

FLES Input Interface

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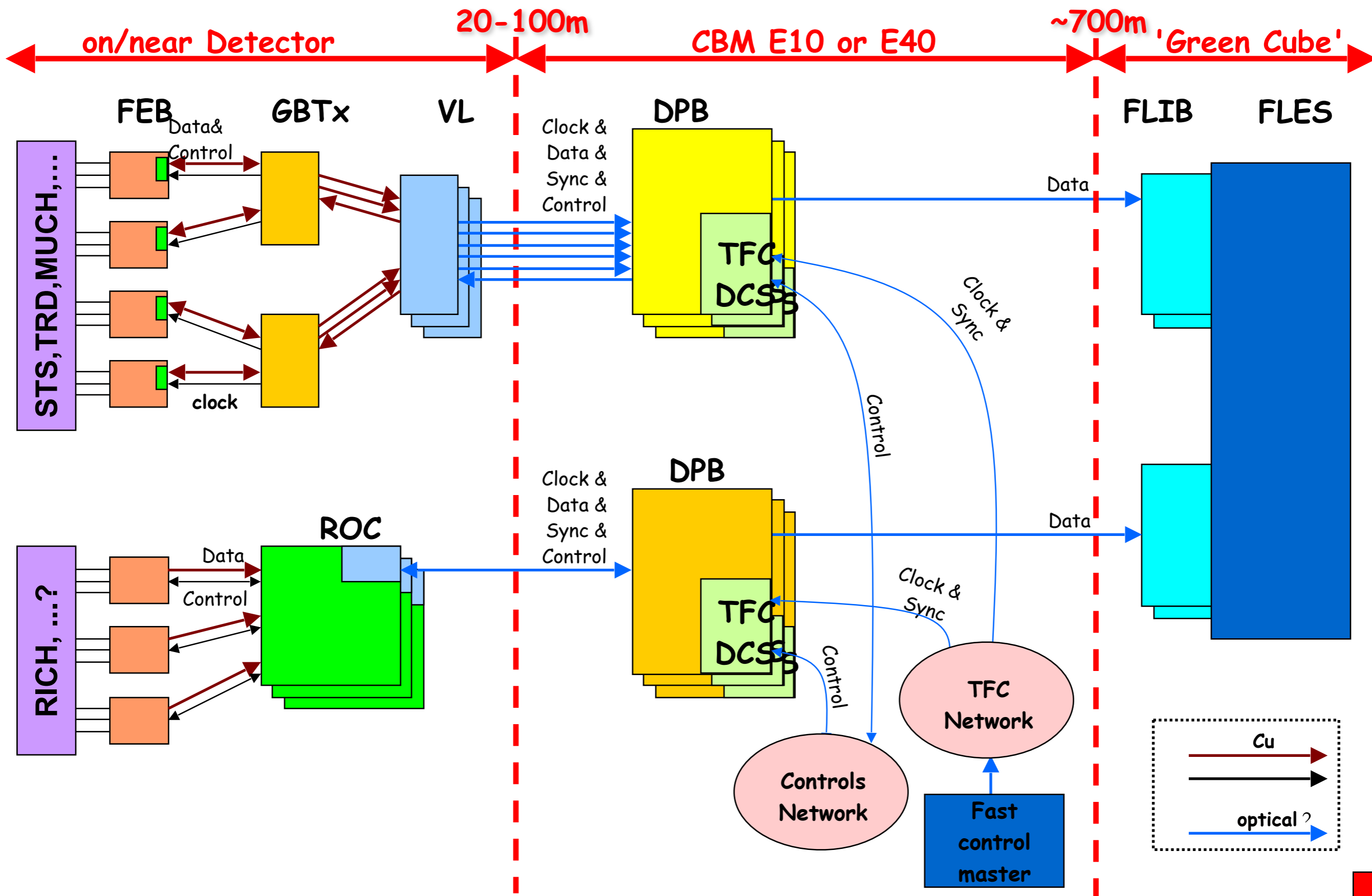
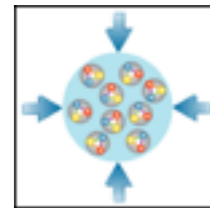
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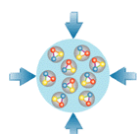
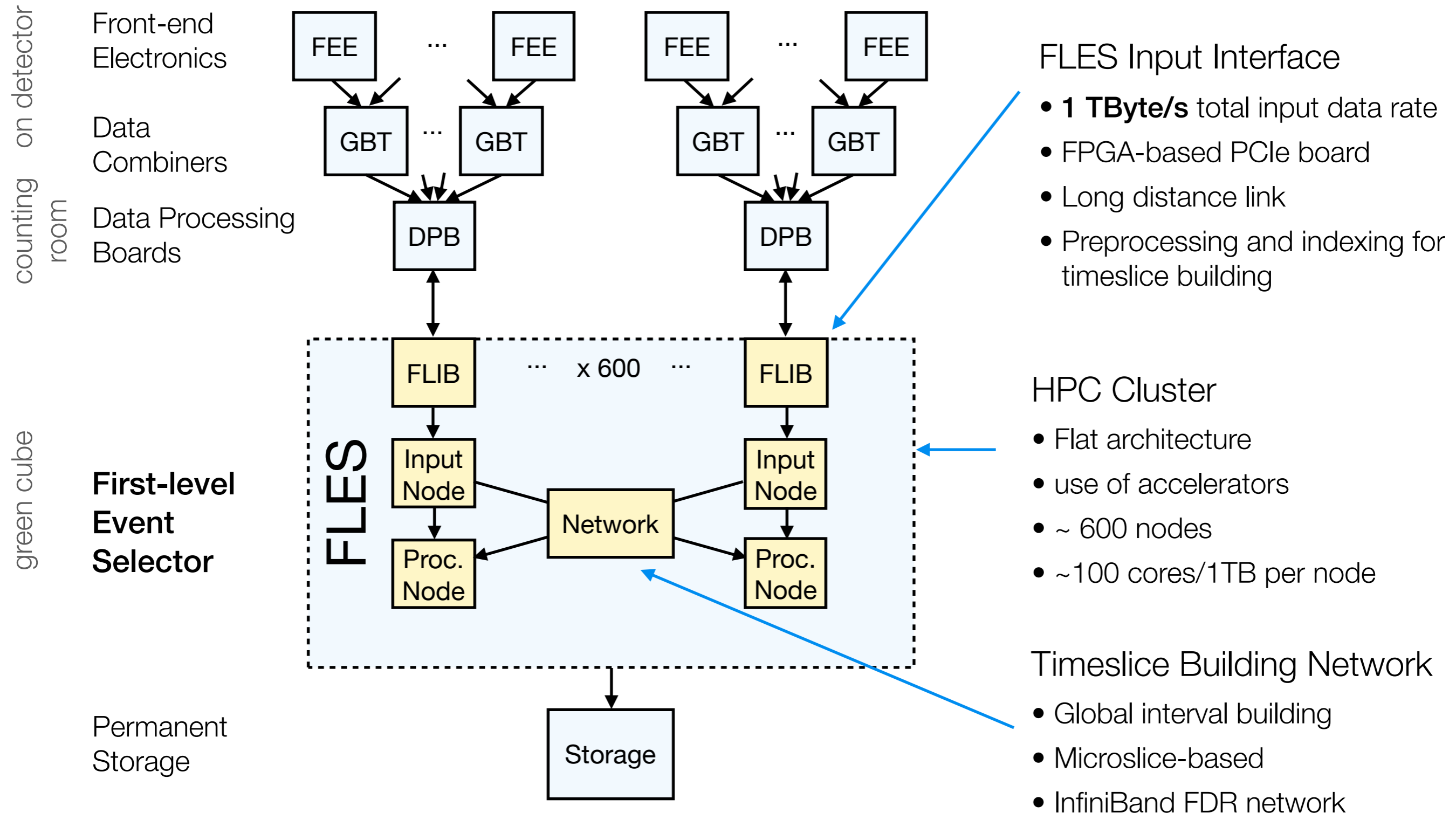
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CBM Data Flow – Full Picture

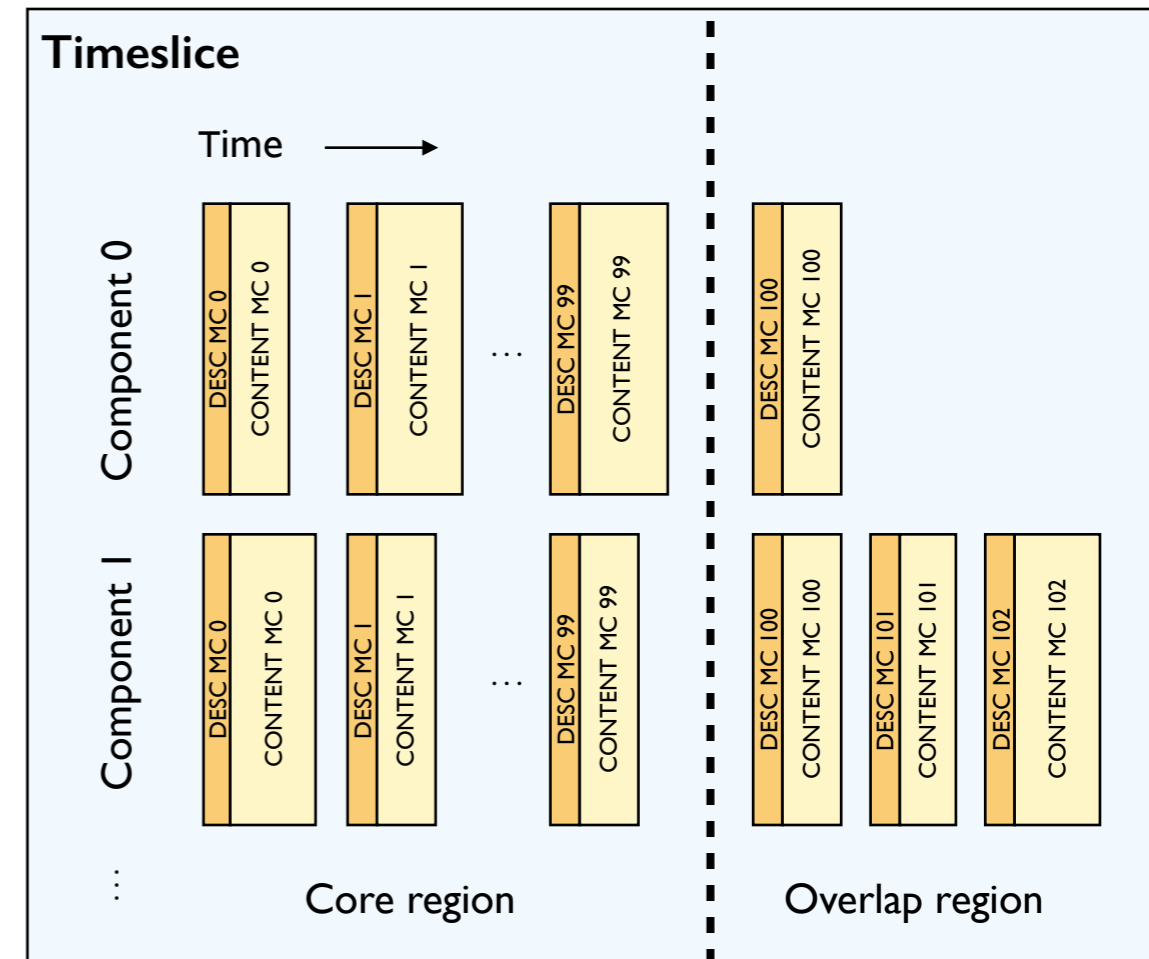


FLES Architecture

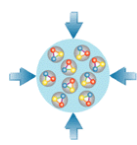
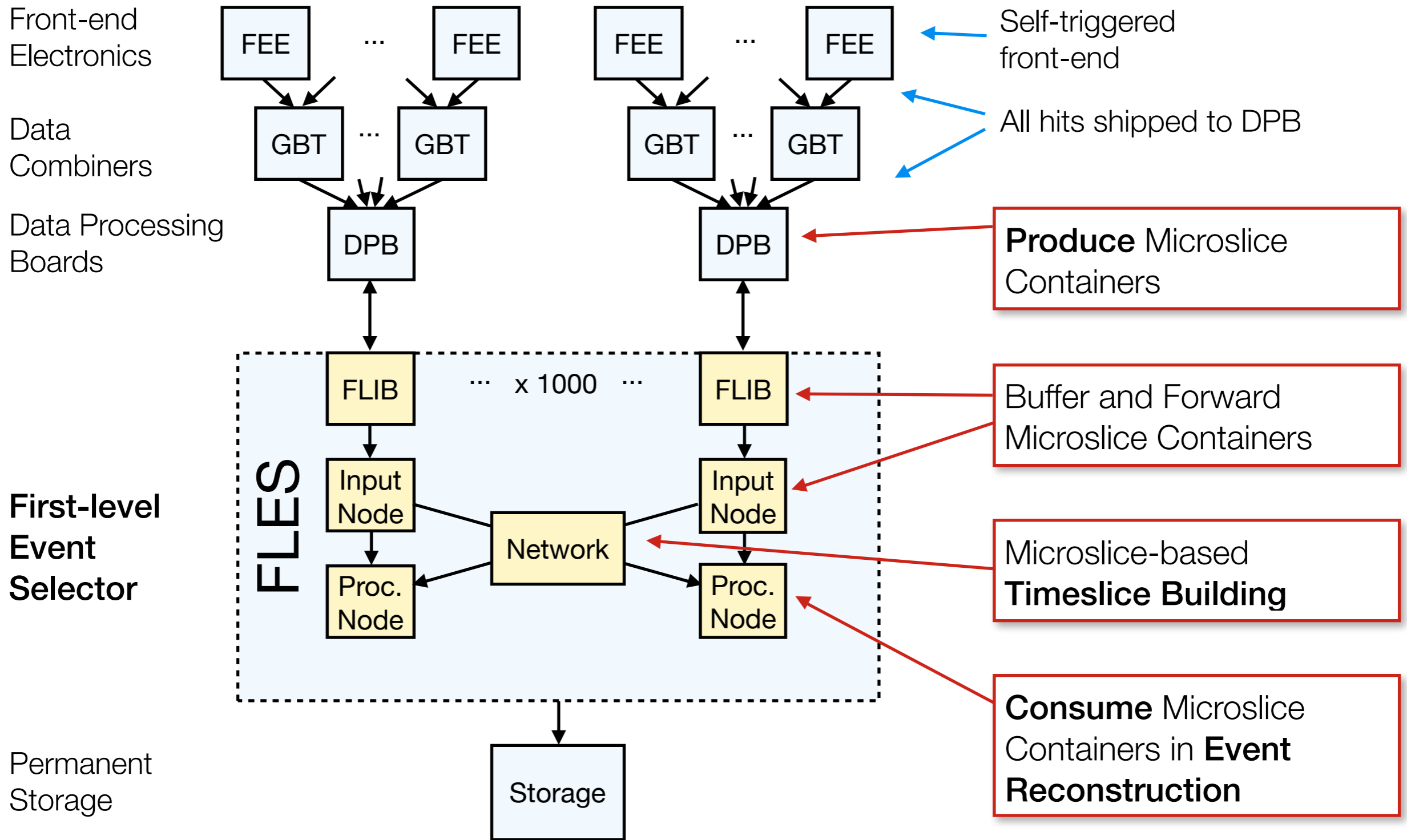


Timeslices

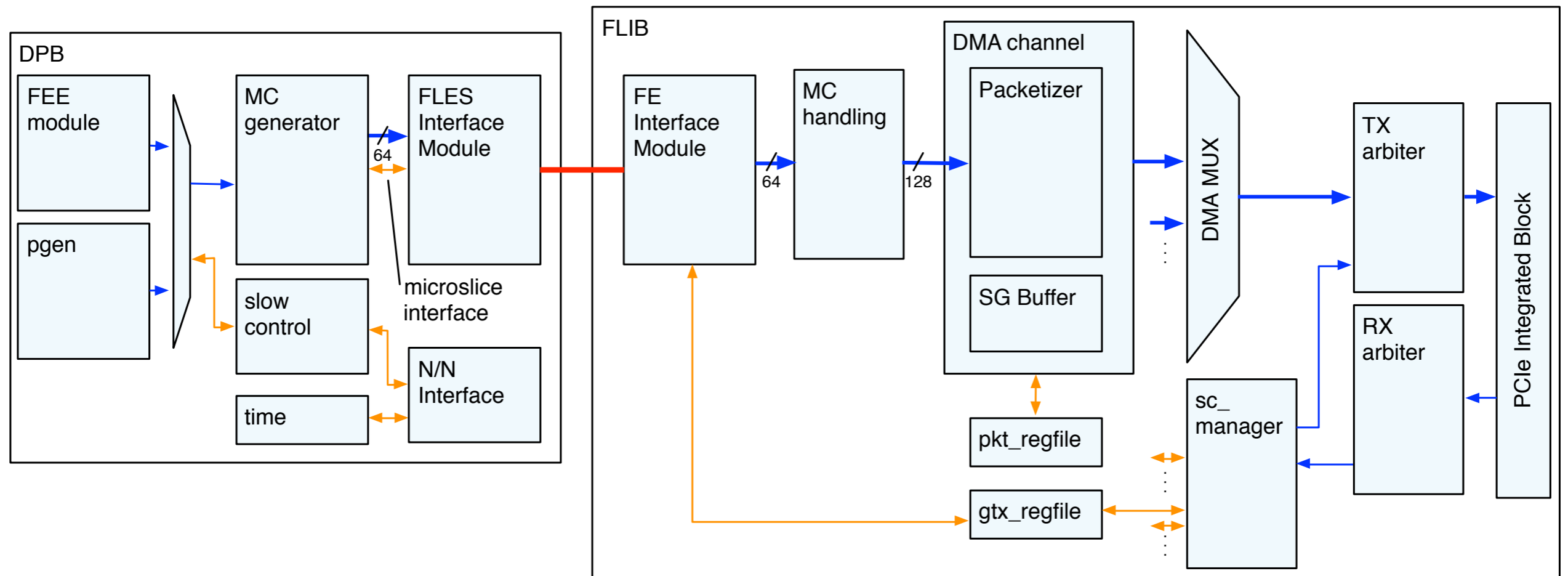
- Prior to processing all data is combined to global processing intervals aka Timeslice
- Different Timeslices are distributed to different compute nodes
- Timeslices are a two-dimensional collections of Microslices
 - Component equals input link
 - Fully indexed access to all Microslices within a Timeslice
 - Overlap region allows independent processing
- Microslice
 - Constant in experiment time, variable in data size
 - Timeframe covered by one MC is the identical for all subsystems
 - Descriptor: start time and metadata for FLES timeslice building
 - Data content: self-contained subsystem data, detector-specific, unknown to data management



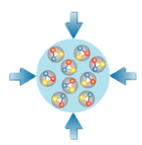
Microslices in CBM Online Computing



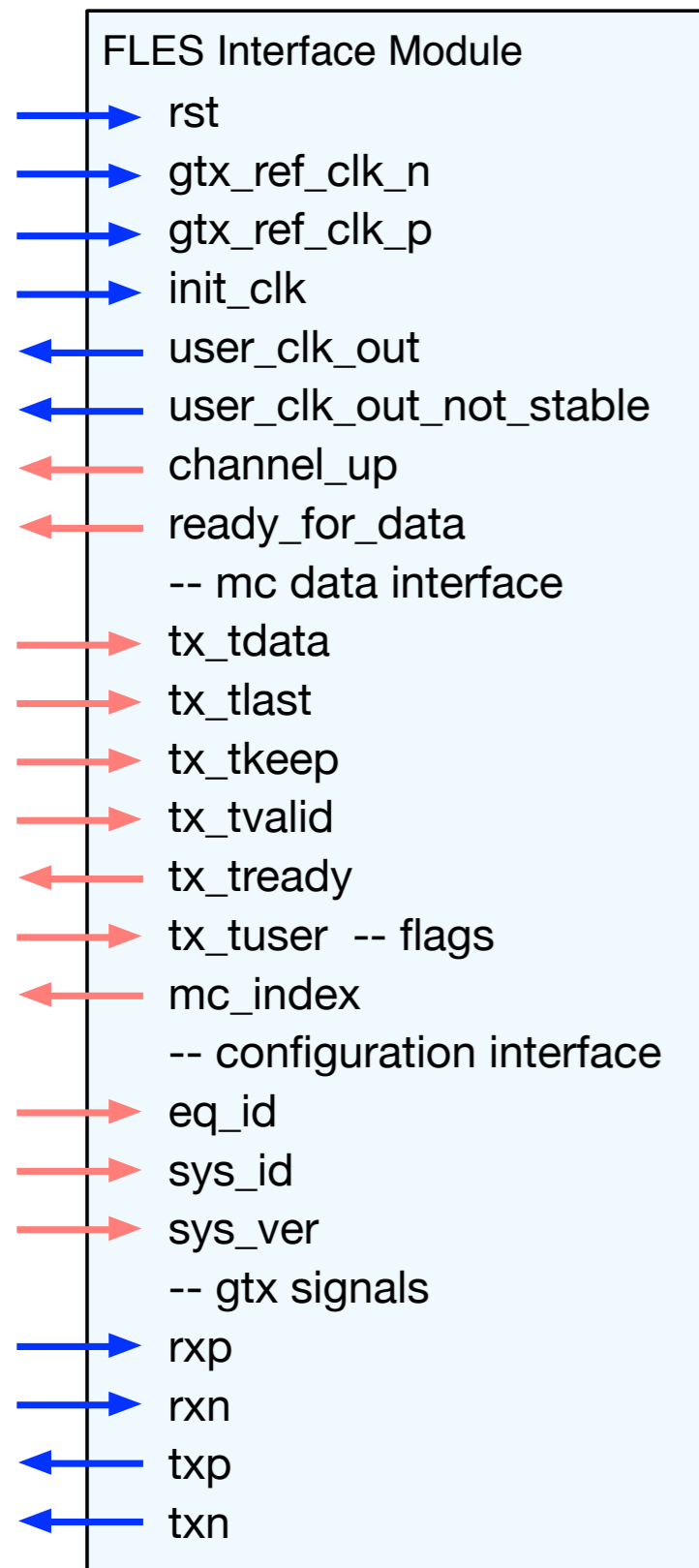
Data-flow Sketch



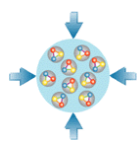
- DPB design partitions data streams into microslices
- Microslices are transmitted to the FLIB via the FLES interface module
- Data is written via DMA to the PC memory



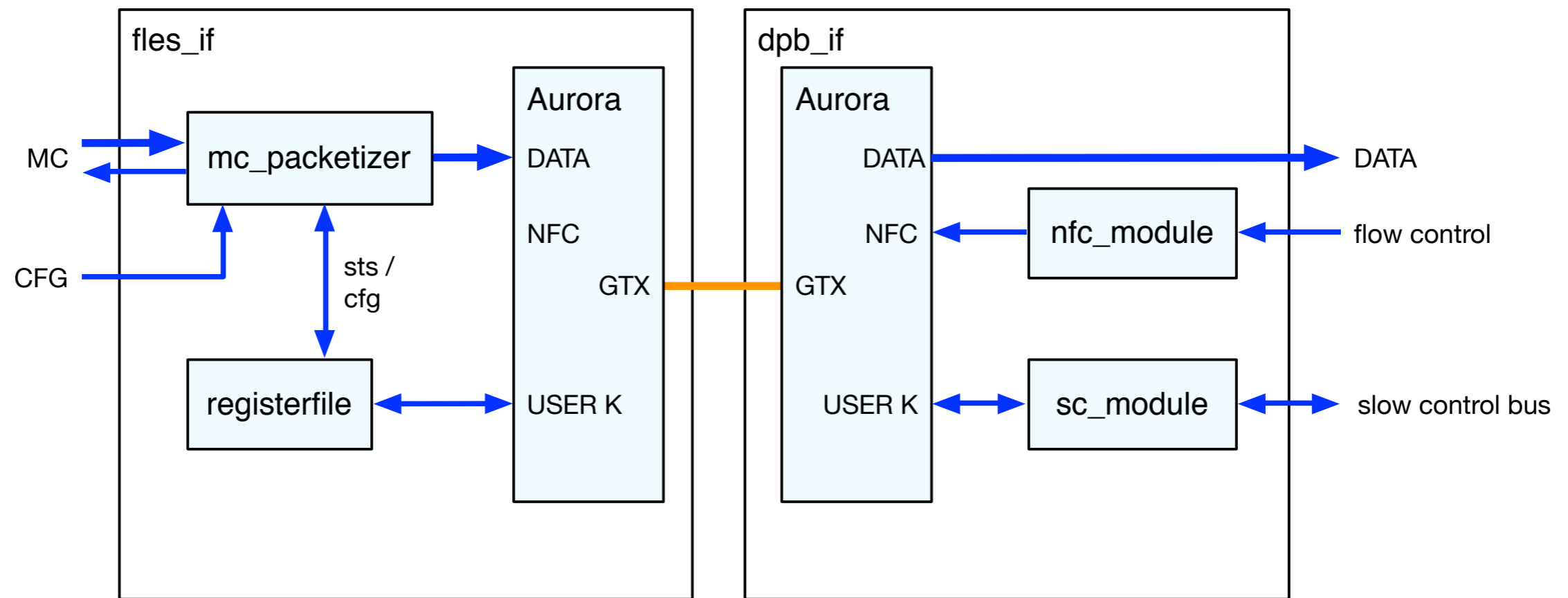
FLES Interface Module - User Interface



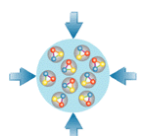
- Configuration interface
 - Inputs for static configuration
 - Fixed at join of data taking
- Microslice data interface
 - AXI stream like packet interface
 - 1 packet = 1 microslice content
 - Flags for runtime signaling
- User streams data into the interface
- Descriptors are created internally by the interface module



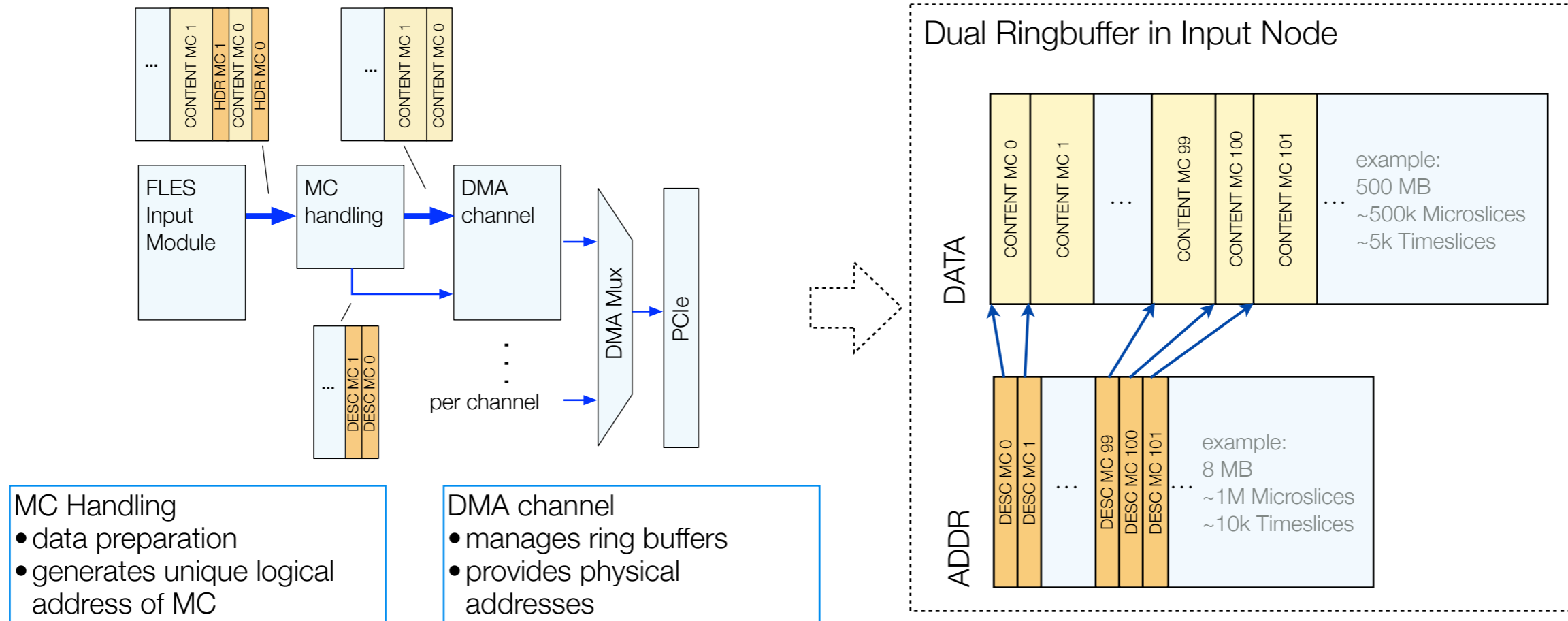
FLES Interface Development



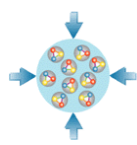
- Transport layer based on 10Gbit/s 64B/66B Aurora protocol
- The interface module itself can be configured via the FLES link
- Links should be allowed to re-join data taking



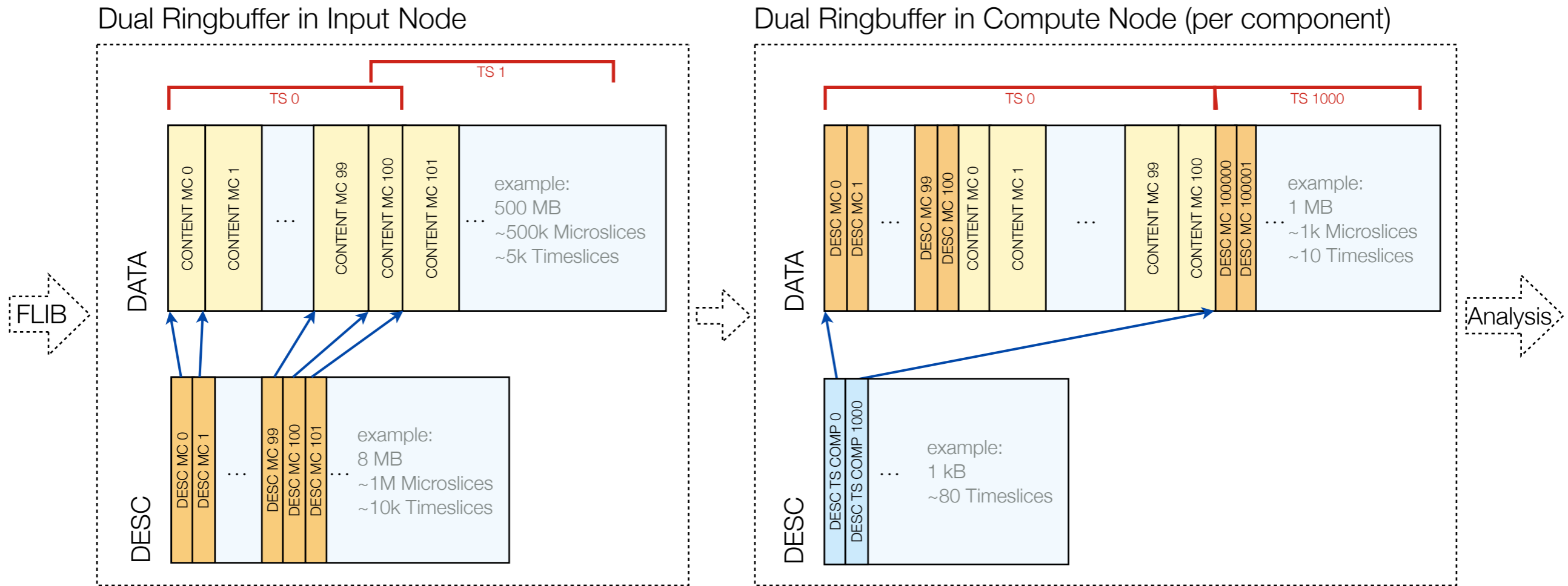
FLIB Data Handling



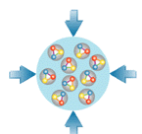
- For each link one pair of ringbuffers is managed
- Microslice data content (if not empty) is written to data buffer
- One descriptor is created for every Microslice and written to descriptor buffer
 - Contains: continuous running data address in buffer
- Descriptor buffer hold only fixed size elements and can therefore serve as index table to MC data



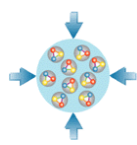
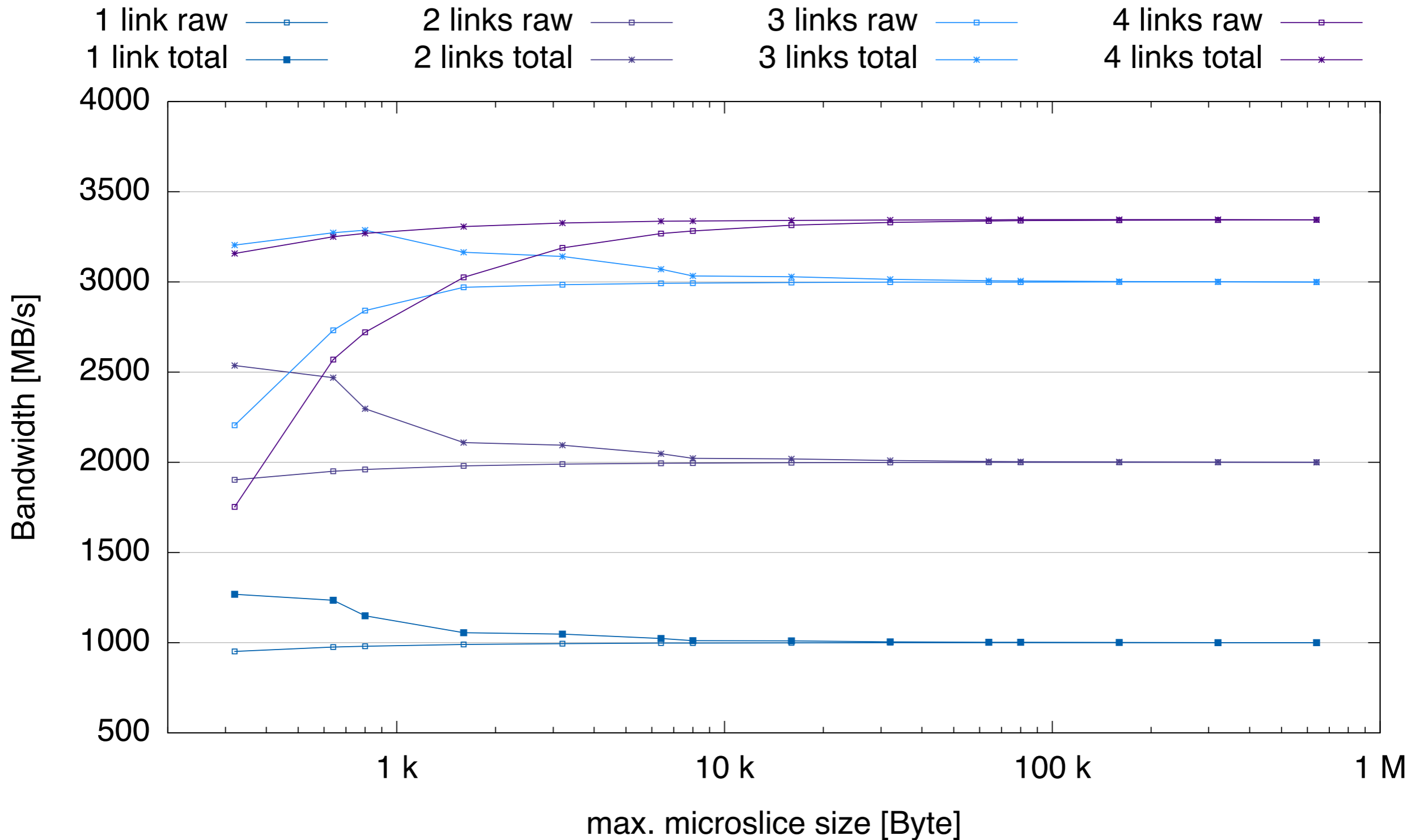
Timeslice Building Data Handling



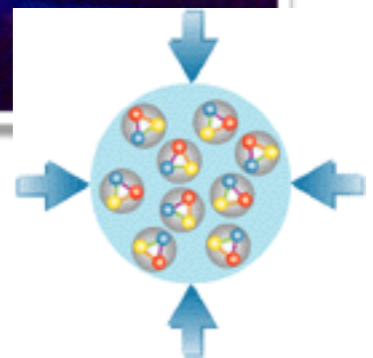
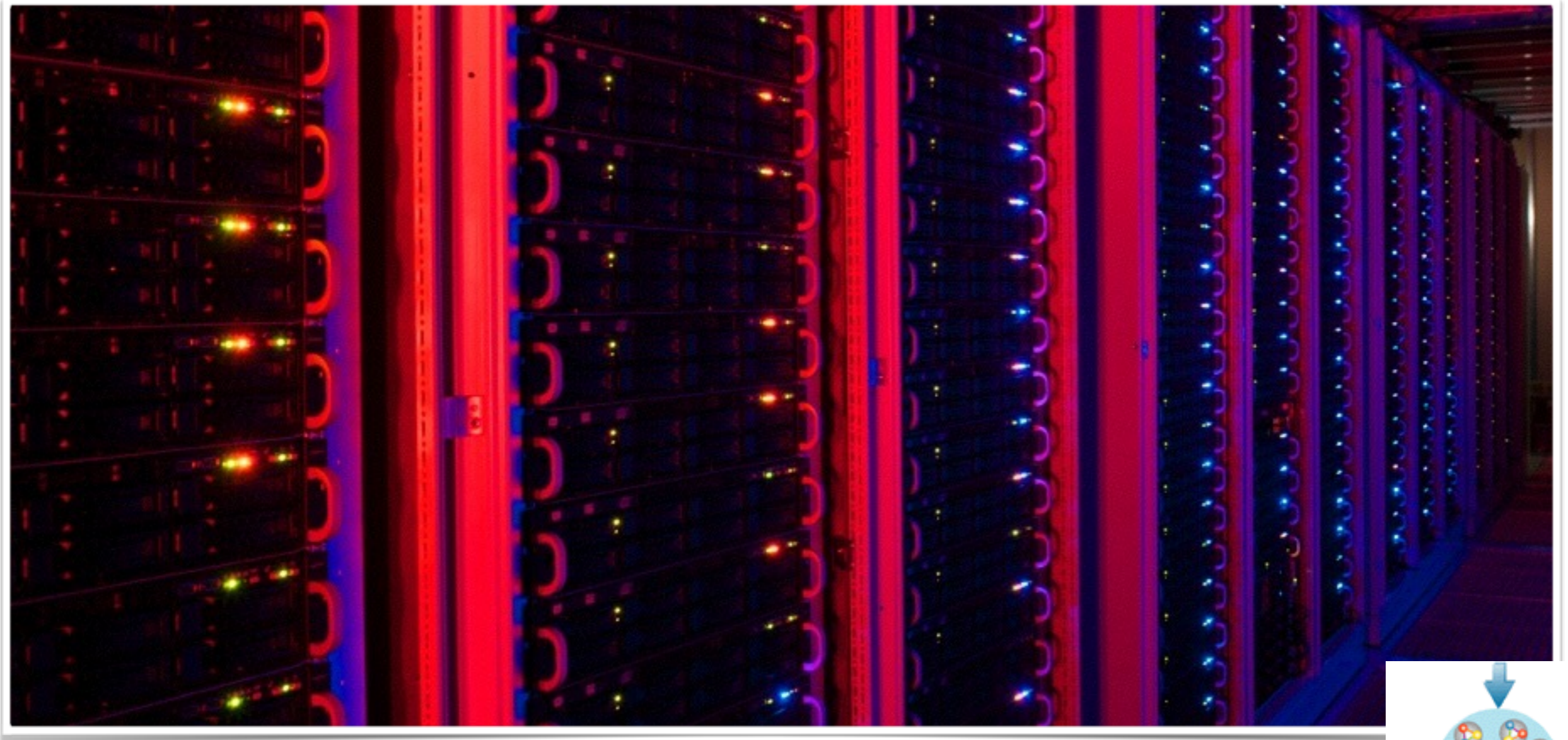
- For each component (= link) two pairs of ringbuffers exist
- For on Timeslice a continuous block of Microslices is copied (exception: borders)
- MC descriptors and MC data content is copied to data buffer
- Descriptor buffer holds TS component descriptors
- Additional TS descriptor holds addresses to TS descriptor buffer



PCIe DMA Performance



Thanks for your attention



CBM

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