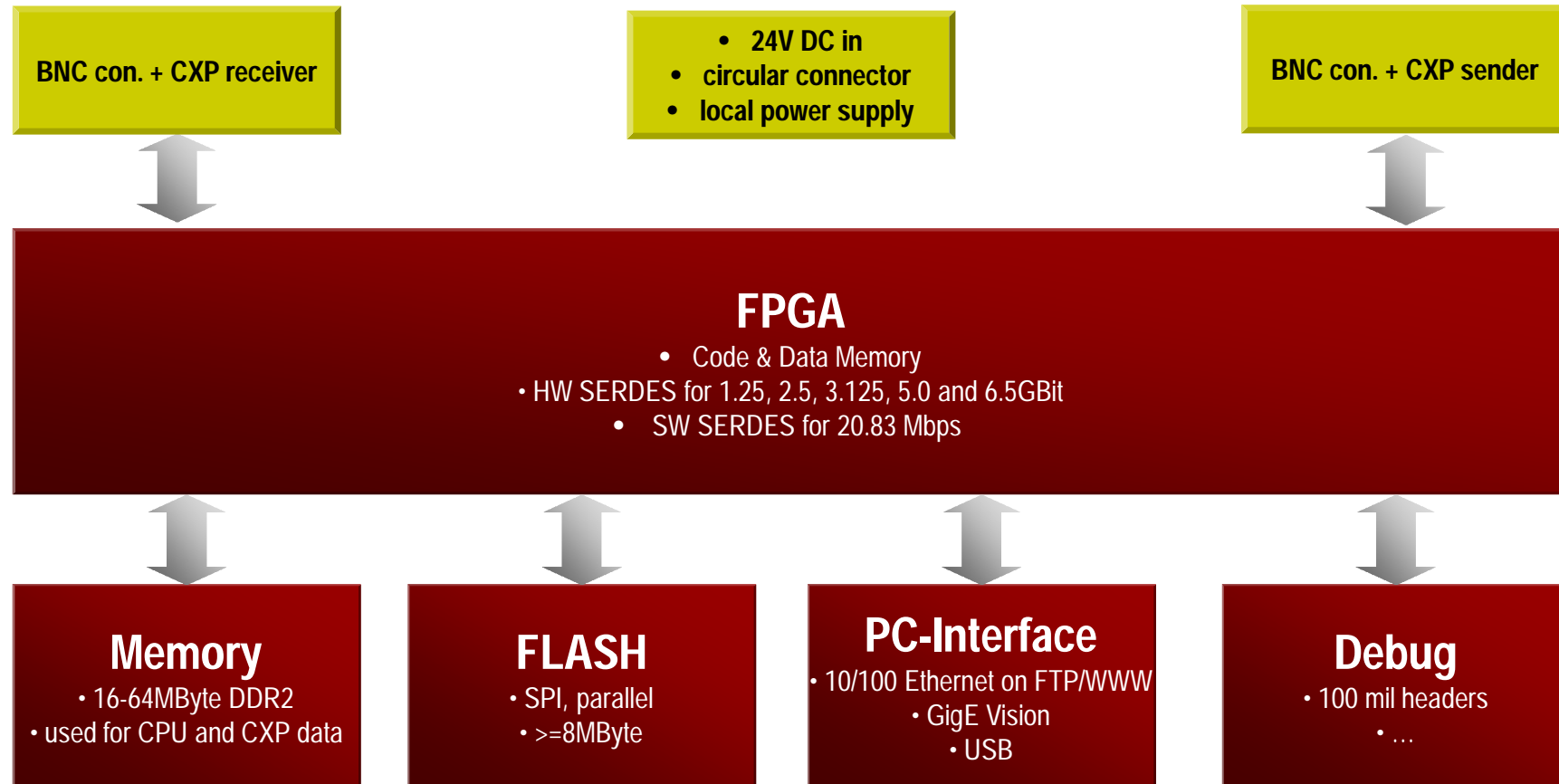
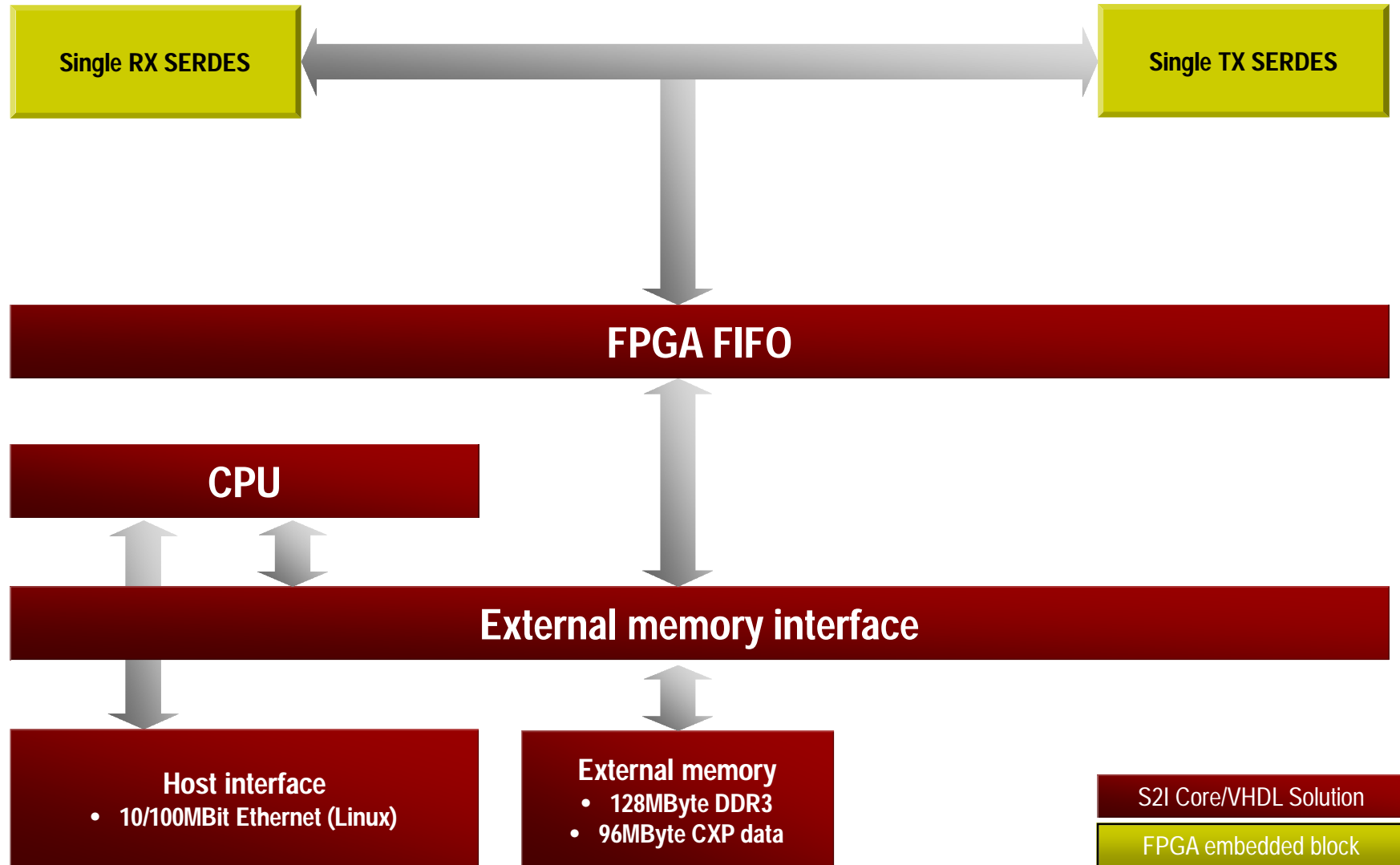


# CXP Protocol viewer

## HW external components

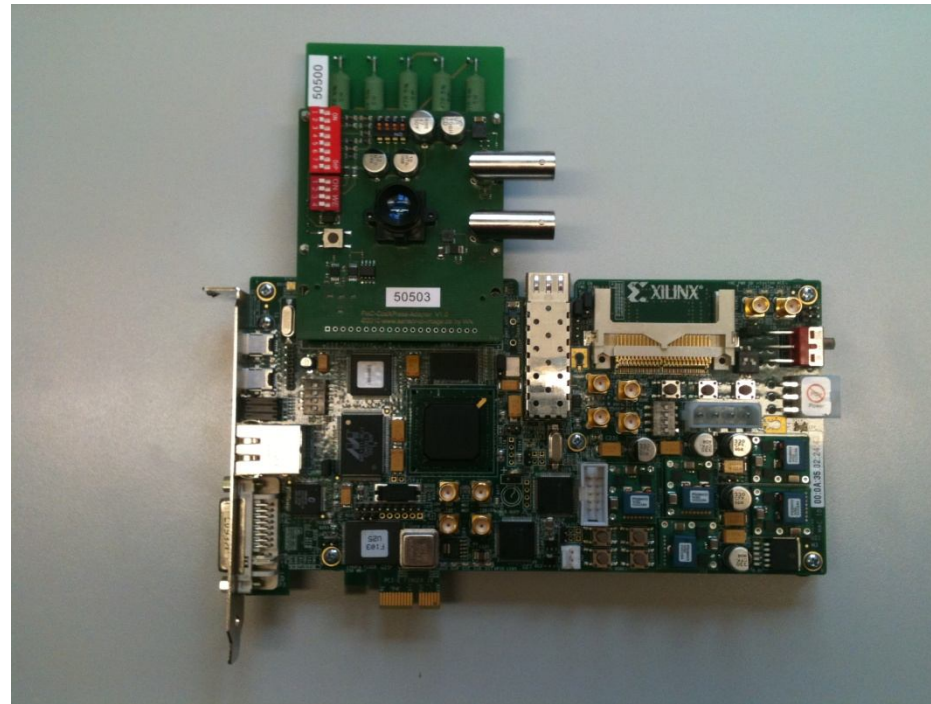


# TestHW basic system



# Current status Vision 2011

- reference LINUX implementation from S2I on SP605 done
- Snooper board 1.1 physically tested
- CXP dump, FTP transfer, console interface done
- CXP dump data import to Whireshark done



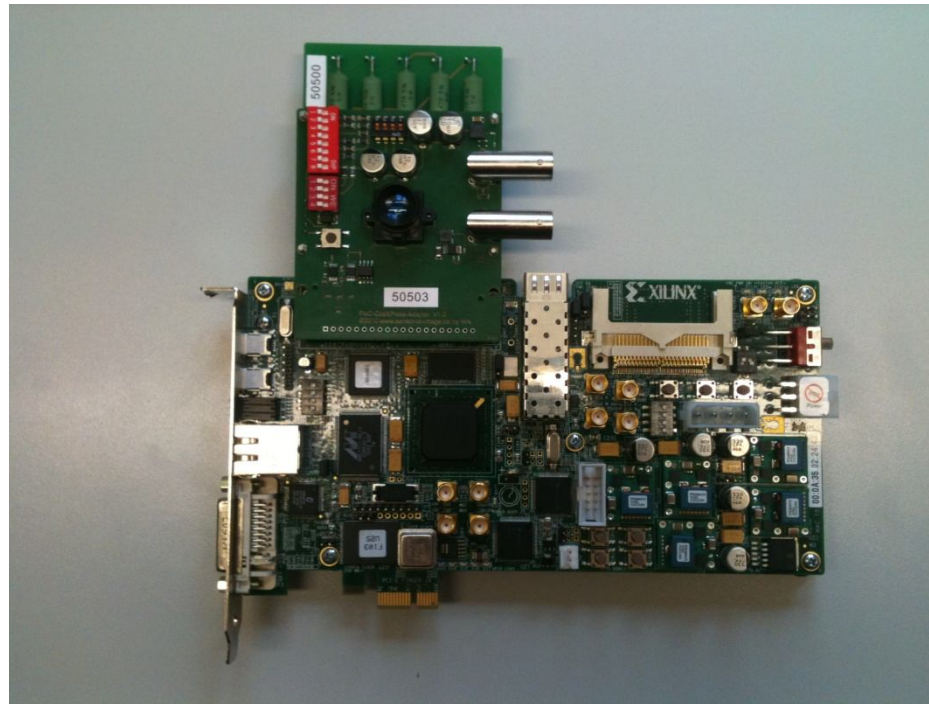
# SNOOPER in action

- Software on SP605:
  - FTP server for PC data transfer
  - CXP controller
- CXP controller features:
  - CXP line speed
  - CXP trigger conditions: uplink data/trigger/GPIO/IO-Ack.
  - CXP trigger conditions: downlink frame start
  - CXP data capture with 8% pretrigger
- PC software project1:
  - PC Data2PCAP data transfer and Wireshark format conv.
- PC software project2:
  - cxp.dll, Wireshark Plugin → protocol analyzer
  - is a viewer today, can be a analyzer tomorrow

How to use it :  
Putty to SP605:      cxpctl cap  
cmd window:        data2pcap → convert cxp.dum to cxp.pcap  
Wireshark:         Import cxp.pcap to display the dump data

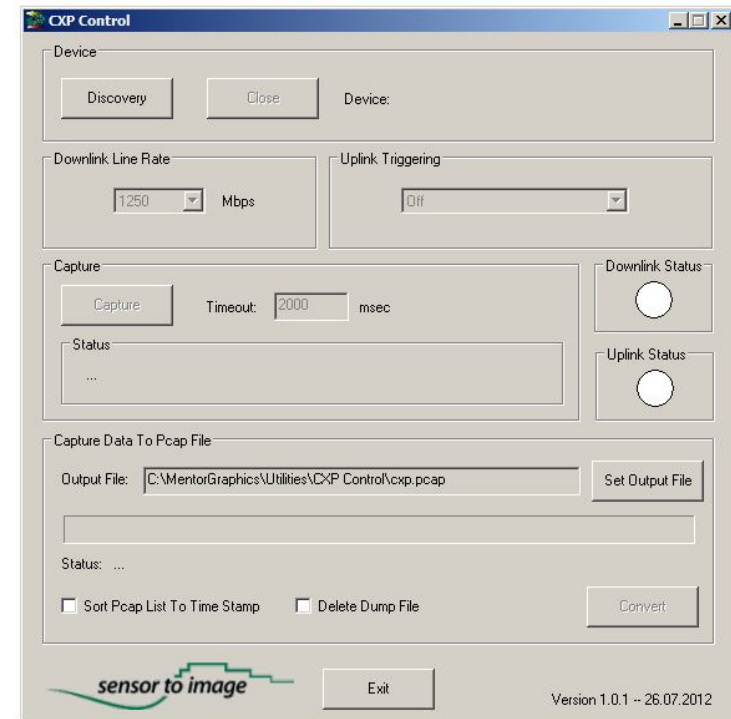
# Current status Vision 2012

- reference LINUX implementation from S2I on SP605 done
- Snooper board 1.2 physically tested, passed ECT testing
- Simplified WIN user interface, dropped LINUX
- CXP dump data import to Whireshark done



# SNOOPER in action

- Software on SP605:
  - FTP server for PC data transfer (invisible)
  - CXP controller (invisible)
- CXP controller features:
  - CXP line speed
  - CXP trigger conditions: uplink data/trigger/GPIO/IO-Ack.
  - CXP data capture with 8% pretrigger
- PC software project1:
  - CXPControl.exe:
    1. operate SNOOPER
    2. transfer data
    3. converter data to PCAP format





# Wireshark display

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
1217	13.020319	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 235
1218	13.029999	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 236
1219	13.047840	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 237, Line Marker
1220	13.057360	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 238
1221	13.067039	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 239
1222	13.076639	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 240
1223	13.086160	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 241
1224	13.095839	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 242
1225	13.105359	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 243
1226	13.115040	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 244
1227	13.132879	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 245, Line Marker
1228	13.142399	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 246
1229	13.144879	Host	Device	CXP	26	Control Command Packet: Memory Read -> Address 0x04000000
1230	13.151999	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 247
1231	13.161600	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 248
1232	13.171199	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 249
1233	13.180880	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 250
1234	13.190400	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 251
1235	13.208239	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 252, Line Marker
1236	13.217759	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 253
1237	13.227440	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 254
1238	13.237040	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 255
1239	13.246639	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 0
1240	13.256240	Device	Host	CXP	162	Stream Data Packet: Stream ID -> 1, Packet Tag: -> 1

0000 00 00 fb fb fb fb 01 01 01 01 01 01 01 f6 f6 .....  
0010 f6 f6 00 00 00 00 20 20 20 20 ff ff ff ff ff ff .....  
0020 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff .....  
0030 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff .....  
.....

File: "C:\Temp\cxp-test1.pcap" 698 KB 00:00:46 Packets: 4017 Displayed: 4017 Marked: 0 Load time: 0:00.203 Profile: Default

Start | cxp-test1.pcap [Wir... | 00:06





# SNOOPER sample 2 of compliant product

The screenshot shows a network analysis tool interface. At the top, there is a menu bar with options: File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Tools, Internals, Help. Below the menu is a toolbar with various icons for file operations, search, and navigation. A filter bar is set to 'cxp.direction'. The main window displays a table of captured packets:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Host	Device	CXP	30	Control Command Packet
2	0.000015	Device	Host	CXP	18	Control Acknowledge Packet
3	0.200239	Host	Device	CXP	30	Control Command Packet
4	0.200255	Device	Host	CXP	18	Control Acknowledge Packet
5	0.401599	Host	Device	CXP	30	Control Command Packet
6	0.401616	Device	Host	CXP	18	Control Acknowledge Packet

Below the table, a detailed view of a selected packet is shown. It includes the following information:

- [Frame is ignored: false]
- [Protocols in frame: cxp]
- [Coloring Rule Name: CXP-Downlink]
- [Coloring Rule String: cxp.direction == 0]
- ▼ CXP Protocol
  - Direction: Downlink
  - Interrupted: No
  - Packet Type: Start Of Data Packet (0xfbfbfbf)
  - Sub Packet Type: Control Acknowledge Packet (0x03030303)
  - Code: 0x46464646 -> Incorrect size received, Message size is inconsistent with message size indicat.
  - Packet Type: End Of Data Packet (0xfdfdfdfd)

At the bottom, a hex dump of the packet data is shown:

```
0000 00 00 fb fb fb fb 03 03 03 03 46 46 46 46 fd fd ..... ..FFFF..
0010 fd fd
```

The status bar at the bottom indicates: Text item (text), 4 bytes. Packets: 6 Displayed: 6 Marked: 0 Load time: 0:00.027 Profile: Default.

# SNOOPER ToDo list

- Downlink trigger modes ?
- Link speed detection -> missing part in CXP specification!
- Multiple connections ?
- Speed ?
- Price ?

Feature feedback from CXP meeting 6. December 2012:

- Trigger on wrong uplink/downlink CRC
- Trigger on wrong uplink/downlink packets
- ... more input is welcome!

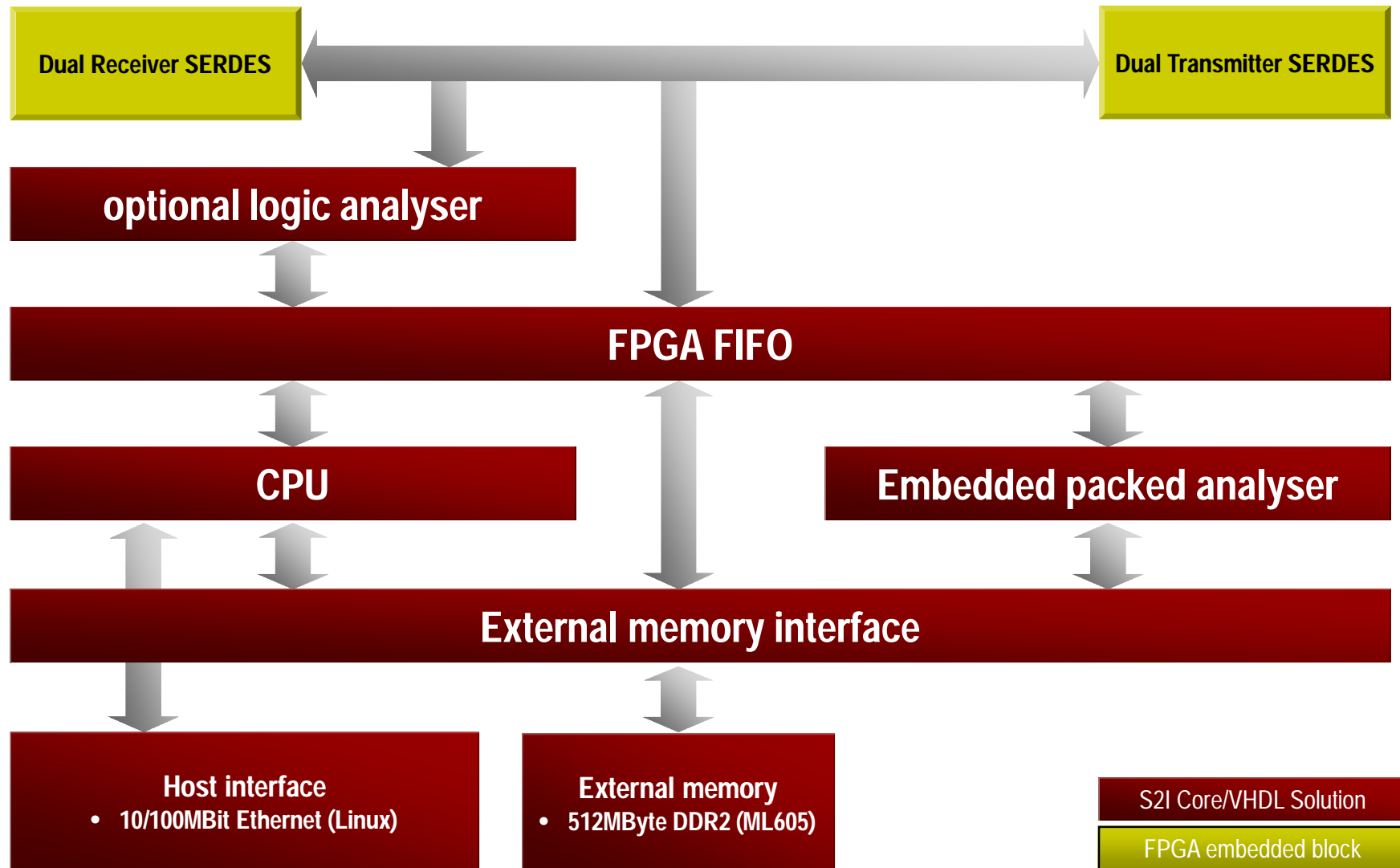
Roadmap from S2I for 2013:

- new FMC board with 2/4 CXP In/Out based on ML605 or KC705 -> more speed/multi lane cameras
- with new FMC port SNOOPER to ML605 or KC705, but not as the same price as board is 1000US\$ more expensive than SP605
- **!! Volunteers are welcome at any time to work on the project to make it open source !!**

# SNOOPER in compliance testing !?

- Basic Read/Write on CMD channel
- Basic image headers
- Reason for this is work with several camera and frame grabber vendors since Plugfest Yokohama December 2012
- Reason for this is work with products which passed a Plugfest, but do in a obvious way do not comply with the standard
- Reason for this is to get well working products which can interact well in the field

# TestHW advanced system





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