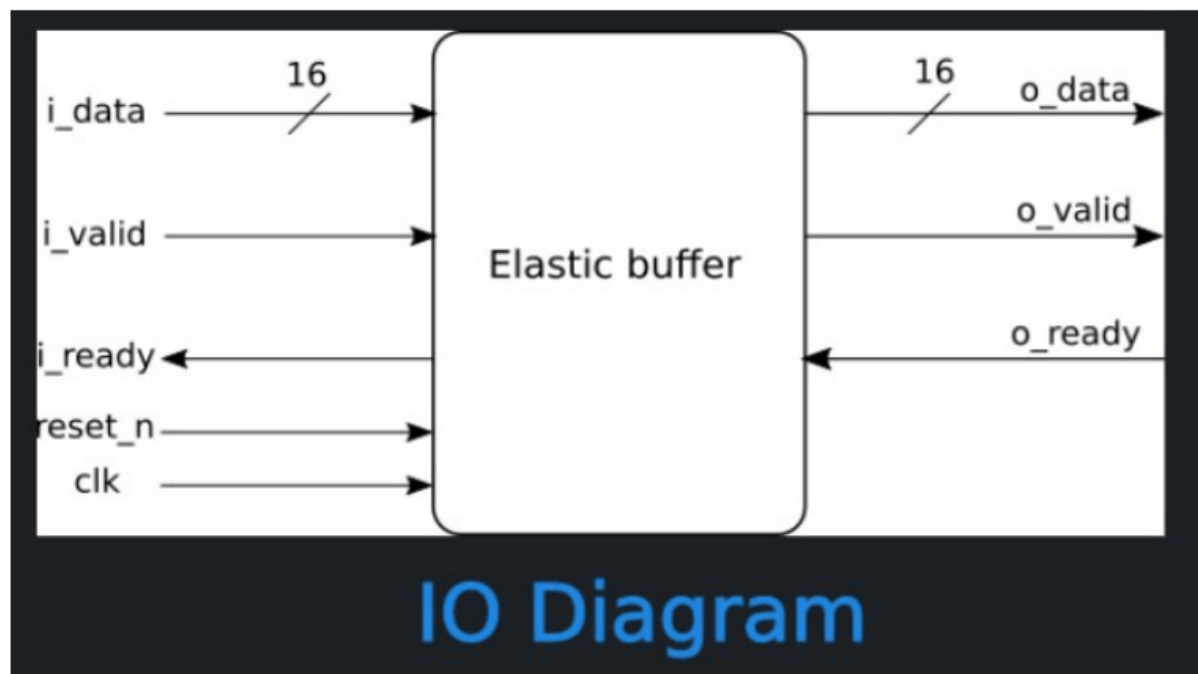# Elastic buffer

Eridan pre-screening

Overview

- Elastic buffer is a module that helps transfer data between devices
- Single clock domain
- Handles ready valid handshake
- Input data is of variable width and is set on instantiation
- Reset is synchronous and active on LOW

IO Diagram

Pin - out

Signal name	Type	Description
clk	I	Data clock used with i_data input and o_data output
rst_n	I	System reset active LOW
i_valid	I	Validity of input data
i_data [DATA_WIDTH : 0]	I	Input data
i_ready	O	Readiness of buffer to accept new data
o_valid	O	Validity of output data
o_data [DATA_WIDTH : 0]	O	Output data

Signal name	Type	Description
o_ready	I	Readiness of output to accept new data

Functional Description

Buffer is receiving variable width of data and is set at instantiation.

Except data, buffer has two more input signals, i_valid and o_ready. Buffer will receive new data only when i_valid signal is set HIGH. Then, from the next clock cycle, he is ready to send it and awaits o_ready signal. In same clock cycle when o_ready is received, and buffer holds valid data, that data is sent. When sending valid data, o_valid signal must be set HIGH as well.

In cycle when buffer has valid data to send, but o_ready signal is LOW i_ready must be set LOW as well, for buffer is not yet ready to accept new data. When that data is sent, i_ready is set back to HIGH.

Reset is active LOW and initialize all output signals to 0.