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CME 435 – Lab 4

Packet DeMultiplexer (PDM) features that require verification

1. BND_PLSE must be asserted (high) coincident (at the same time) as the first packet byte.

2. BND_PLSE must be asserted (high) coincident (at the same time) as the last packet byte.

3. Upon the assertion of reset (low), all outputs must be driven low
   1. ACK
   2. NEWDATA_LEN_x
   3. DATA_OUT_x

4. Within 1-4 cycles of the packet-terminating assertion of BND_PLSE on the input interface, the packet payload size (which excludes the destination port byte) shall be asserted for a single cycle on the NEWDATA_LEN_x bus.

5. On the next cycle after the PROCEED_x assertion, the PDM shall drive all packet payload bytes on the DATA_OUT_x bus without interruption and in the order received on the input interface until all payload bytes have been driven.

6. The first byte of each packet received on the input interface, which indicates the destination output port, is stripped off before the packet is forwarded to the appropriate output interface.

7. ACK shall be asserted for a single cycle within 1-4 cycles of the packet-terminating assertion of BND_PLSE.

Testcases

1. **testbench_sanity_check:** Confirms general operation *(features 4, 5, 6, 7)*

2. **testbench_buffer_overflow:** Confirms that repeatedly sending large and small payloads on the same output port doesn't break the PDM

3. **testbench_BND_PLSE_coincidence:** Confirms BND PLSE coincidence with first and last payload bytes *(features 1 & 2)*

4. **testbench_MAX_payload:** Confirms that the max payload size (16 bytes) works even after continuous sending

5. **testbench_MIN_payload:** Confirms that the min payload size (4 bytes) works even after continuous sending

6. **testbench_reset:** Confirms that ACK, NEWDATA_LEN_x, and DATA_OUT_x are cleared on reset *(feature 3)*