Region of Interest Collector Demonstrator Review

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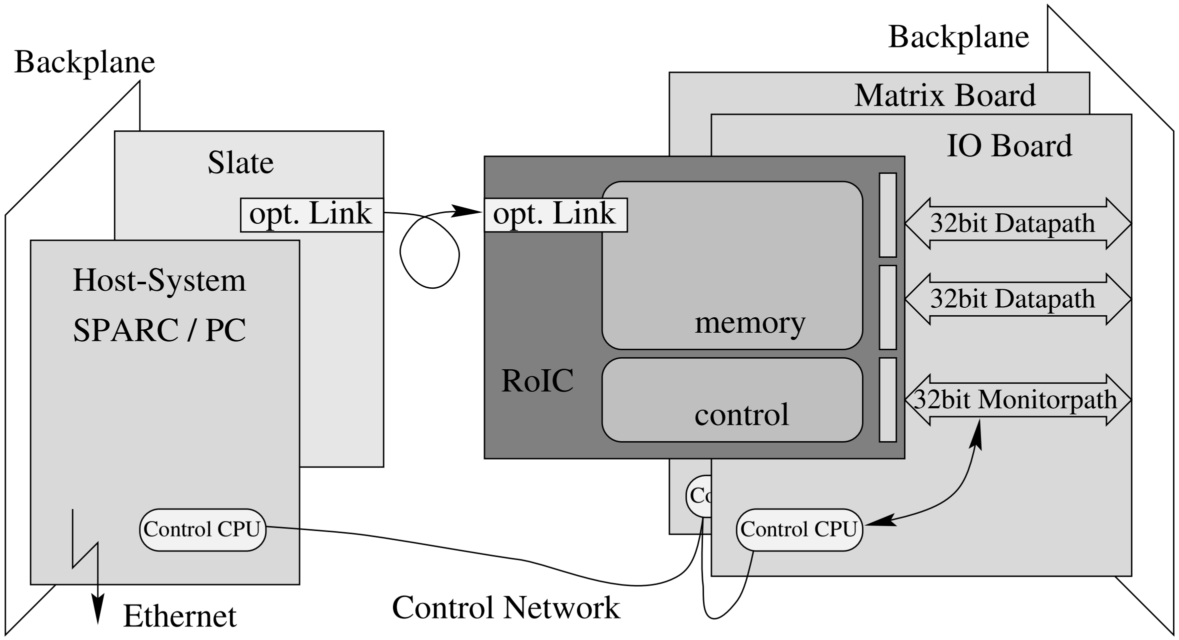
Demonstrator Region of Interest Collector

- RoIC Demonstrator Overview
- RoIC Demonstrator Hardware
- RoIC Demonstrator Components

RoIC Demonstrator Limits

- 24 ROBs per event
- 8 RoIs per event
- 64 concurent events, 1 kByte fragemet size
- 16 concurent events, 4 kByte fragemet size
- Input bandwidth 116 MB/s
- Suppression of fragments below 12 Byte

RoIC Demonstrator Setup



Measurments

- SLATE, 26 MHz Input, 30MHz RoIC and Output
- max SLATE bandwidth 83.6 MB/s for 1 kByte fragments
- continuous operation
- similar ”Pairs” communication
- 1 RoI
- 6 Fragments
- Fragments are sorted

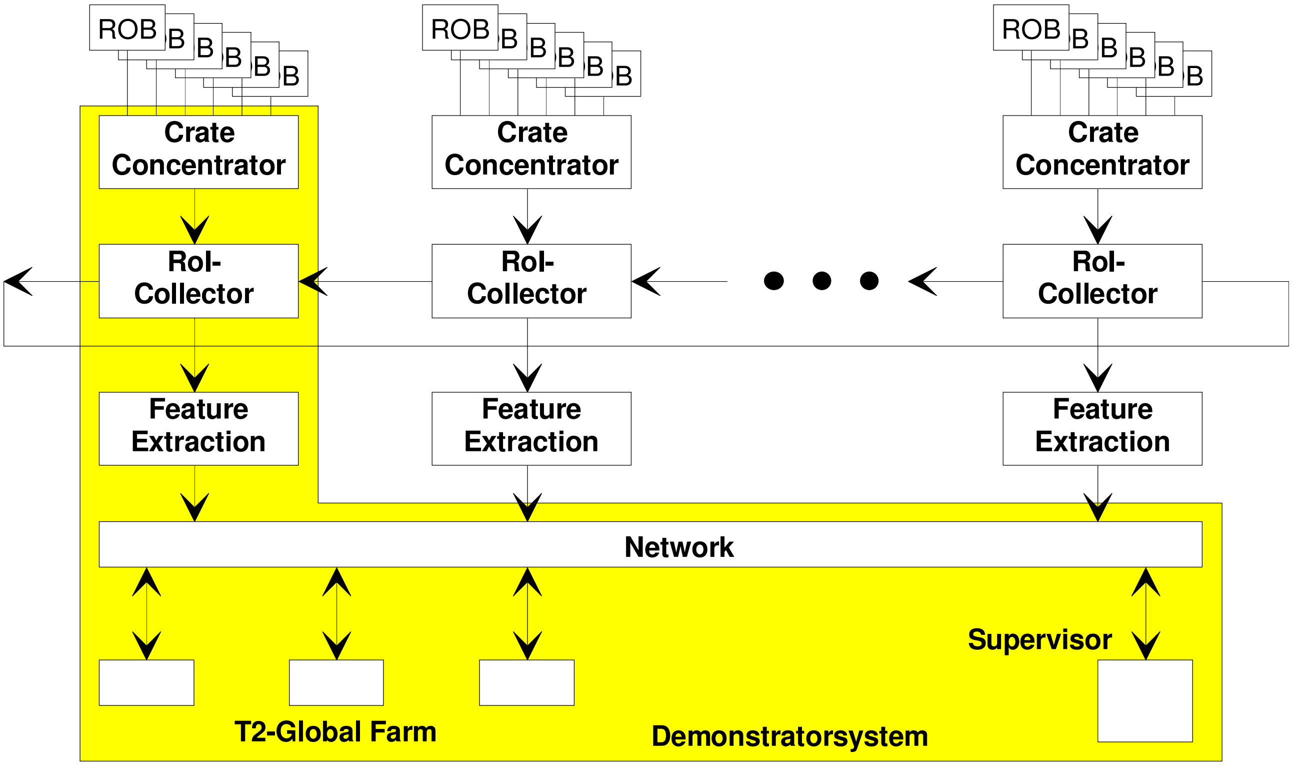
Results

- 740 kHz maximum fragment frequency
- 60 byte packet size at half the maximum throughput
- 2.3 μs RoIC reaction time
- 10 μs minimum delay
- Input time determine the delay
- order of arriving fragments and events determine the latency

Summary

- full functionality
- successful integration of RoIC and ENABLE++
- RoIC meets Requirements
- 1 kByte Fragment frequency above 200 kHz
- Input is bottleneck
- Proposal for a Compact ROB

Demonstrator System (Overview)



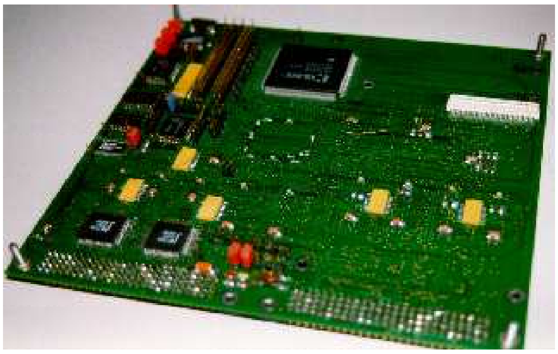
RoI-Collector:

Input:
* RoI fragments from local group of ROBs
* RoI fragments from neighbour RoIC (incomplete RoI)

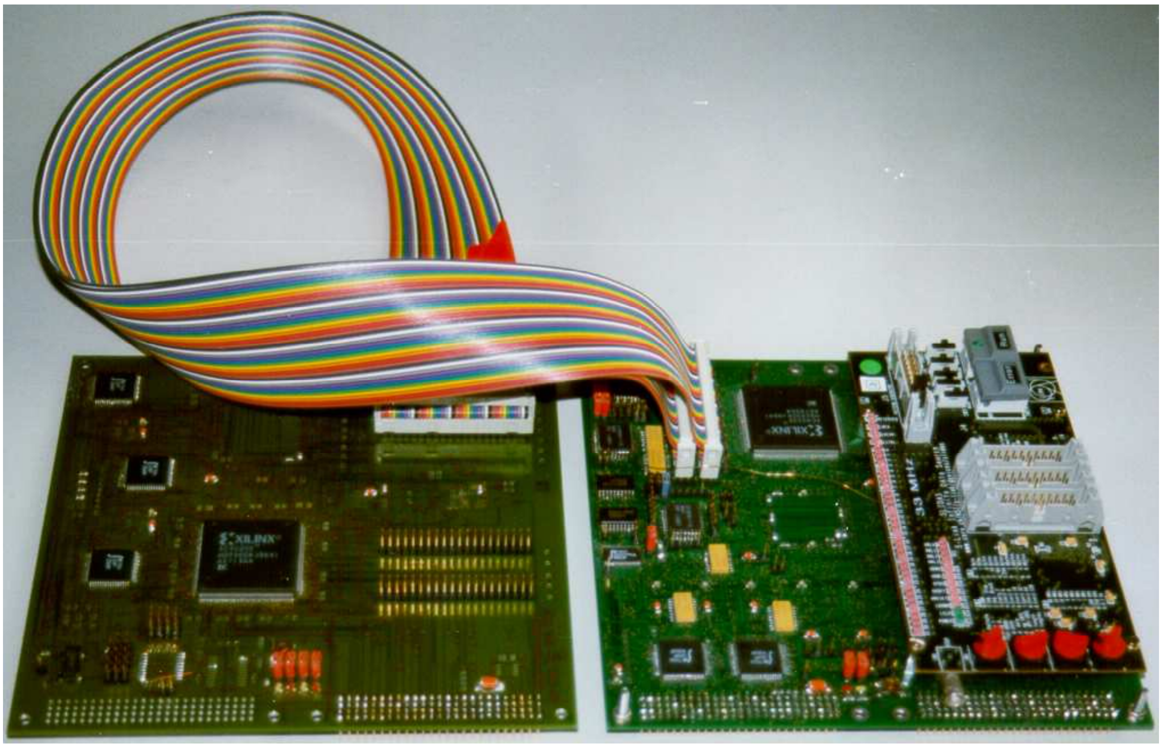
Output:
* complete RoI to FEX

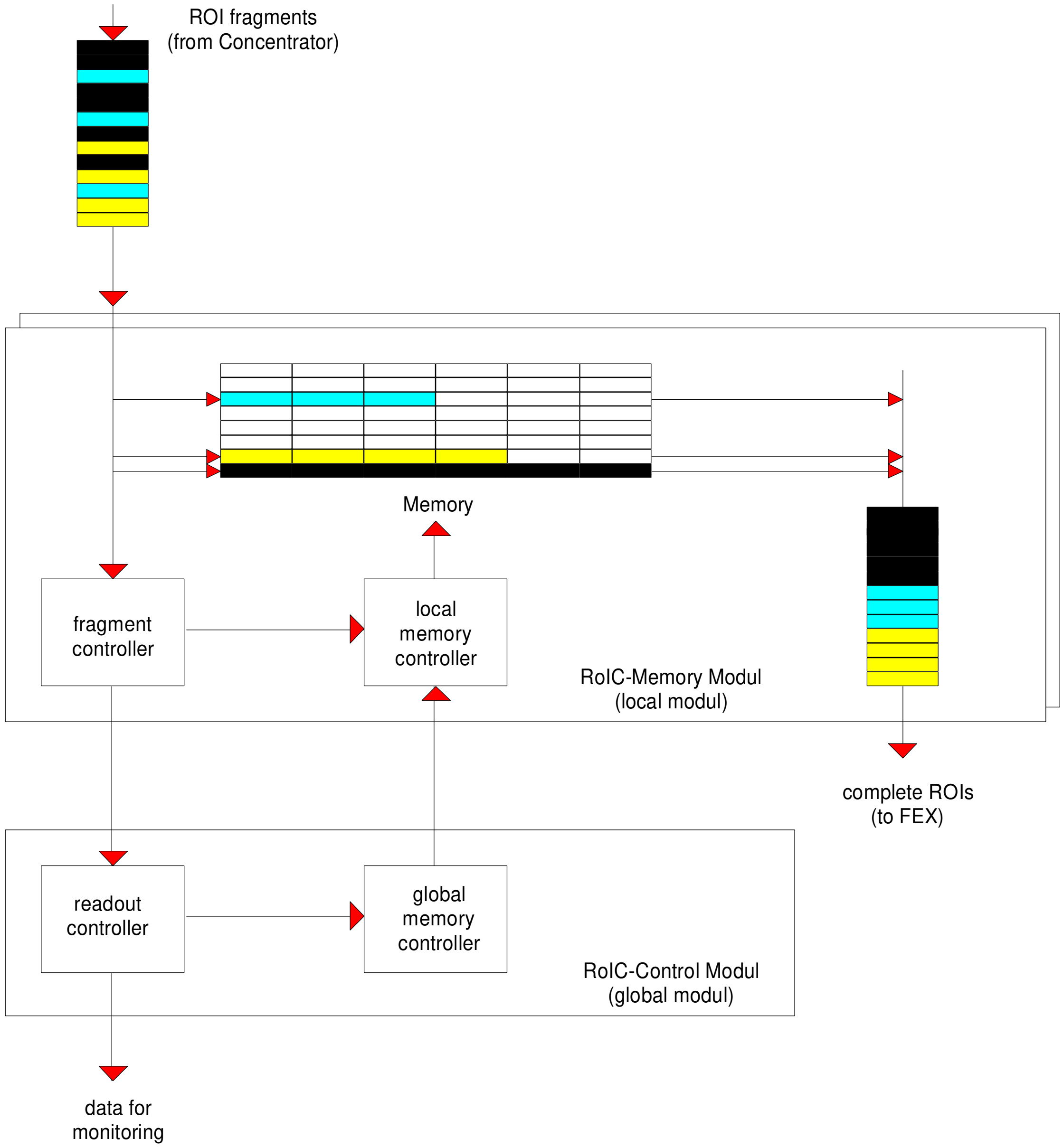
--> number of ROBs related to number of RoIC

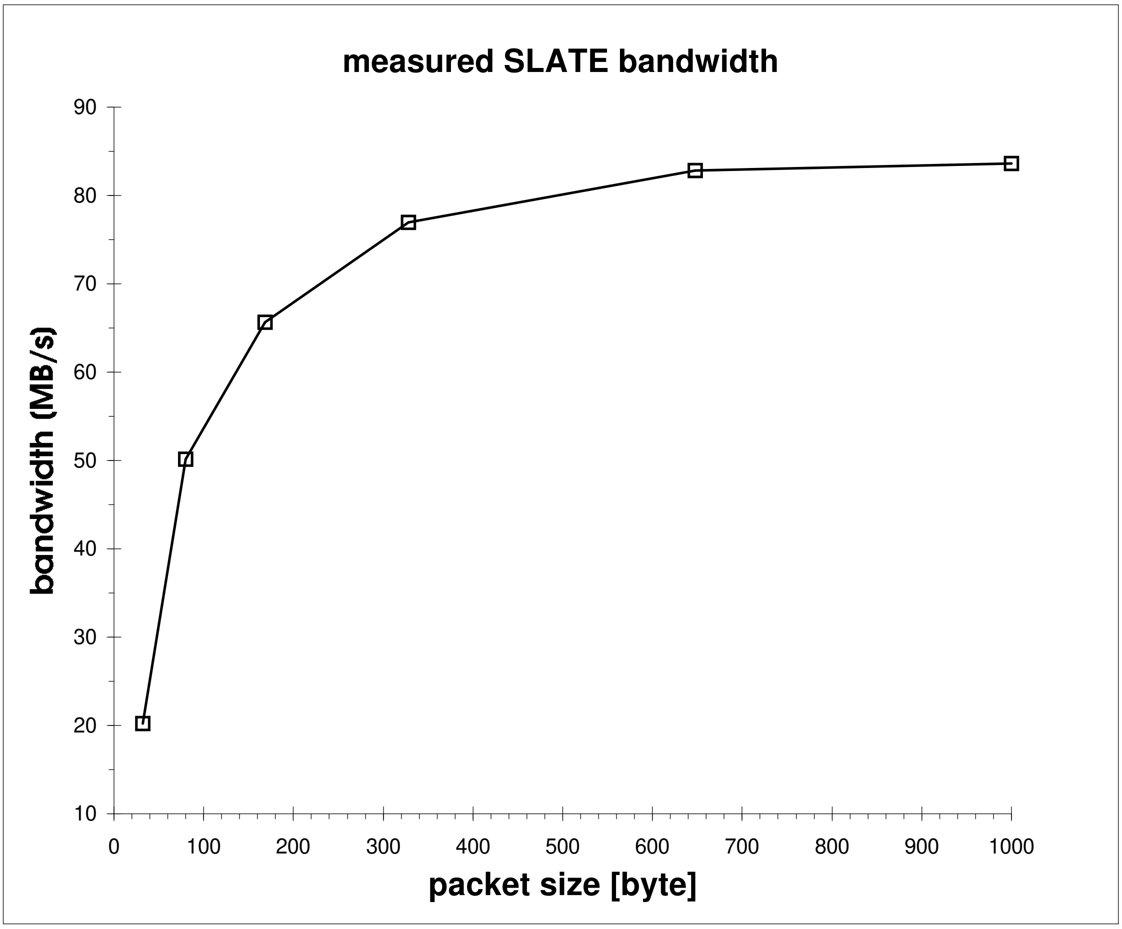
Memory Module

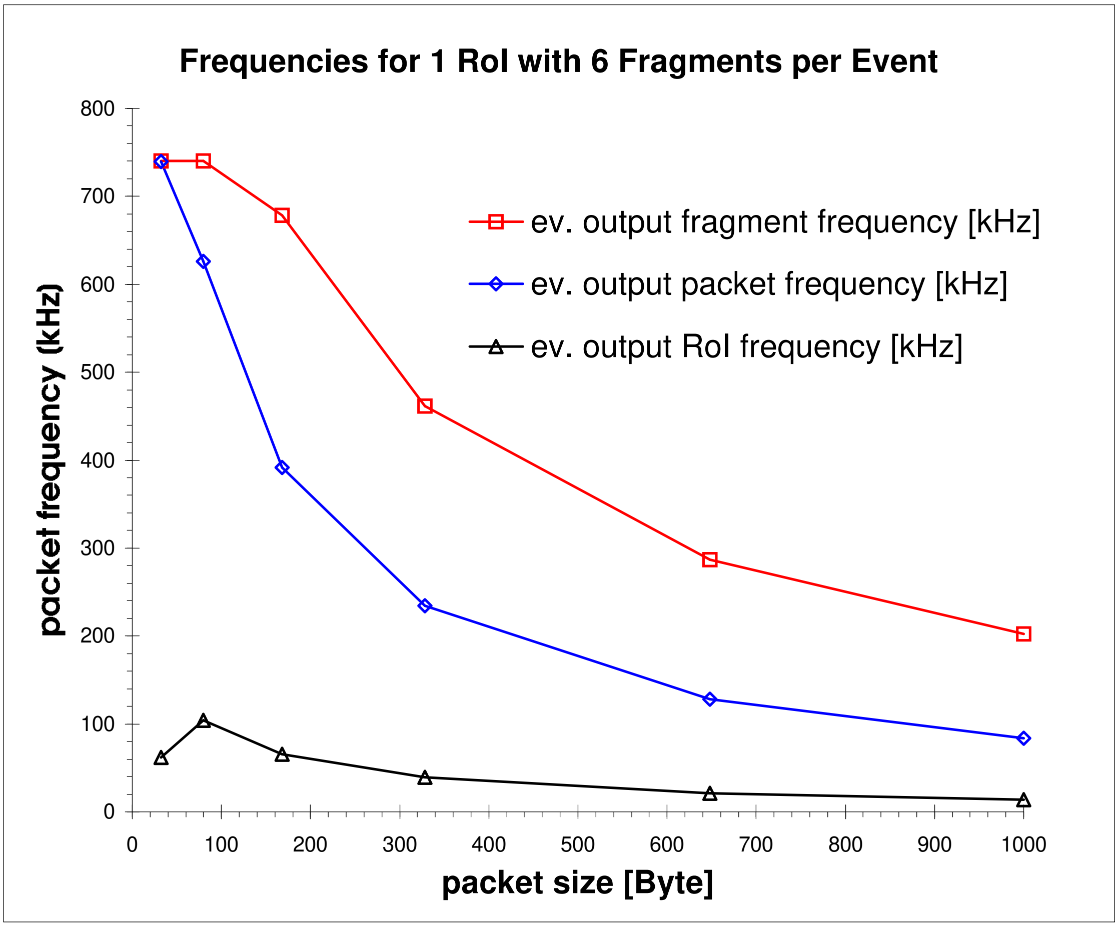


Region of Interest Collector (RoIC)




ROI fragments
(from Concentrator)
Memory
fragment
controller
local
memory
controller
RoIC-Memory Modul
(local modul)
complete ROIs
(to FEX)
readout
controller
global
memory
controller
RoIC-Control Modul
(global modul)
data for
monitoring


measured SLATE bandwidth
bandwidth (MB/s)
packet size [byte]
90
80
70
60
50
40
30
20
10
0
100
200
300
400
500
600
700
800
900
1000


Frequencies for 1 RoI with 6 Fragments per Event
packet frequency (kHz)
packet size [Byte]
ev. output fragment frequency [kHz]
ev. output packet frequency [kHz]
ev. output RoI frequency [kHz]
800
700
600
500
400
300
200
100
0
100
200
300
400
500
600
700
800
900
1000

V. Dörsing, 20.02.1998