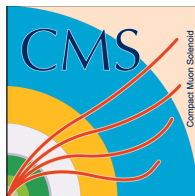


Status and Plans for ngFEC

Ulf Behrens, Kerstin Borrás, Alan Campbell,
Ingo Martens, Jannicke Pearkes,
Isabell Melzer-Pellmann, Pooja Saxena,
Özgür Şahin

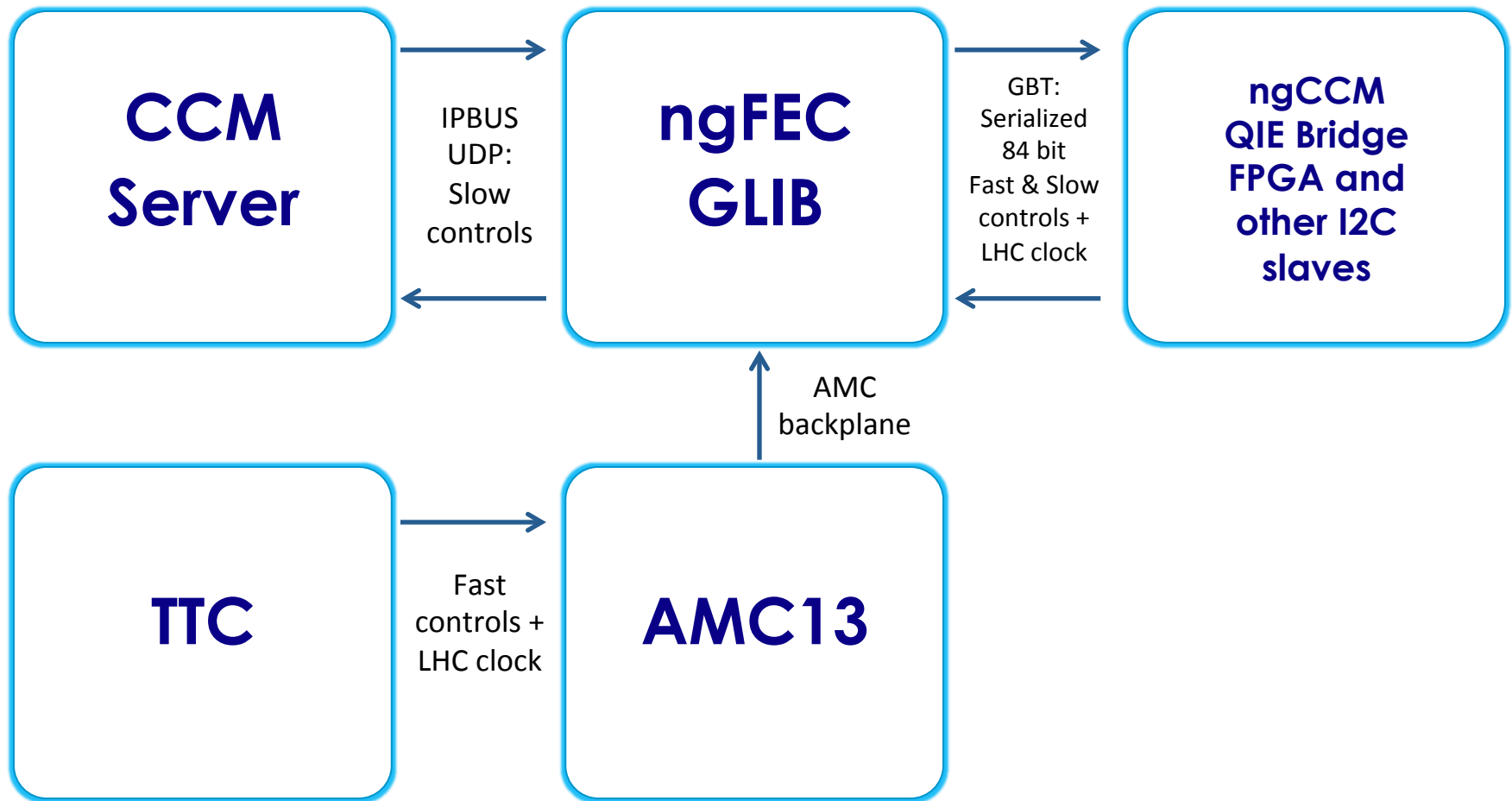


Inventory

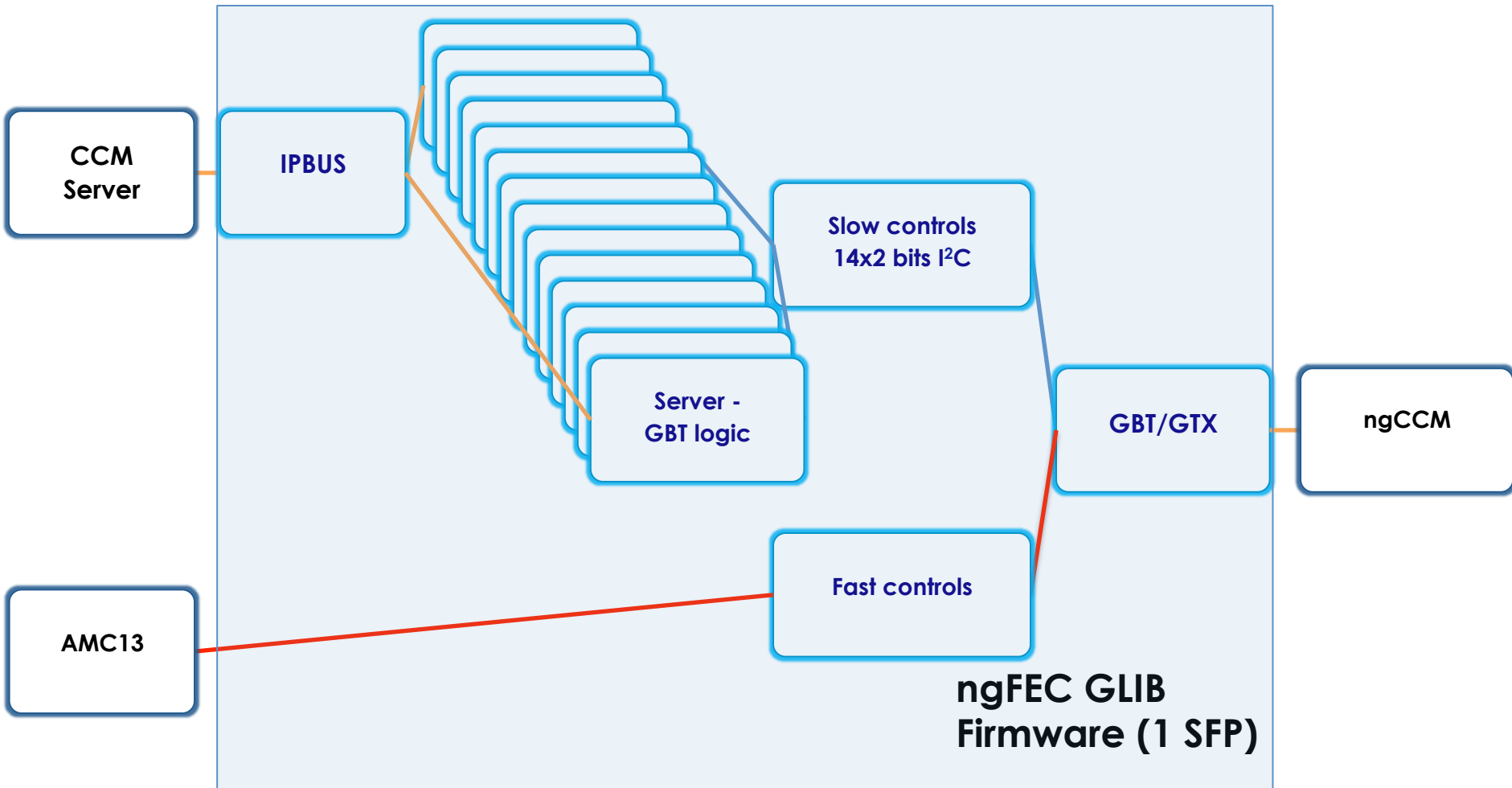
At DESY we have

- GLIB v3: **4**
- AMC13 v1: 1
- TTC test gadget: 1
- ngCCM prototype (2012)
- HF ngCCM (2013)
- **FC7: 1**
- ProAsic 3PL (QIE Bridge FPGA f/w loaded)

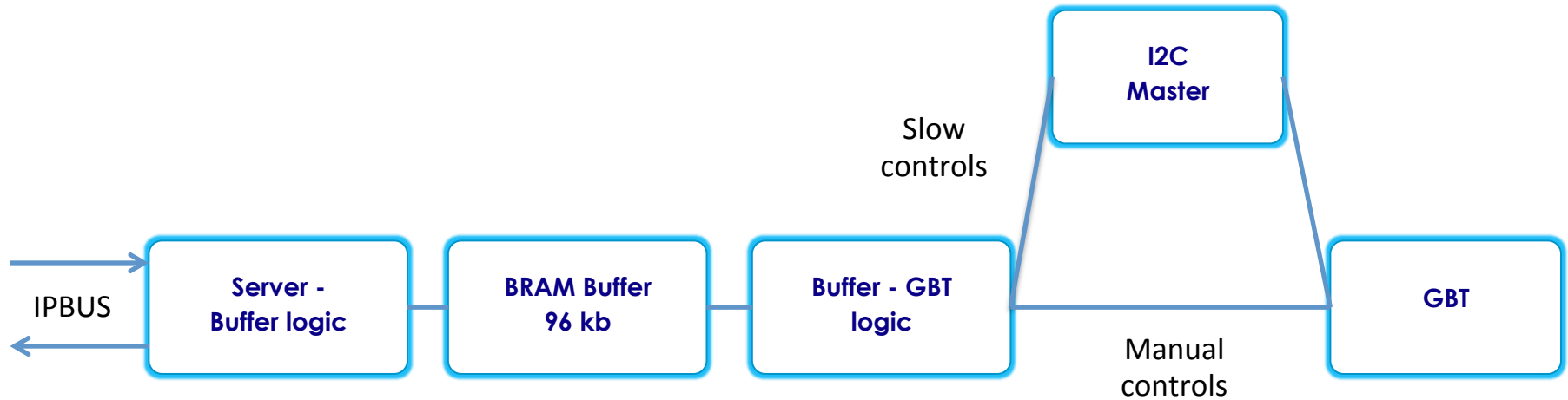
General Layout of the ngFEC



ngFEC GLIB Firmware

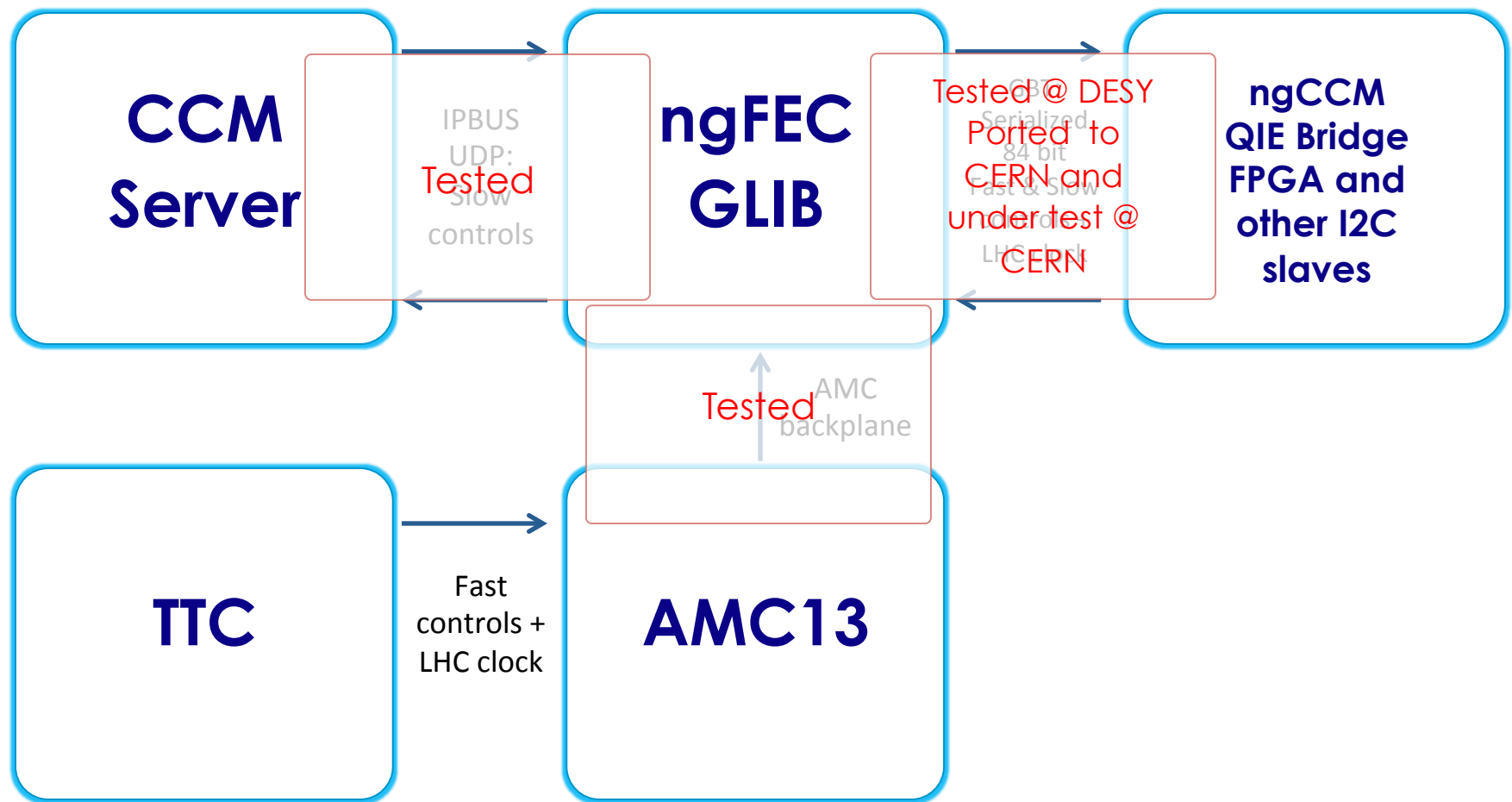


ngFEC GLIB Firmware



**Server GBT Logic
(1 channel)**

General Layout of the ngFEC



Status and Plans

- Right now the version (1.6.1) running at the CERN test stand can only drive 2 sfp connections.
 - We were using the custom GBT implementation from Stephen: Limited with number of MMCMs in Virtex 6.
 - With our summer student Jannicke, we are porting the recent GBT reference design to the ngFEC GLIB f/w.
 - We managed to drive 4 SFP connections; however, there is an instability problem.
- We just received a FC7 board.
- ngFEC Twiki: <https://twiki.cern.ch/twiki/bin/viewauth/CMS/HCALngFEC>
- ngFEC GLIB f/w SVN: https://svnweb.cern.ch/trac/cms-firmwsrc/browser/hcal/HCAL_GLIB_ngFEC

Backup

FPGA resource usage

ngFEC firmware with custom GBT implementation (2 SFPs)

	Used	Available
Slice registers	3268 (7%)	160000
BUFGs	26 (81%)	32
MMCM ADVS	7 (70%)	10
BRAM	108 (40%)	264

ngFEC firmware with reference GBT implementation (4 SFPs)

	Used	Available
Slice registers	44255 (27%)	160000
BUFGs	26 (81%)	32
MMCM ADVS	7 (70%)	10
BRAM	176 (66%)	264

FPGA resource usage

GLIB GBT reference design – Standard (1 SFP)

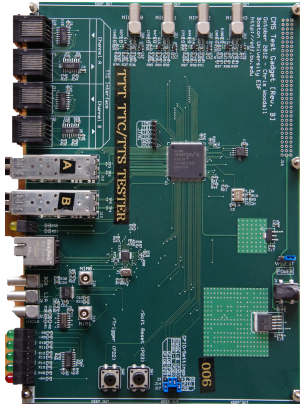
	Used	Available
MMCM ADVS	3 (30%)	10
BRAM	45(17%)	264
Slice registers	12492 (7%)	160000

ngFEC with reference GBT design – Latency optimized (1 SFP)

	Used	Available
MMCM ADVS	4 (40%)	10
BRAM	78 (29%)	264
Slice registers	16241 (10%)	160000

Current Setup

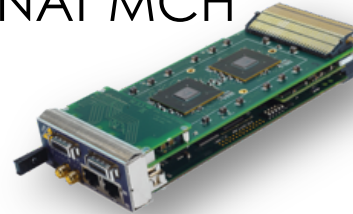
TTC Test Module



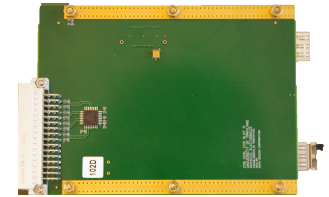
AMC13



NAT MCH

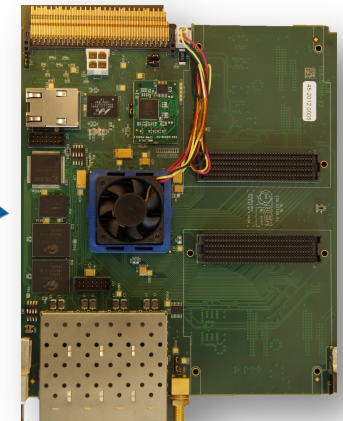


ngCCM Prototype



VADATECH PSU

VADATECH μ TCA
Crate



GLIB v3