

Upcoming Milestones for Readout

CBM-TRD Retreat, Schloß Waldthausen
27-29 March 2019

Philipp Kähler

Institut für Kernphysik, WWU Münster



SPADIC 2.2 Data Transport, Configuration, Unpacking

• New SPADIC words format

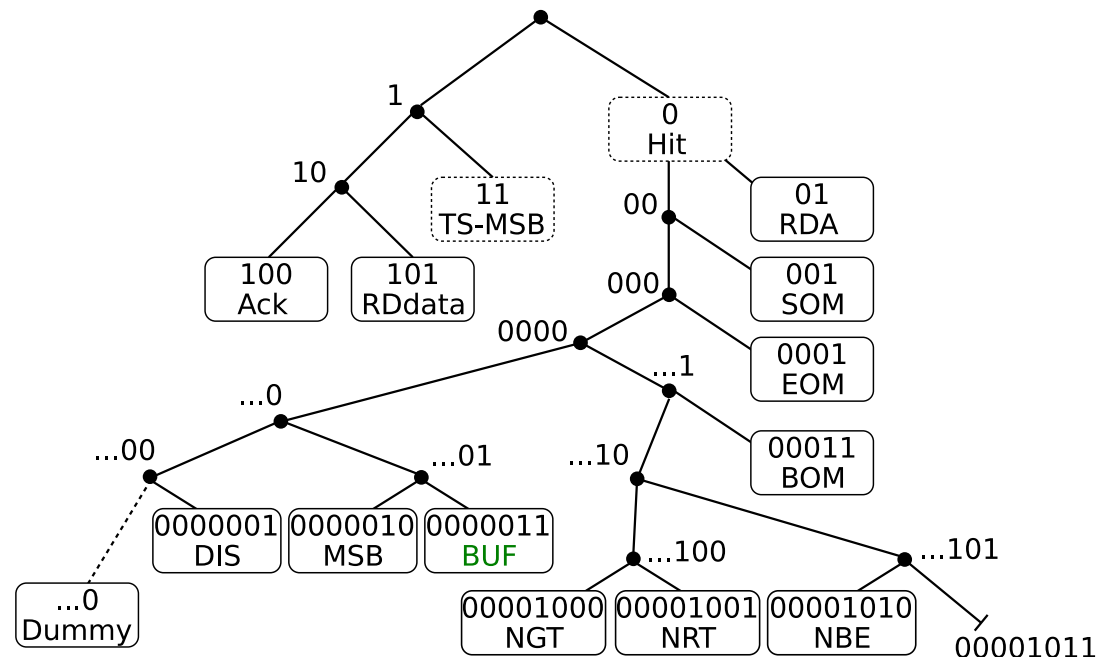
- Full usage of Xyter-Frames, 24 bit instead of 16 bit
- Transport layer in AFCK mostly unmodified
- Timestamp to 8 bit, new epoch frequency
- Baseline calibration to be adapted (Python), frequency

• Configuration, IPBus core

- New parameters: gain switch, shaping order, trending baseline
- Spadic_ui or equivalent

• Raw data unpacking

- Word and message classes to be updated





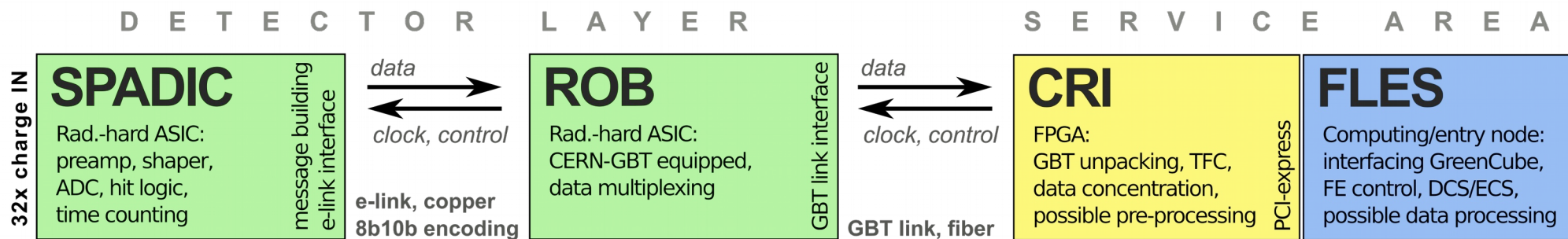
Multi-SPADIC Frontend Boards and GBTx Integration

• Multi-SPADIC boards

- Common links for control and clock, to be addressed
- FNR concept to be proven: inter-chip & inter-board

• GBTX integration

- Chip addressing through GBT layer
- GBTx core for unpacking
- Downlink: LVDS (SPADIC) ↔ SLVS (GBT) matching, currently in CROB-FMC





RealMicroslice Building

- **RealMicroslice building**

- Fixing of microslices in real time

- **Microslice format**

- Timing master, i.e. TOF-CLOSY handling
- Common readout: time-format in Microslice header, Microslice length
- Data efficiency: full usage of Microslice payload

System	Message	Bits format																																EM	EM = Event missed flag 7b free for extra flags																												
		63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32			31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
STS / MUCH	Hit	0																																																													
	TS MSB	1 0 0																																																													
	EPOCH	1 0 1																																																													
	to be defined	1 1 0																																																													
TOF	Empty	1 1 1																																																													
	GET4 Hit 32b	DPB ID (16b, MAC LSB)																Ch		Coarse time (12b)						Finetime (7b)				D	TOT (8b)				CRC (8b)				1	0	0	1	D = DLL Lock flag																				
	GET4 Hit 24b	DPB ID (16b, MAC LSB)																Ch		Coarse time (12b)						Finetime (7b)				E	CRC (8b)				0	1	1	0	E = edge																								
	GET4 Epoch	DPB ID (16b, MAC LSB)																L		Epoch (31b)						Stamp				S	DL	EL	MF	0	1	0	1	L = Link, S = Sync erro																									
	GET4 Slow Ctrl	DPB ID (16b, MAC LSB)																L		GET4 SLC message data (24b)						CRC (8b)				1	0	0	0	L = Link																													
	GET4 System	DPB ID (16b, MAC LSB)																L		Data (33b)						Data (7b)				1	0	1	0	L = Link																													
	GET4 Error	DPB ID (16b, MAC LSB)																L		Unknown GET4 message data (32b)						Data (7b)				1	0	1	0	L = Link, E = Edge																													
	GET4 Unknwn	DPB ID (16b, MAC LSB)																L		Unknown GET4 message data (32b)						Data (7b)				1	0	1	0	L = Link																													
	SYS SYNC err	DPB ID (16b, MAC LSB)																L		Unknown GET4 message data (32b)						Data (7b)				0	1	1	1																														
	STAR Trig. A	DPB ID (16b, MAC LSB)																gDPB Timestamp MSB (40b)																0	0	0	0	1	1	0	1																						
	STAR Trig. B	DPB ID (16b, MAC LSB)																gDPB Timestamp LSB (24b)																0	0	0	1	1	1	0	1																						
	STAR Trig. C	DPB ID (16b, MAC LSB)																Last STAR reset timestamp Mid bits (40b)																0	0	1	0	1	1	0	1																						
	STAR Trig. D	DPB ID (16b, MAC LSB)																Last STAR reset ts LSB (8b)				0 (12b Filler)				Trig cmd (4b)				DAQ cmd (4b)				Token (8b)				0	0	1	1	1	1	0	1																		

