Features

This UDP implementation provides UDP communication using two UDP ports: for register access and for upstream channel. The 40/100G Ethernet interface uses a 10/25G capable quad MGT as well as 4 lanes optical transceiver (QSFP+, Firefly etc.).

This UDP implementation supports following protocols with some restrictionns:

- UDP with headCRC=0
- Ipv4 without packet fragmentation (UDP packets limited to 1472 bytes)
- no ICMP support (e.g. ping)
- ARP reduced to reply to request packets only *)
- Ethernet.
- Static network configuration (no DHCP): **mac address AA:BB:CC:DD:EE:FF ip 192.168.1.100**
- Autonegotiation is disabled

*) -> The PC must initiate the communication by sending a UDP packet first for each UDP port, before FPGA can use it.

Jumbo Frames

???????????

Register Access

This service is used for FPGA parameterization as single read/write acess to an internal 32bit register space based on simple acsii-hex syntax.

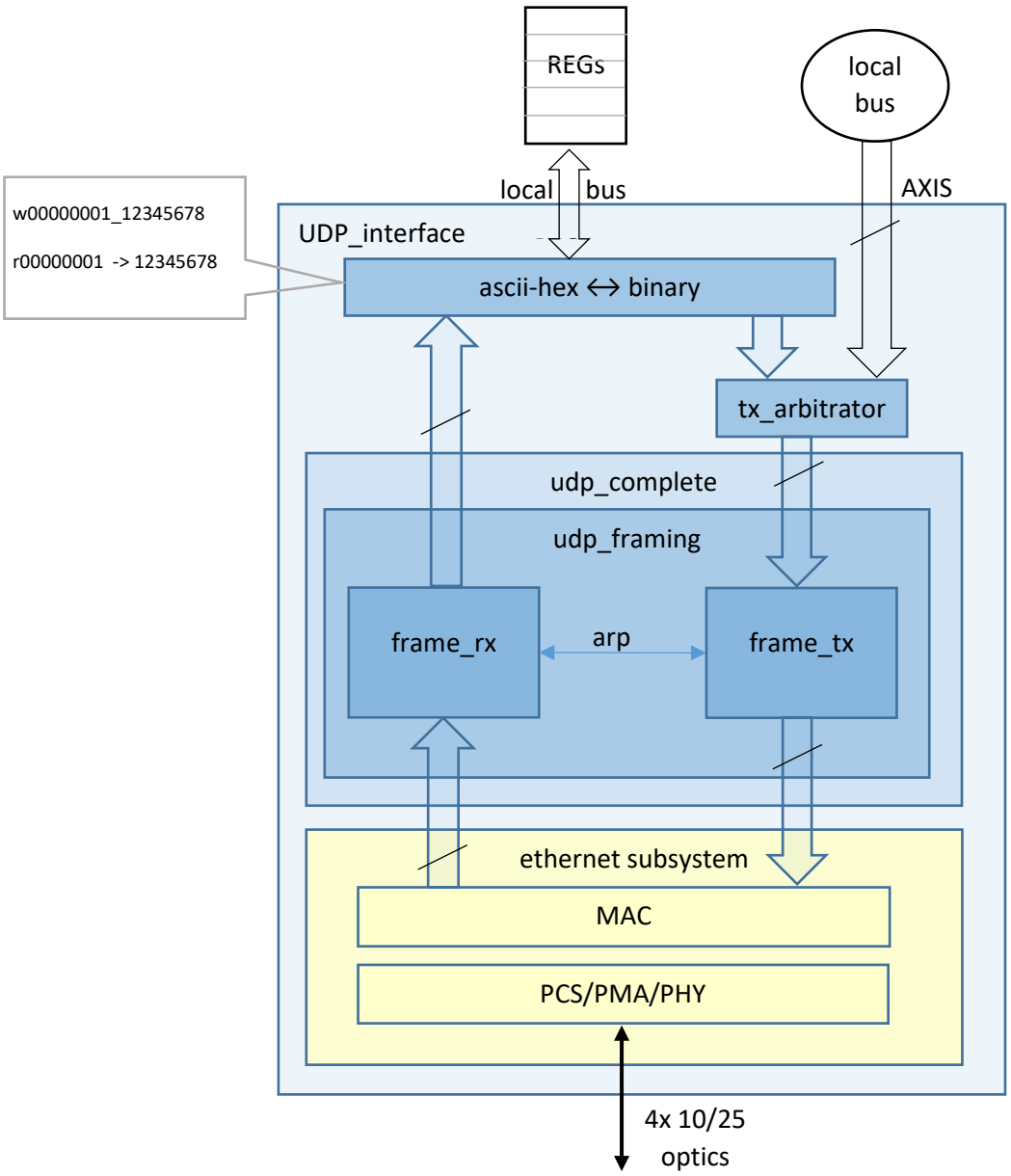
WRITE command: wAAAAAAAA_DDDDDDDD
e.g. w00000007_12345678 writes 0x12345678 data to adress 0x00000007

READ command: rAAAAAAAA
e.g. r00000007 reads from the adress 0x00000007, FPGA answers with 12345678<CR>

Upstream Channel

This channel uses binary 512bit data stream to transmit (triggered/event) data to PC. The length of such packets is either fixed or pre-defined by user. Note that PC should initiate a (dummy) transfer to the streaming port before to announce its mac+ip+port addresses/number.

Block Diagram



MAC DEST	MAC SRC	Eth Type	Vers IHL	TOS	Total length	ident	Flags Fragm	TTL	Prot ocol	Head crc	IP Src	IP Dest
6	6	2	1	1	2	2	2	1	1	2	4	2

IP Dest	Port Src	Port Dest	length udp	head crc	data	frame crc
2	2	2	2	2	18 bytes: wXXXXXXXX_YYYYYYYY	4

Register Map

#	offset	size	name		description	def.
0		uint32	Version	ro	project, version, revision, geao address etc.	
1		uint32	Command	wo	self-cleared bits	0
2		uint32	UserIntrptMask	r/w		FF
3		uint32	UserIntrptSource	ro		
4		uint32	streamPort	r/w	[15:0]	
5		uint32	M_period	r/w	send packet every … in 322.265625 MHz ticks	0
6		uint32	N_size	r/w	packet length in bytes	0
7		uint32	RunControl	r/w	bit0 - enable tranmit bit1 – led on/off	0
16		uint32	Status	ro	status flags t.b.d.	

Example

```
netcat -u4 192.168.1.100 5000
>w00000004_00001389                    // set streaming port to 5001 (0x1389)

netcat -u4 192.168.1.100 5001
>r00000004                         // dummy access read or write

netcat -u4 192.168.1.100 5000
>w00000005_40000000                    // period = 0x40000000*3.1ns= 3,3s
>w00000006_00000200                    // packet length = 512 bytes
>w00000007_00000001                    // start generator
…
>w00000007_00000000                    // stop generator
```