

### 7.7.3 FIFO with data width conversion

In some applications, the widths of the write port and read port of a FIFO buffer may not be the same. For example, a subsystem may write 16-bit data into the FIFO buffer and another subsystem only reads and removes 8-bit data at a time. Such FIFO buffers are called asymmetric buffers. Assume that the width of the write port is twice the width of the read port. Redesign the FIFO with a modified controller and register file and verify its operation.

The `DATA_WIDTH` generic parameter should be the width of the read port and should be used as the `DATA_WIDTH` of the register file.