E-bone
BRAM / FIFO interface

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1 Description

ebs_bram core interfaces a BRAM (internal) memory to E-bone.

The memory (not included in this IP) is assumed to be of type BRAM (true memory or FIFO) with the following features:

- Pipeline delay is assumed to be exactly 2 clock cycles (Registered output does it);
- 32 bit maximum address bus;
- In case of FIFO the type must be “standard” (not fall-through).

Regarding FIFO interfacing none of the usual (empty, full) flags are supported. But still the *ebs_bram* core may be used to read or write a FIFO type memory as long as the application is managing the flags as appropriate. For a complete FIFO management, see the *ebs_fifo* core.

When accessing true memory if the address comes out of range, the burst aborts.

2 Source files

ebs_bram.vhd	top level
ebs_bram_pkg.vhd	package (for component declaration)

3 Generics

Name	Type	Description
EBS_AD_BASE	natural	E-bone segment
EBS_AD_RNGE	natural	Addressing range (number of bits)
EBS_AD_SIZE	natural	Must be power of 2, minimum 4. Memory size. WARNING! In the FIFO case it determines the longest possible burst size.
EBS_AD_OFST	natural	Offset in segment
EBS_DWIDTH	natural	Interconnect width

4 Ports

Name	Dir.	Type	Description
eb_XXX			E-bone compliant slave
ebx_XXX			E_bone extensions slave Message related signals are *not* used. *ebx_dsz_o* does report on actual data width.
mem_rd_o	out	std_logic	Memory (FIFO) read enable
mem_wr_o	out	std_logic	Memory (FIFO) write enable
mem_addr_o	out	std32	Memory address
mem_dout_i	in	std_logic_vector	Memory data read port
mem_din_o	out	std_logic_vector	Memory data write port

Message signals are not used, they may be connected as follows (single slave):

```
ebx_msg_set_i => GND8,     -- not used, message management
ebx_msg_dst_o => OPEN,     -- zero, message destination
ebx_msg_dat_o => OPEN,     -- zero, message data
```

However in case there are multiple slaves, the (null) message outputs should be connected to the extensions core interconnect.

5 Revision history

Rev.	Date	Who	Comment
1.0	10/09	herve	1st release
1.1	08/10	herve	Updated to E-bone 1.1 Added FIFO interface
1.2	04/11	herve	Updated to E-bone 1.2 Removed *mem_fifo_i* port; added FIFO retry.
1.3	01/12	herve	Check size 2**N
1.4	12/12	herve	Removed FIFO flags (since ebs_fifo was created)
1.5	02/13	herve	E-bone extensions for data width reporting