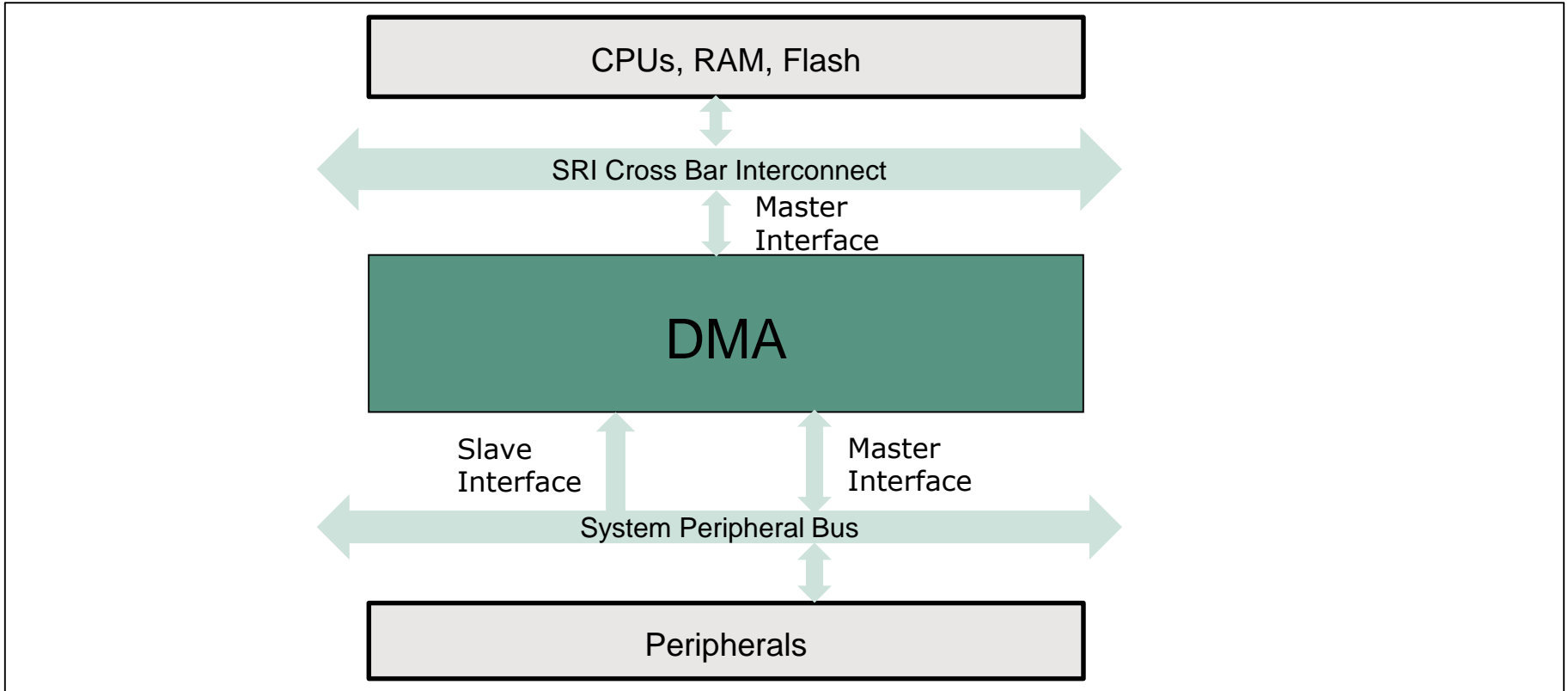
- › A linked list operation consists of a series of DMA transactions executed by **the same DMA channel**. Each DMA transaction has an unique configuration Set
- › If the Auto start request is selected, a DMA transaction will be triggered after the end of the previous one in the list → no HW or SW trigger is needed



- › DMA linked are useful when user wants to transfer data from/to non contiguous memory locations using **one** DMA channel and/or **one** service request

DMA

System integration

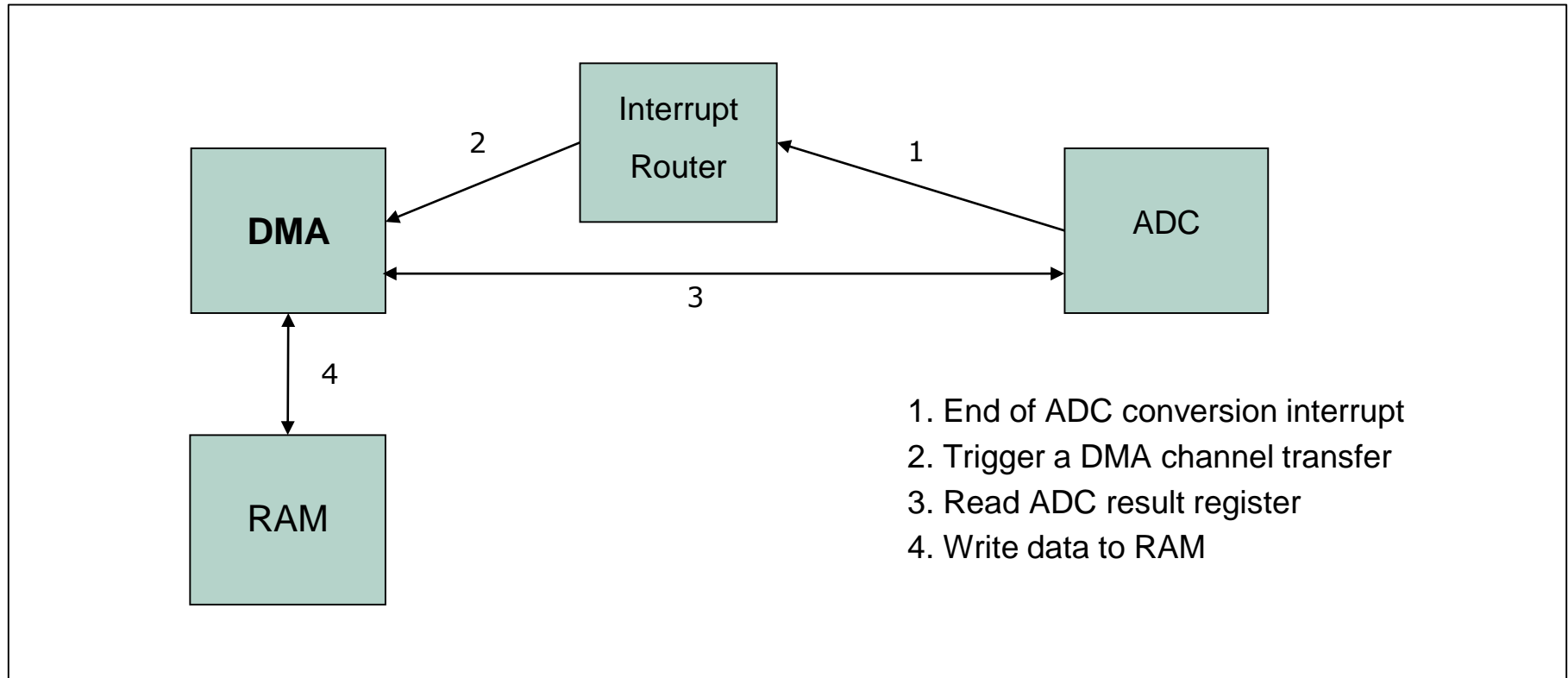


- › The DMA is connected to both SRI and SPB with master interfaces
- › This enables the DMA to read and write data from/to any module

Application example

DMA hardware requests

- › In this example, data is transferred from the ADC output registers to internal memory without any CPU intervention



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