A Wireshark based verification tool for the new LHCb common detector read-out board

Wireshark dissectors for dummies

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LHCb

Openlab Summer Student 2015

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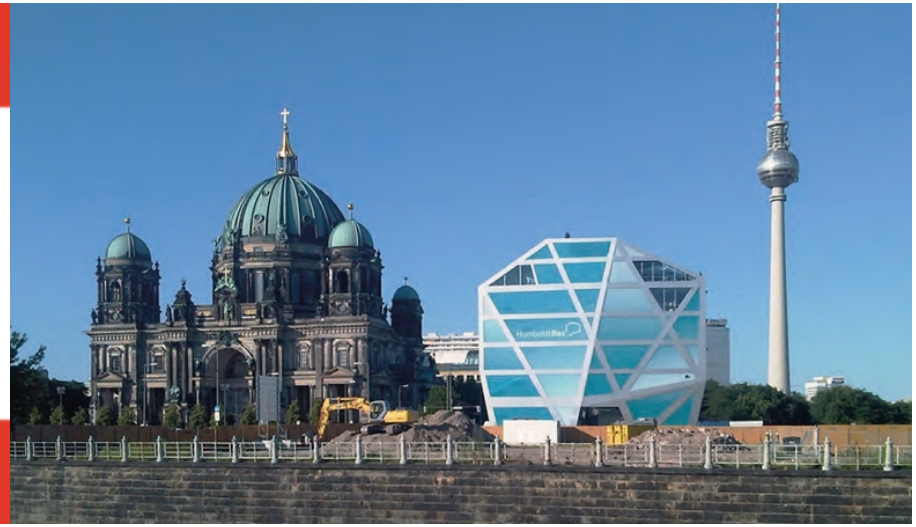

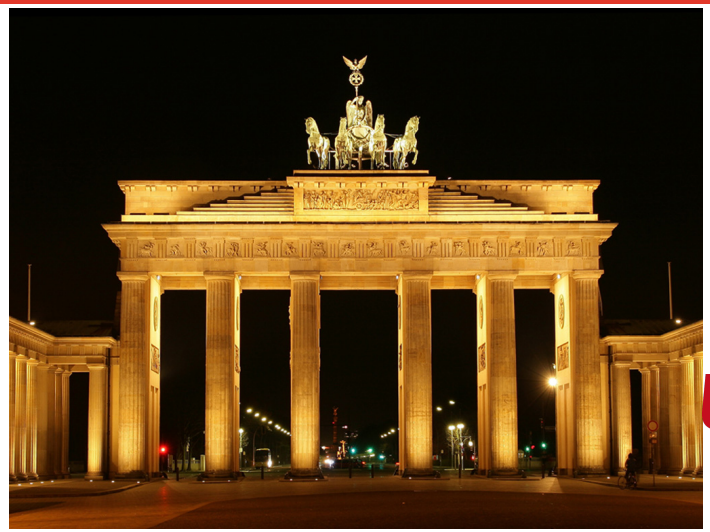

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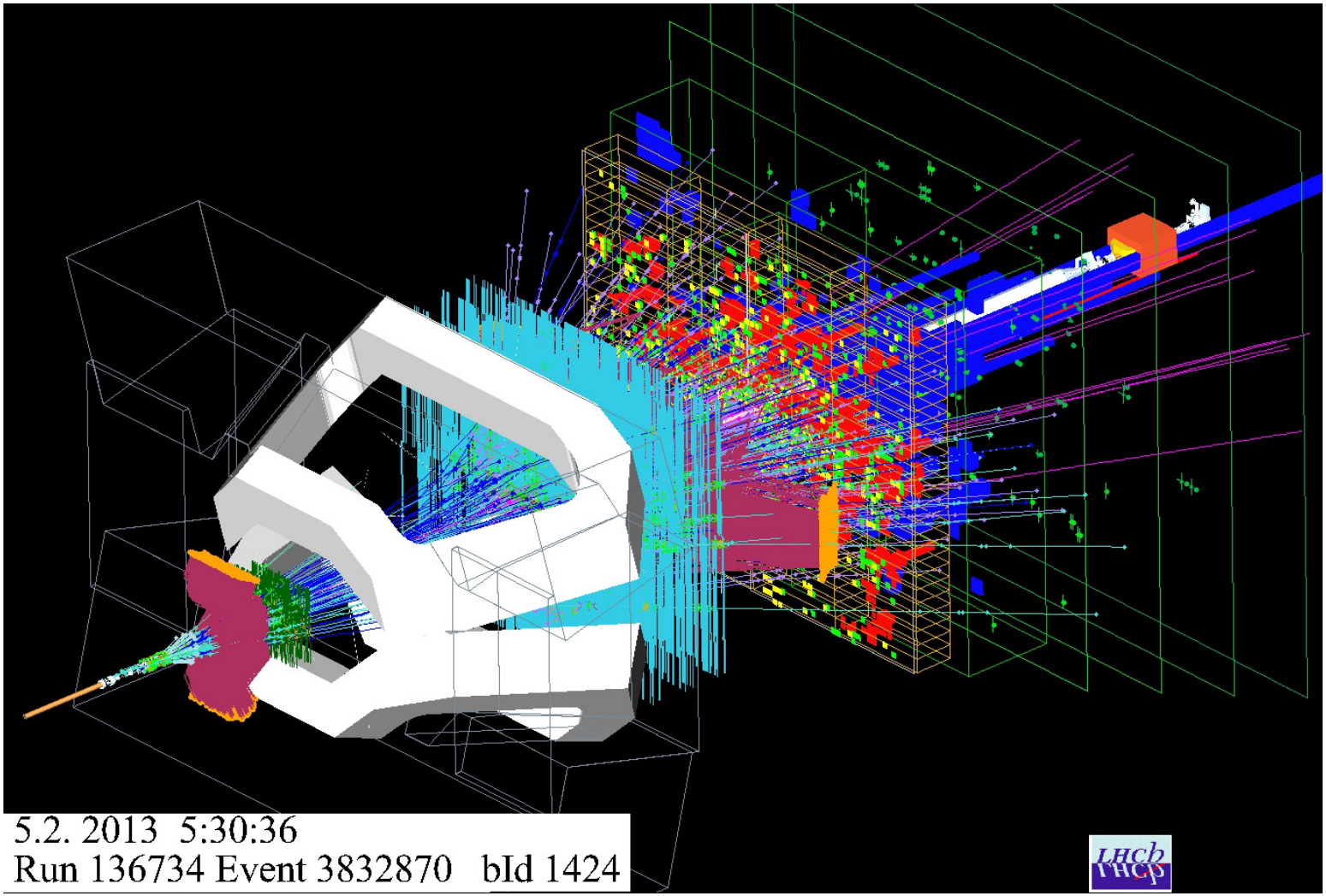
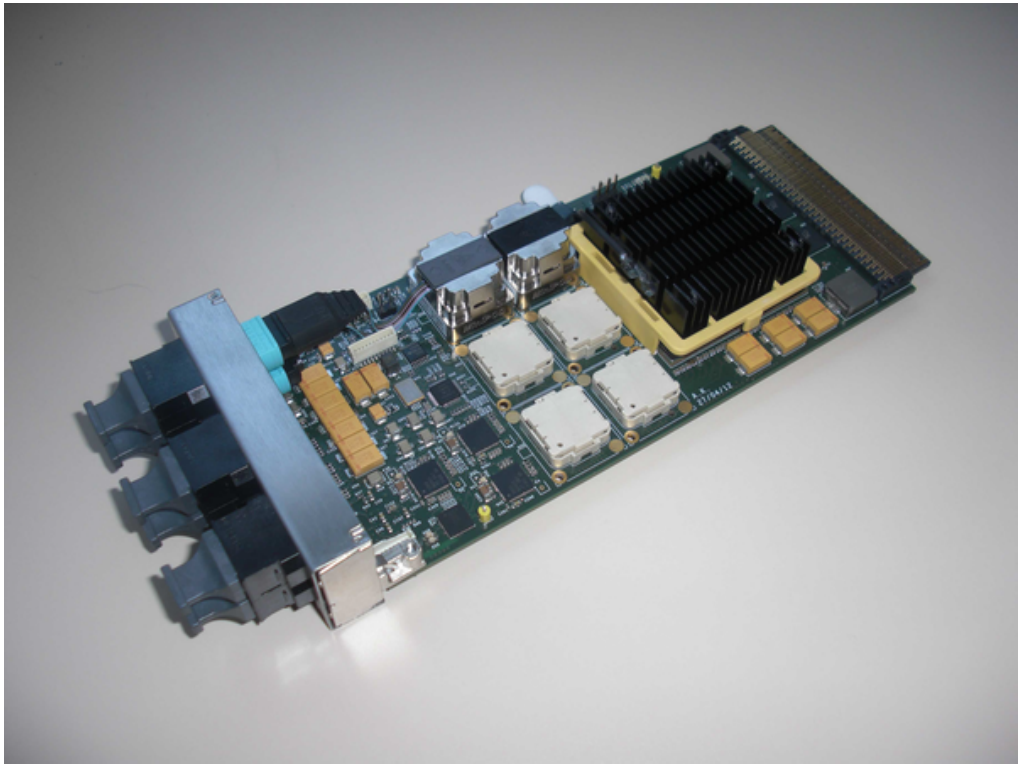
Current detector



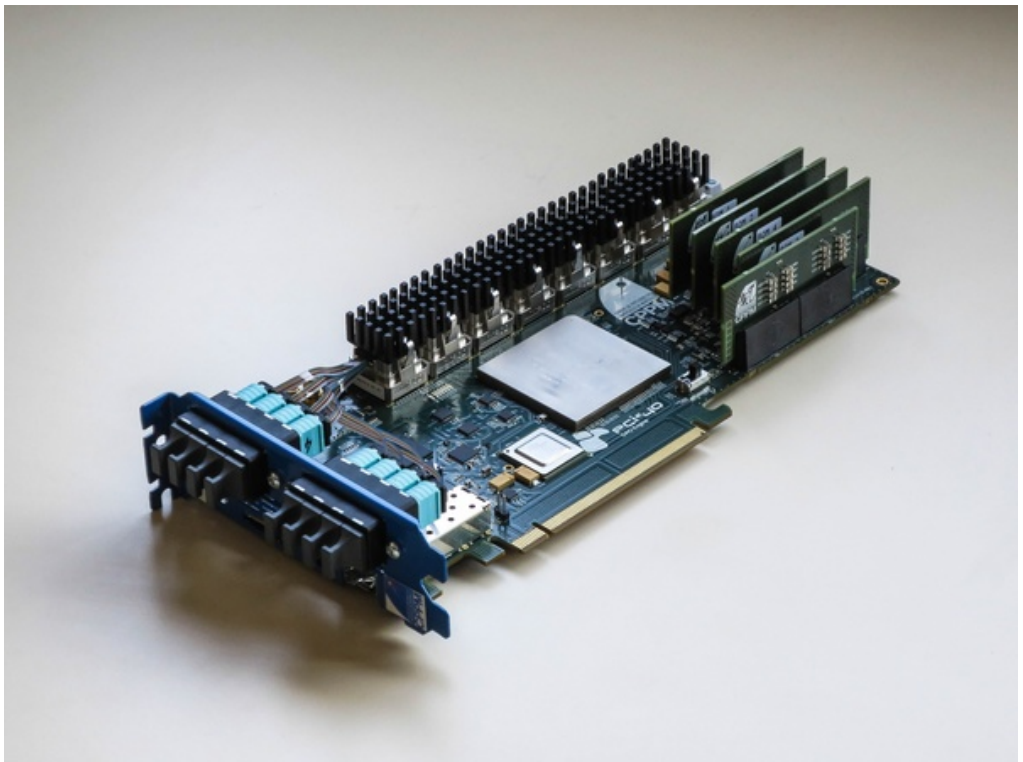
Source: https://cds.cern.ch/journal/CERNBulletin/2013/08/NewsArticles/1514560

Current prototype board: AMC40



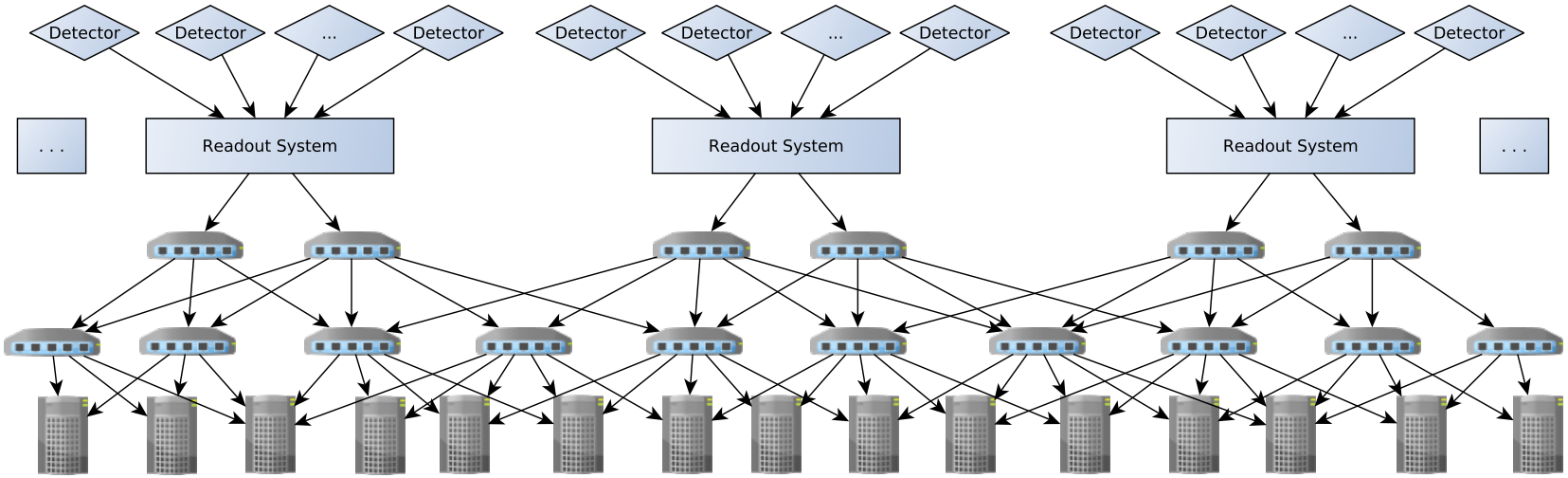
- FPGA connected to CPU over Ethernet
- 100 Gbit/sec per board
- Current prototype for detector R&D

New prototype board with PCIe40



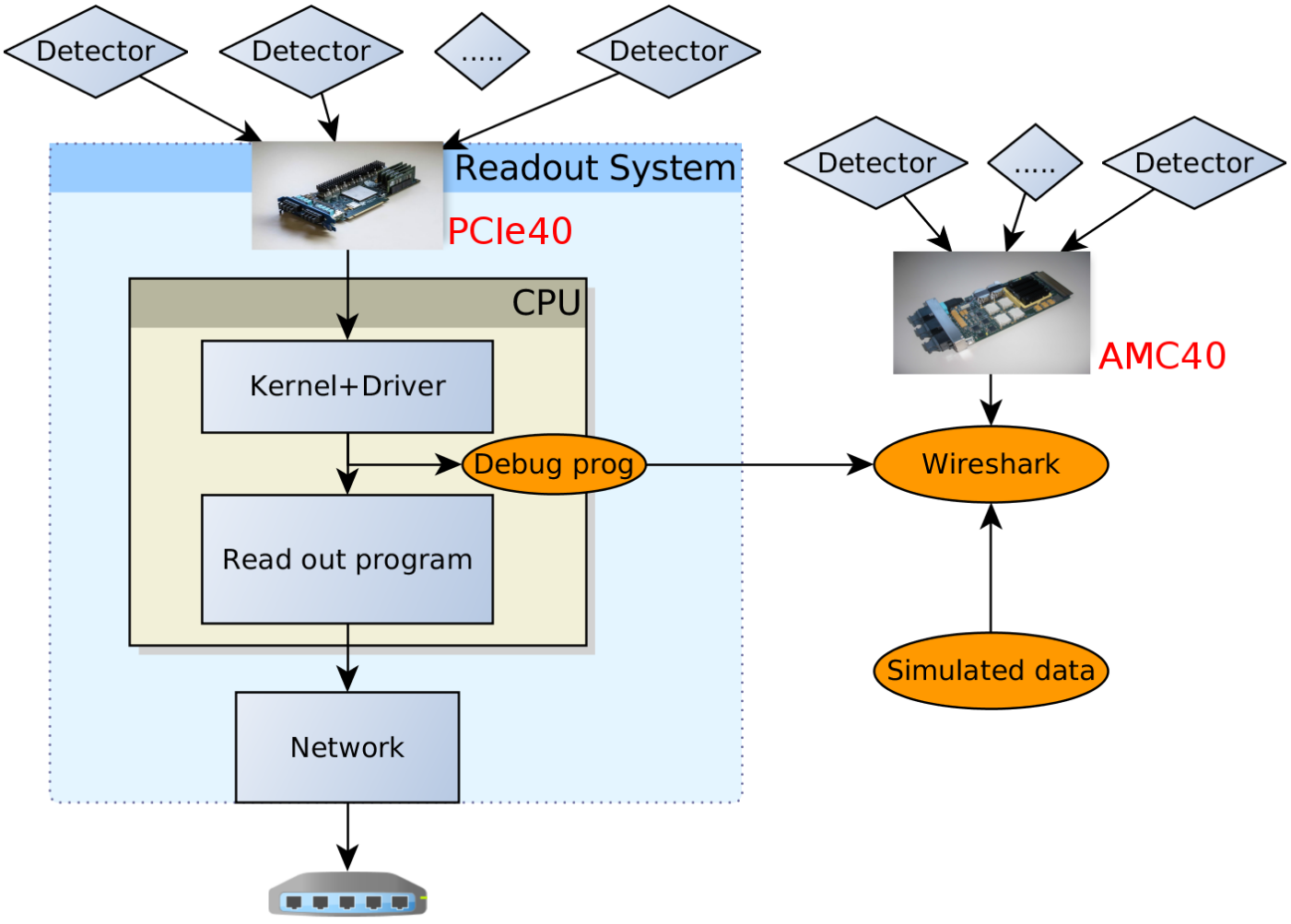
- FPGA connected to CPU over PCIe with 16 lanes instead of Ethernet
- 100 Gbit/sec
- PCIe: stable interface

Connection new detectors to storage backend

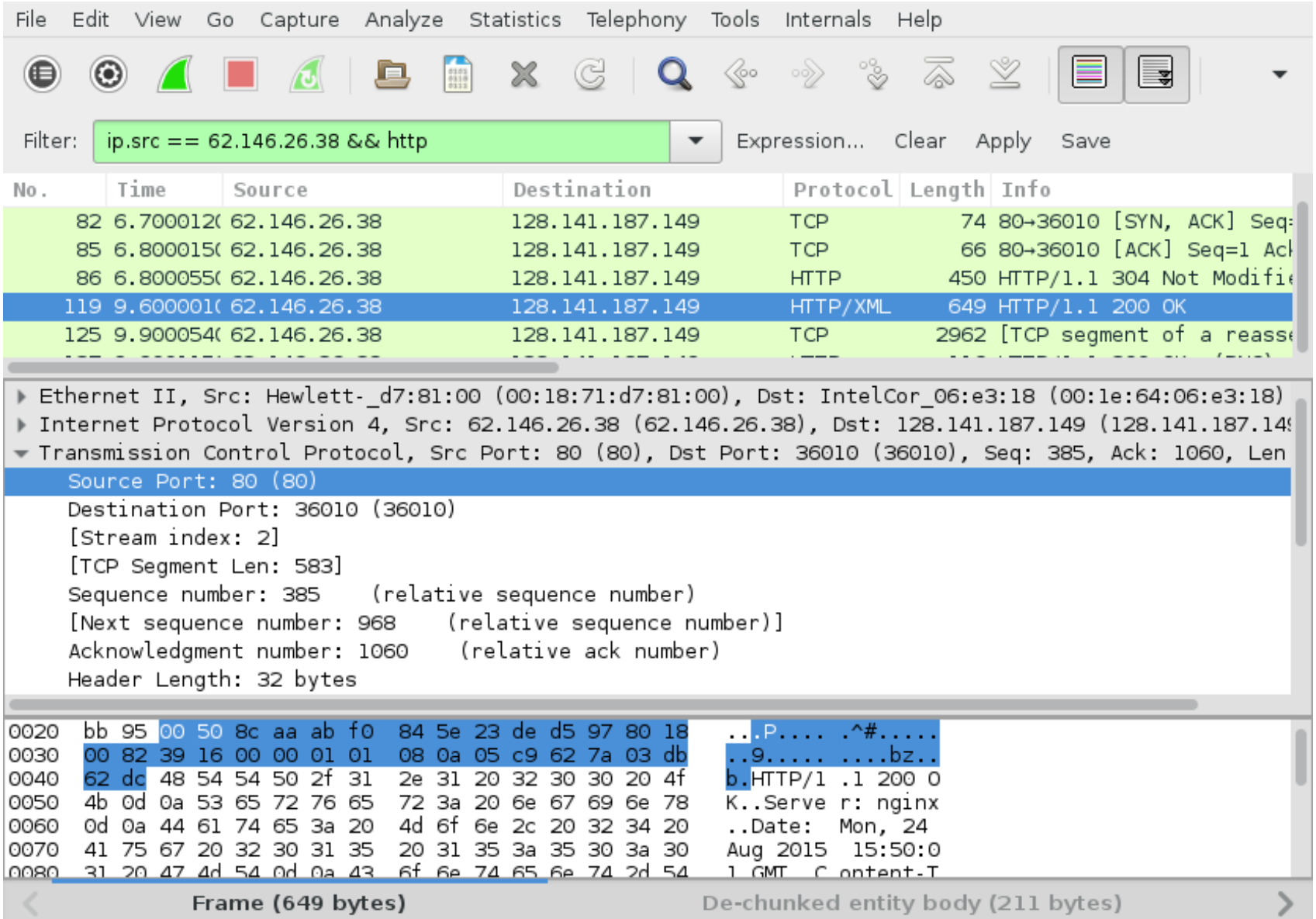


- 500 boards
- ≈ 12000 detector links
- 40 TBit/sec

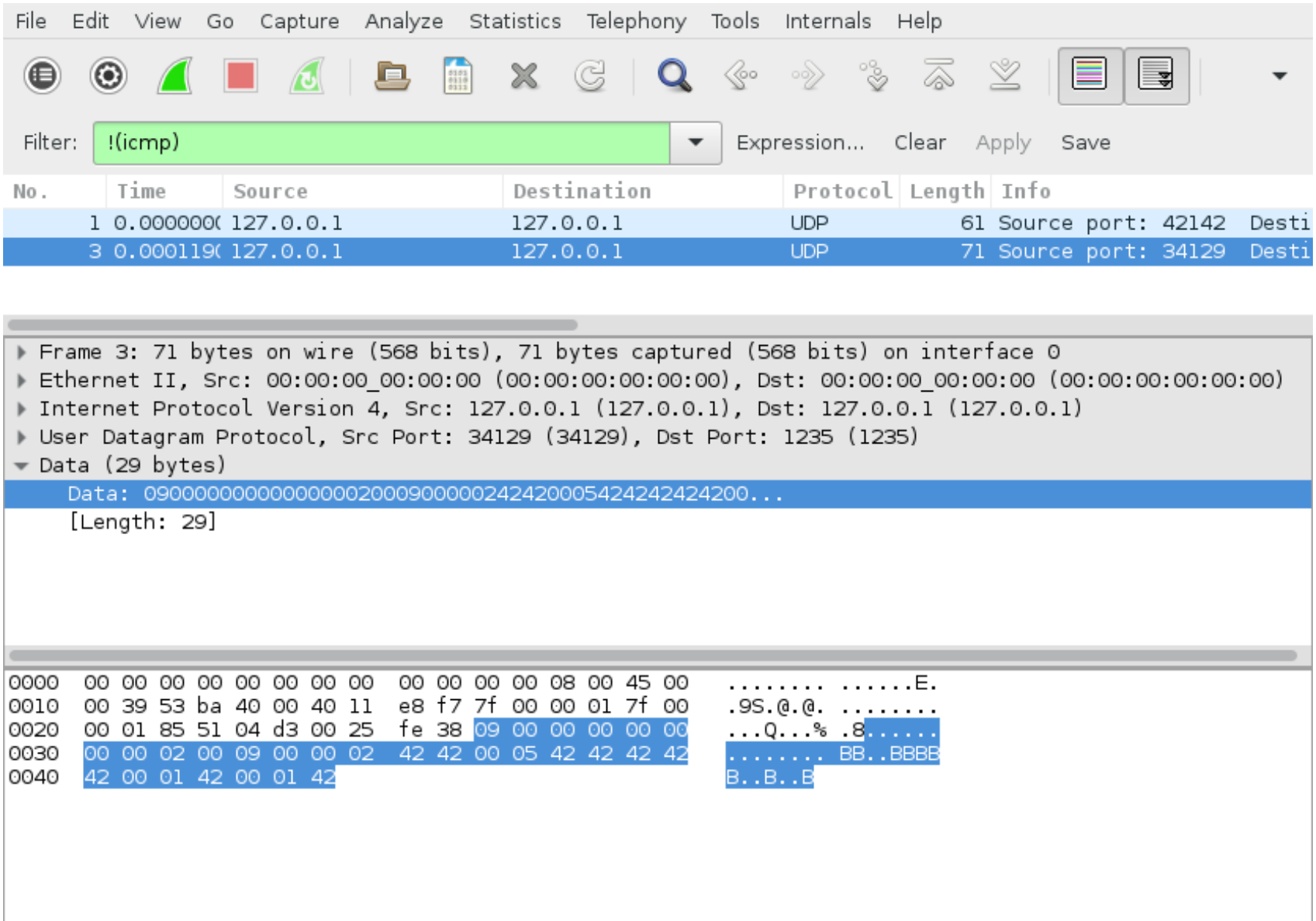
Openlab Summer project tasks



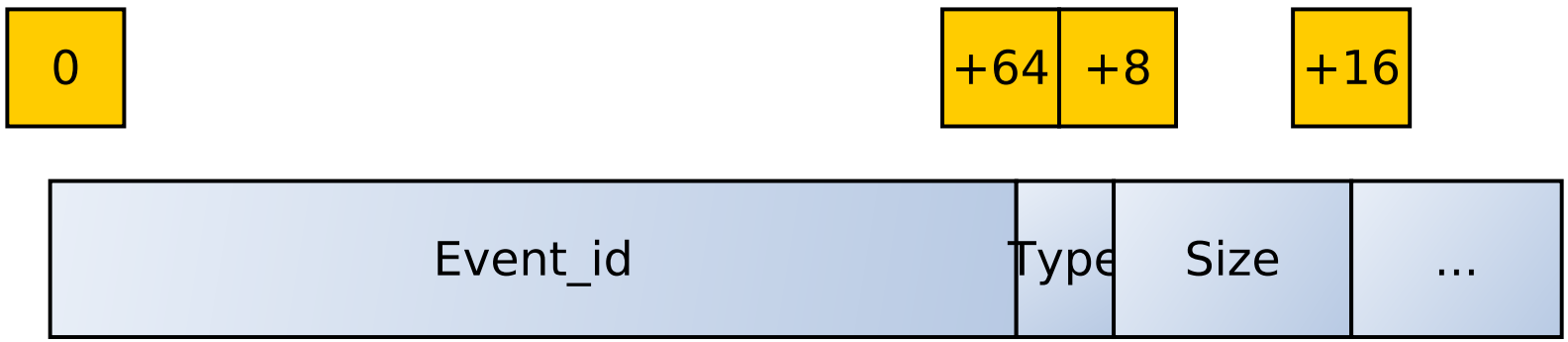
Wireshark dissecting HTTP



Without MEP dissector



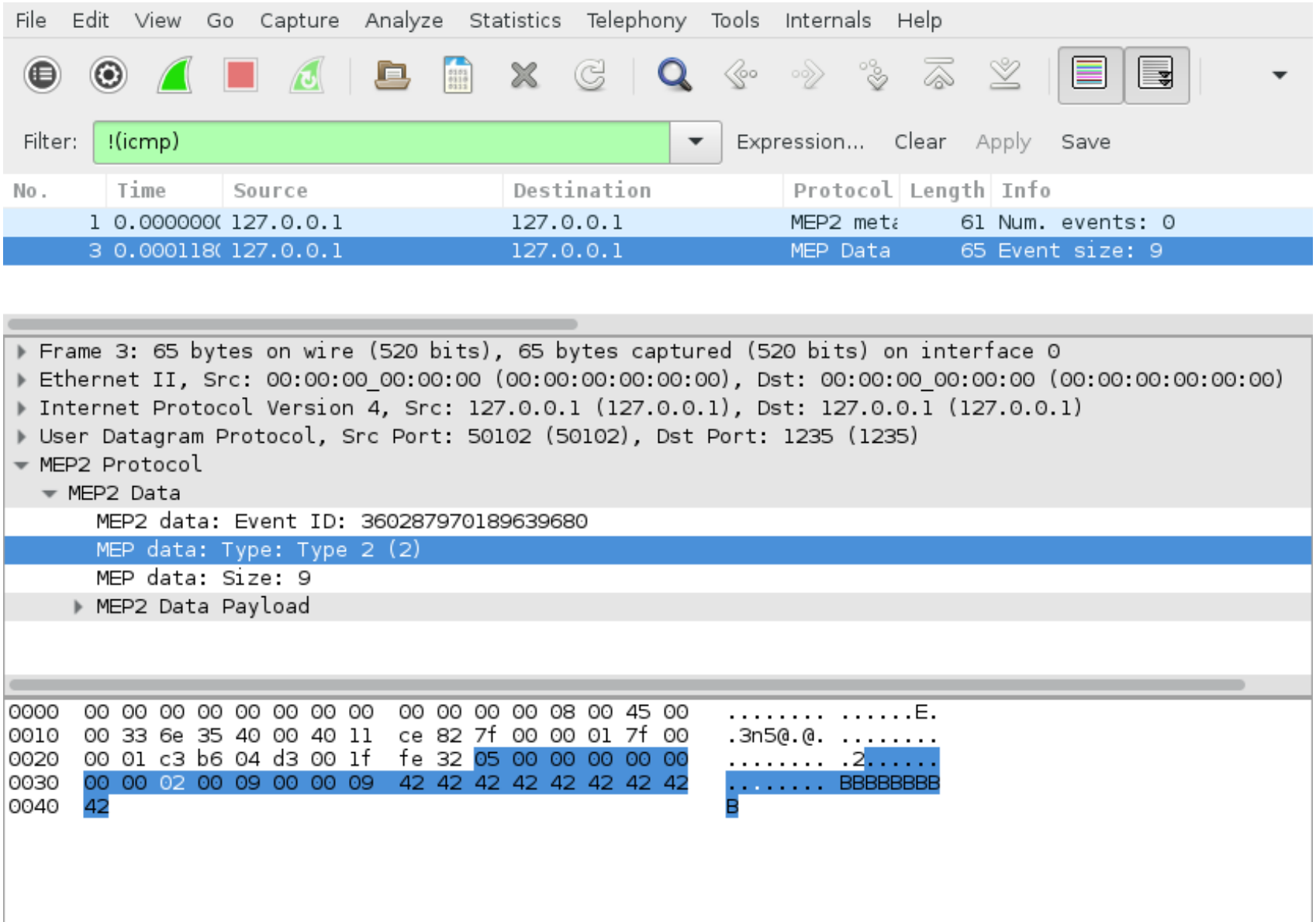
Protocol



A basic wireshark dissector

```
static void dissect_mep(tvbuff_t *tvb, packet_info *pinfo,
    proto_tree *tree) {
    gint offset = 0;
    ...
    proto_tree *data_tree = proto_item_add_subtree(data_root,
            ett_data);
    proto_tree_add_item(data_tree, hf_data_evid, tvb, offset,
            8, ENC_BIG_ENDIAN);  // 64bit = 8 byte
    offset += 8;
    proto_tree_add_item(data_tree, hf_data_type, tvb, offset,
            1, ENC_BIG_ENDIAN);
    offset += 1;
    proto_tree_add_item(data_tree, hf_data_size, tvb, offset,
            2, ENC_BIG_ENDIAN);
    offset += 2;
    ...
    }
}
```

With MEP dissector



Happy Supervisor

Accomplished tasks

- `https://github.com/chrysh/lhcb-daq40-dissector`
  - Wireshark dissector
  - C program as link between kernel driver and wireshark
- Wikipage for future reference

Thank you for the experience!