



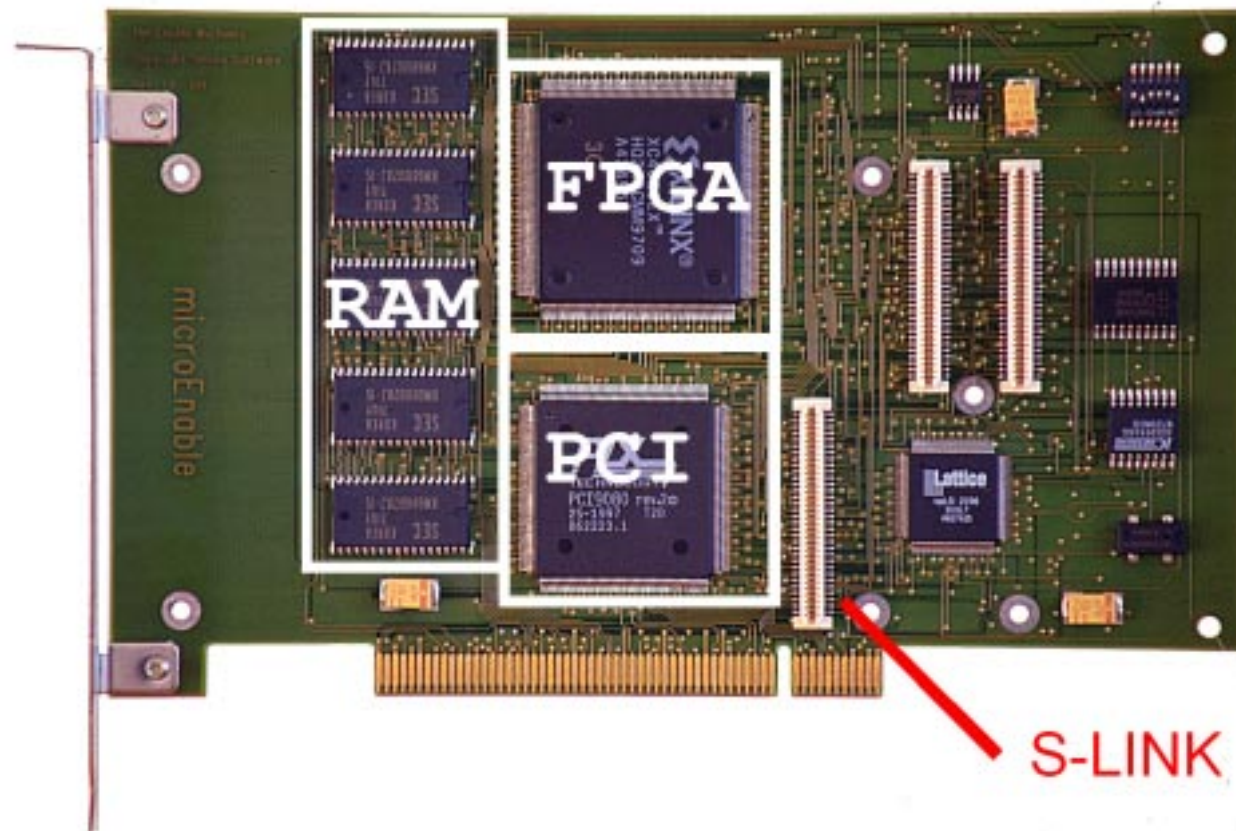
ROB-IN



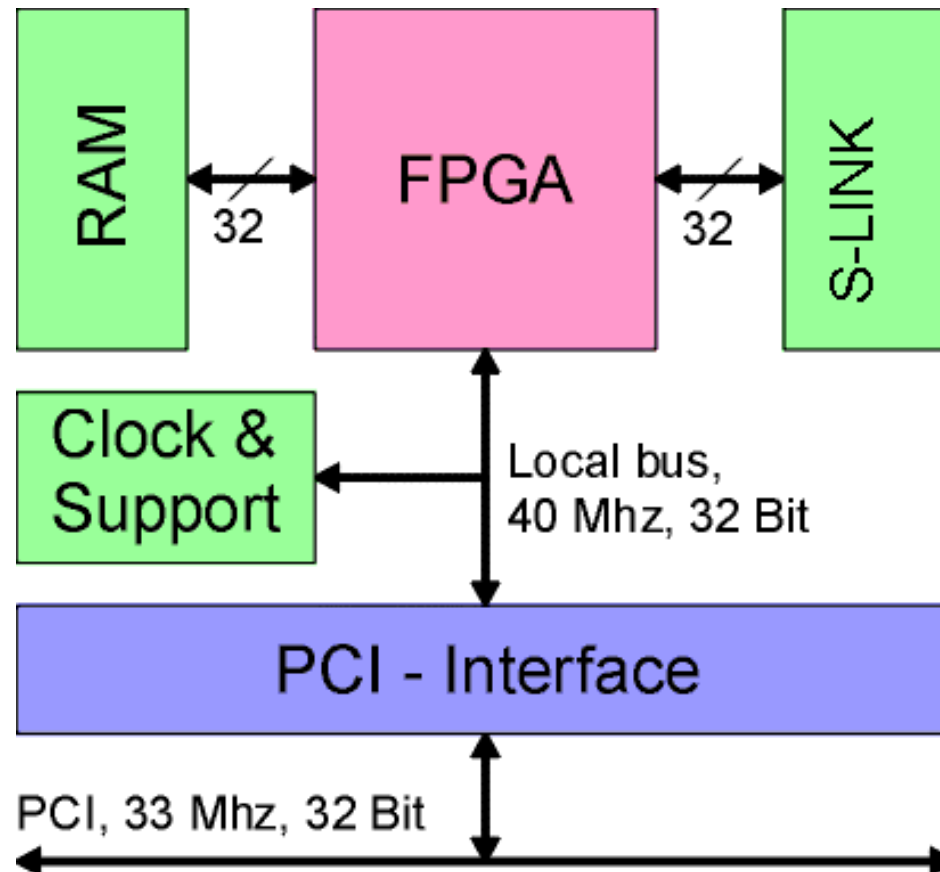
Contents

- Description of the hardware
- FPGA design
- buffermanagement
- measurements

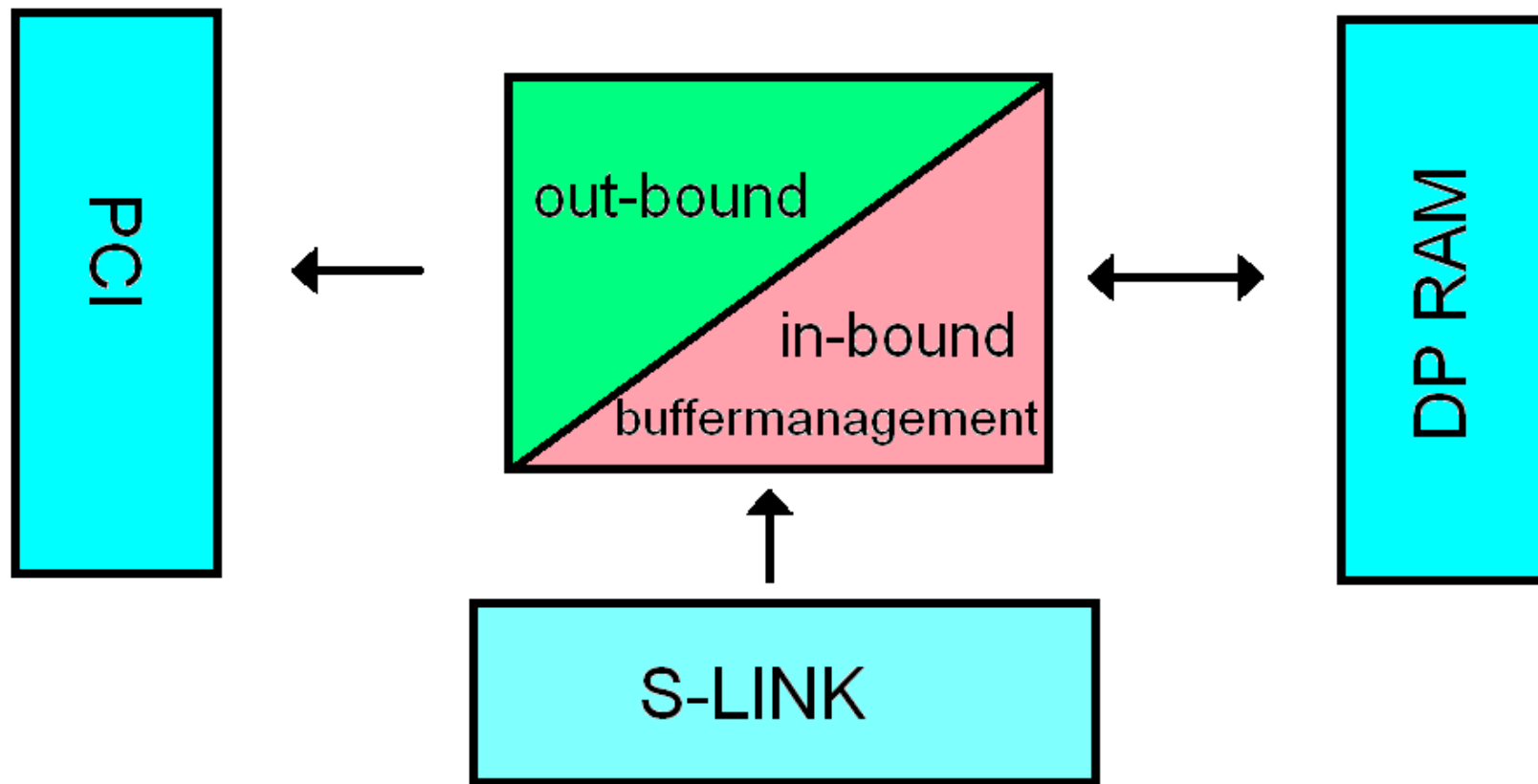
μEnable



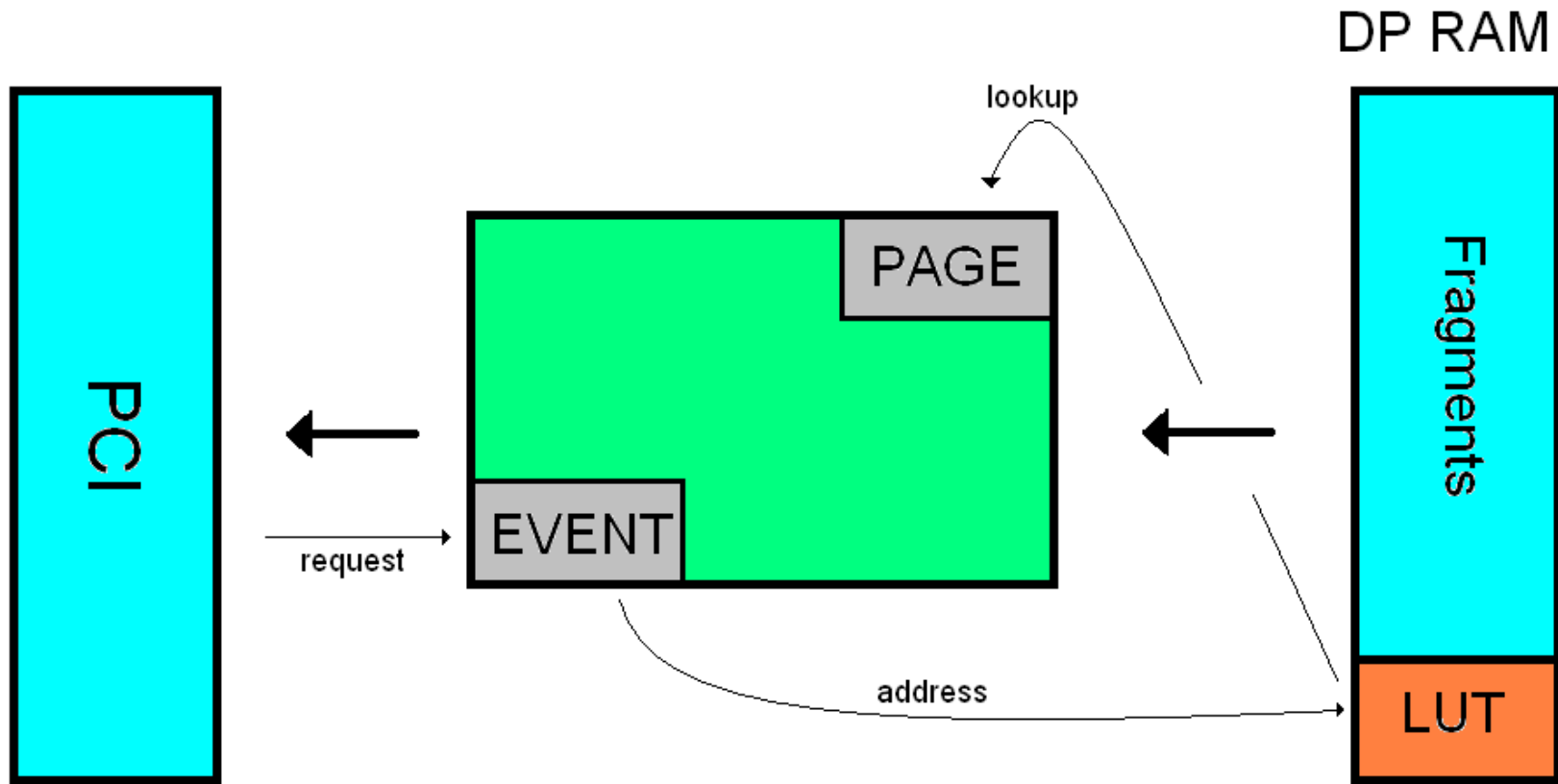
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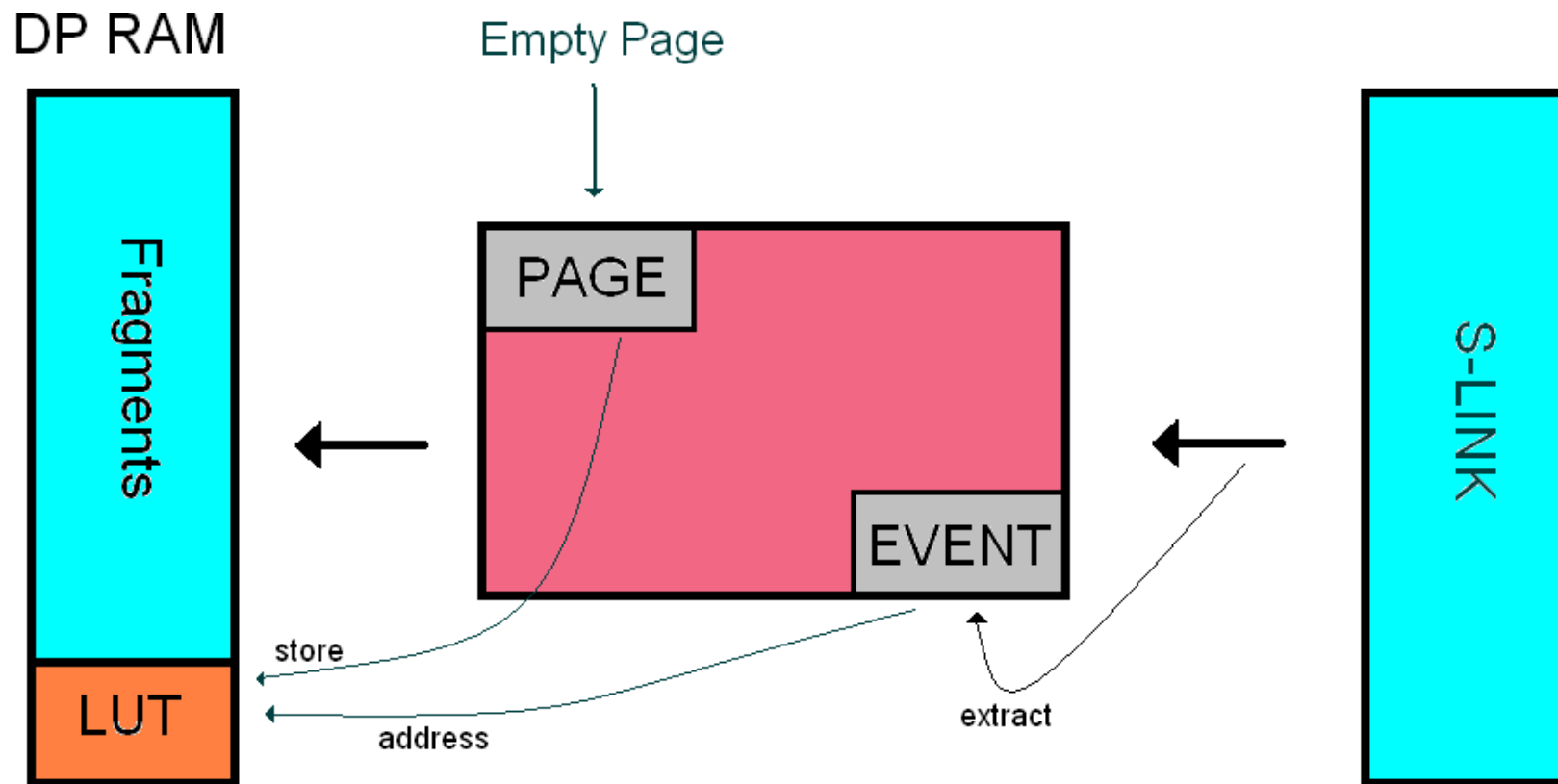
FPGA design



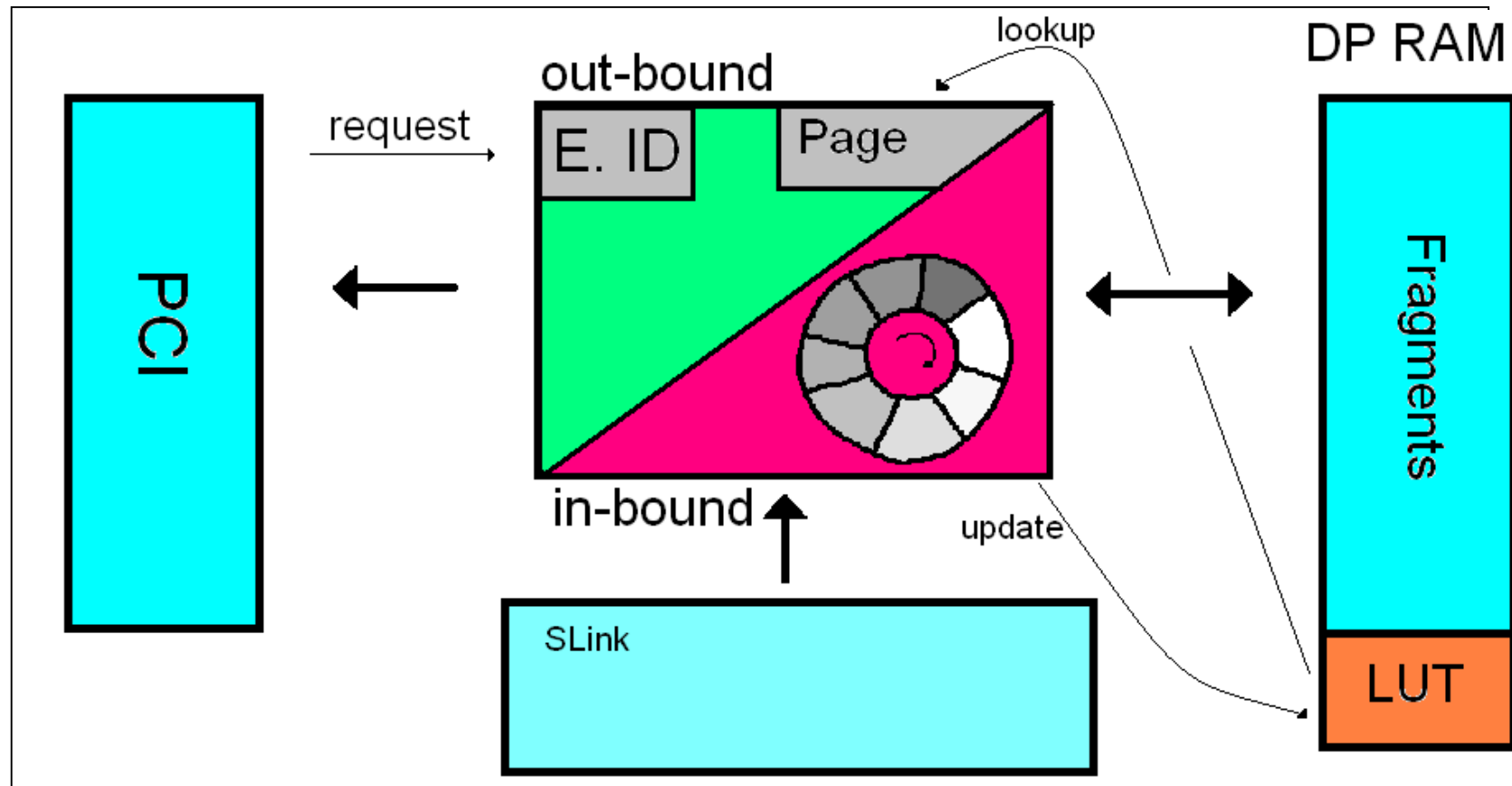
Out-bound process



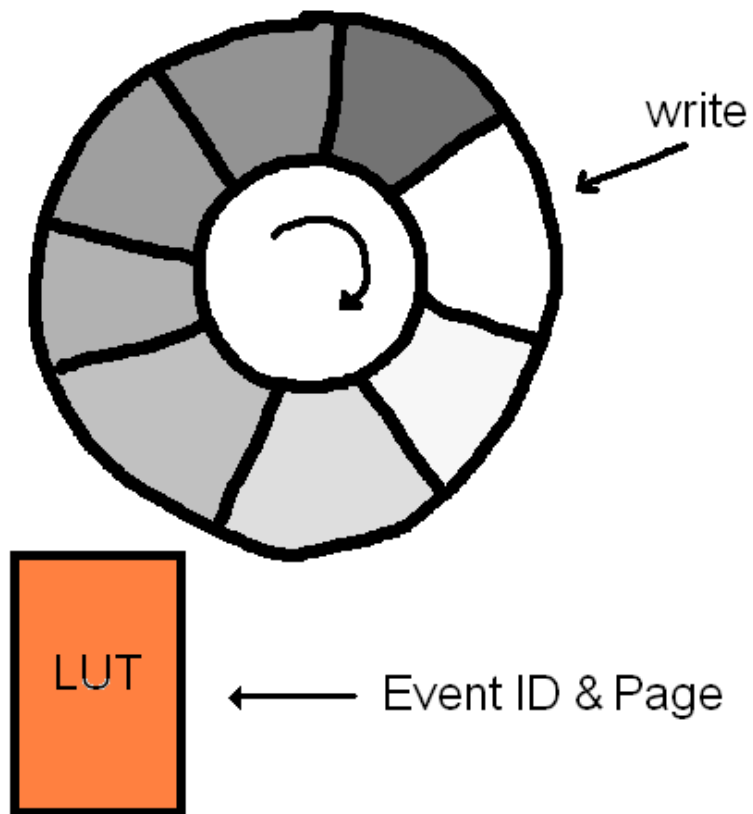
In-bound process



Current implementation

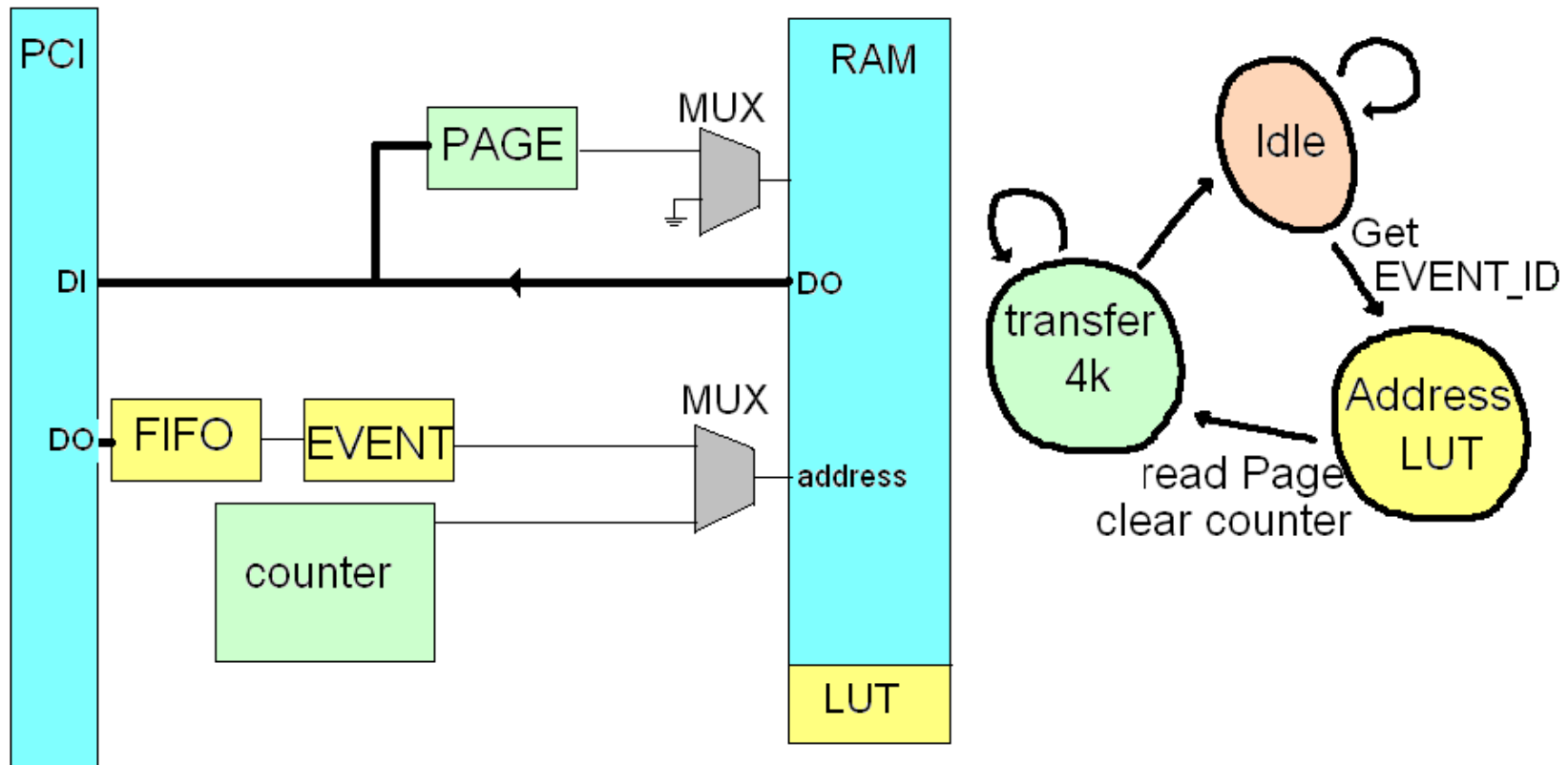


Ringbuffer

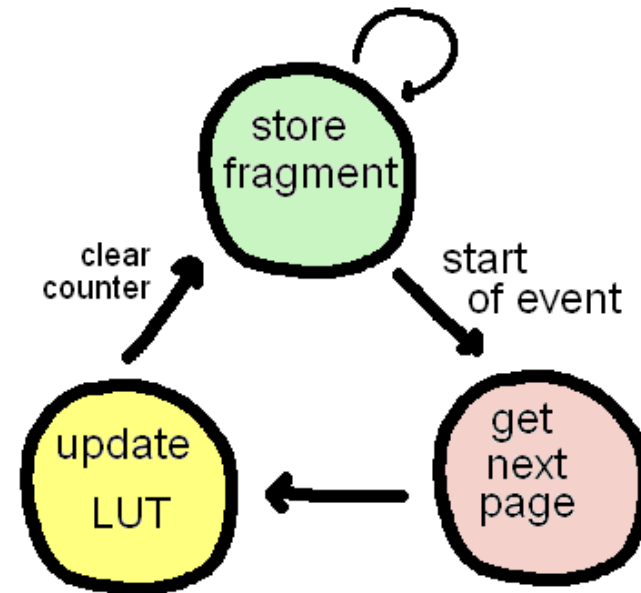
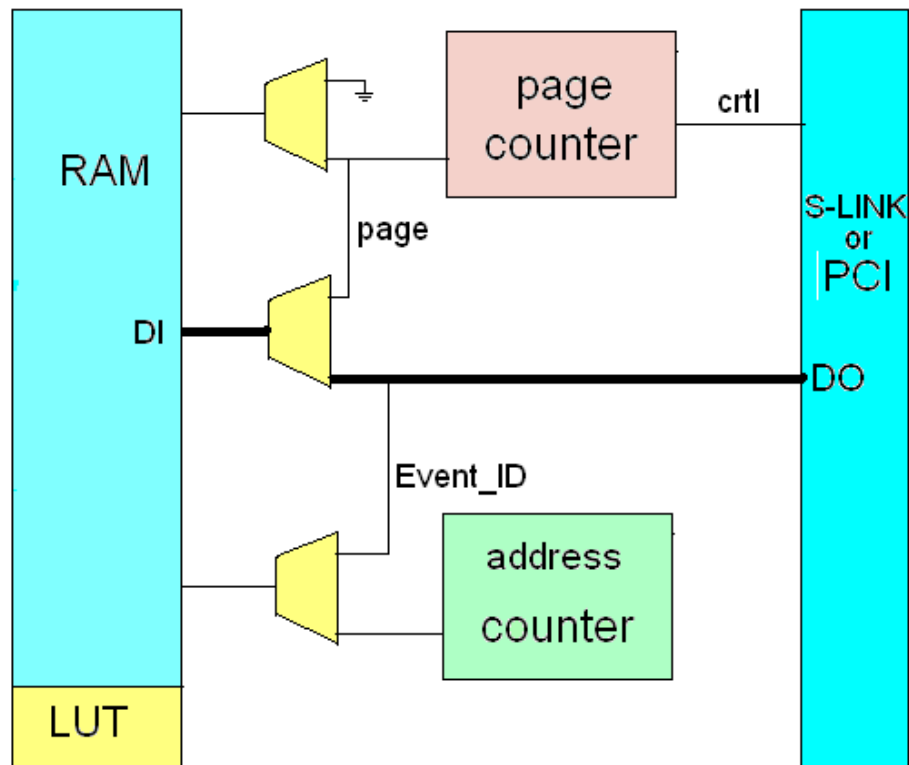


- counter for next page
- simple
- nothing to do for ROB Controller
- no forgotten fragments
- all fragments have same lifetime

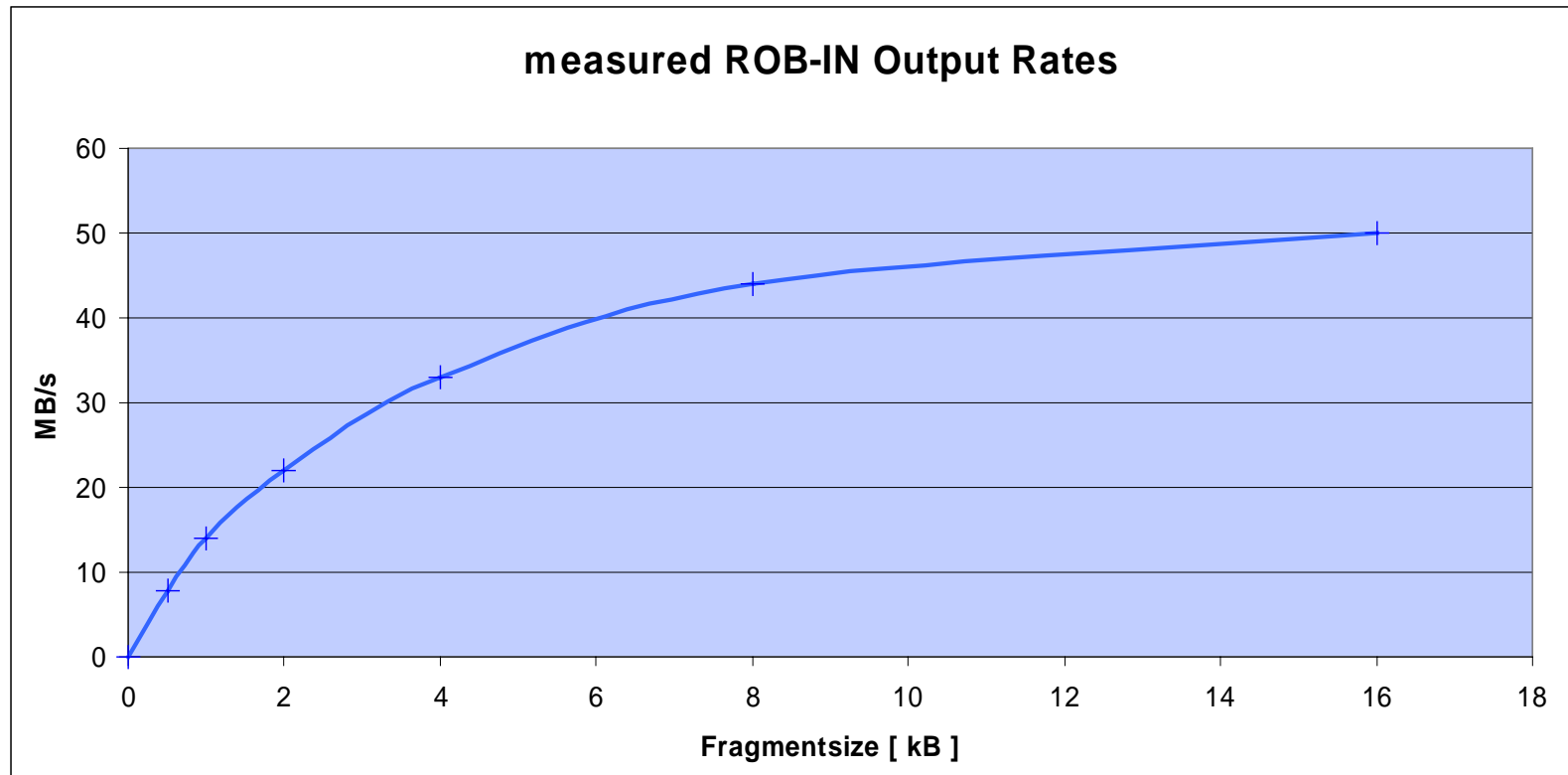
Outbound process



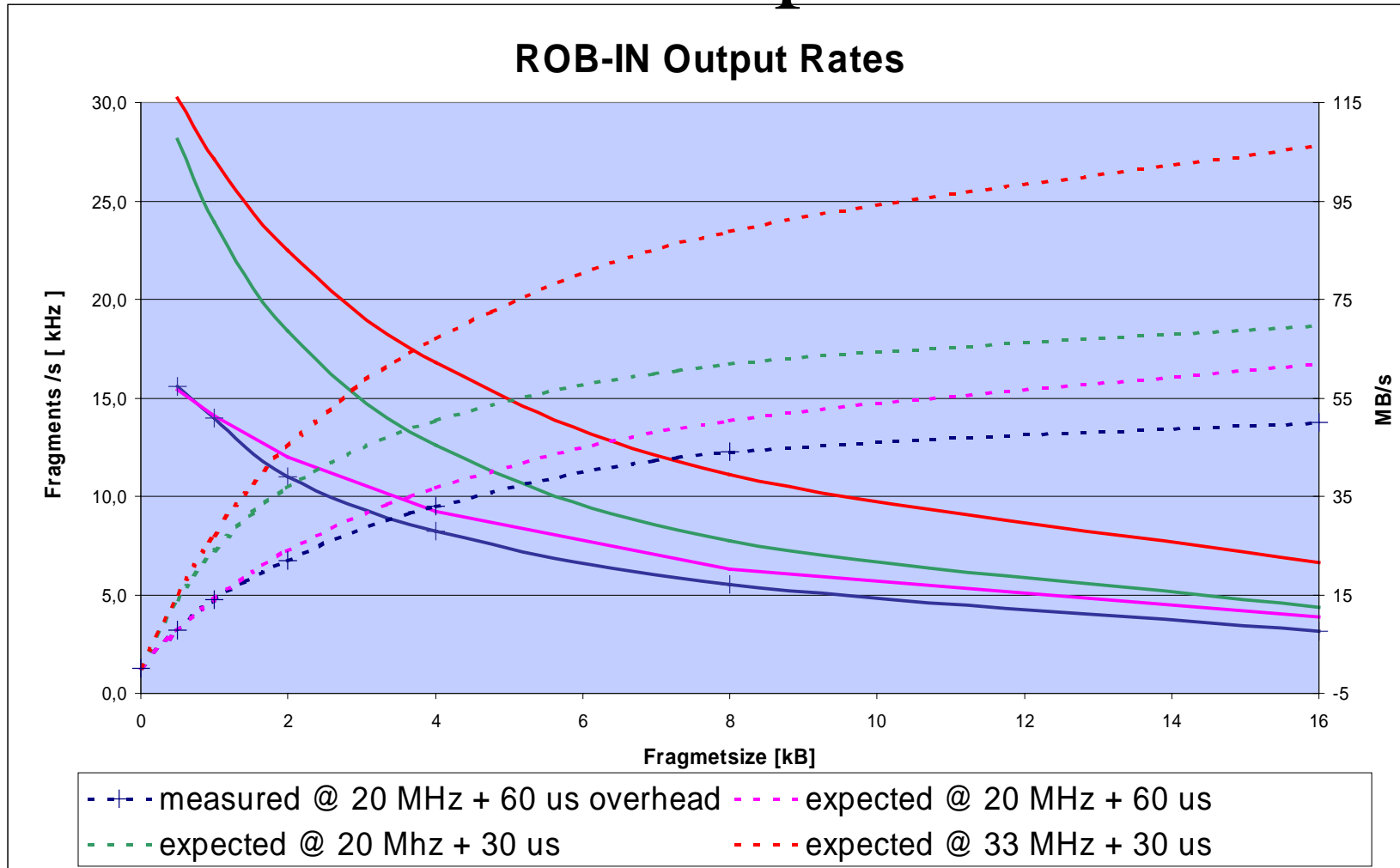
Inbound process



ROB-IN Output



ROB-IN Output Rates



Preprocessing

- Implementet for TRT Barrel (old Data format)
- 1642 Straws with ca. 30 % occupancy
average of 2 hits per Straw
- average Proccessing Time:
 $2600 \text{ CLK @ } 20 \text{ MHz} = 130 \mu\text{s}$

Preprocessing measurements

- Outputrate with preprocessing and $140\mu\text{s}$ Softwareoverhead:
 $9 \text{ MB/s} = 4 \text{ kHz Eventrate}$
- New Driver with ca. $30\mu\text{s}$ overhead
 $13 \text{ MB/s} = 6 \text{ kHz Eventrate}$??????
- Processing of 2 unhit Straws in one CLK
 will give a factor of 1.3
 (without Softwareoverhead) ????????



Preprocessing Implementation

- Old dataformat
- unhit straws need 1 CLK
- Hit straws need 1 CLK + 1 CLK per BC
- New dataformat will give similar results
- processing of 2 unhit straws in one
CLK possible

Current implementation

- 512 kB RAM, Xilinx 4028 @ 20 MHz
- 127 Pages a 4kB =>
- 1,2 ms fragment-lifetime @ 100kHz
- max. fragmentsize 4kB
- Output Rate 33MB/s = 8,3 kHz with old devicedriver
- Slink-Interface @ 20 MHz = 80 MB/s