Overview

The IObundle UART is a RISC-V-based Peripheral written in Verilog, which users can download for free, modify, simulate and implement in FPGA or ASIC. It is written in Verilog and includes a C software driver. The IObundle UART is a very compact IP that works at high clock rates if needed. It supports full-duplex operation and a configurable baud rate. The IObundle UART has a fixed configuration for the Start and Stop bits. More flexible licensable commercial versions are available upon request.

Features

- Supported in IObundle's RISC-V IOb-SoC open-source and free of charge template.
- IObundle's IOb-SoC native CPU interface.
- Verilog basic UART implementation.
- Soft reset and enable functions.
- Runtime configurable baud rate
- C software driver at the bare-metal level.
- Simple Verilog testbench for the IP's *nucleus*.
- System-level Verilog testbench available when simulating the IP embedded in IOb-SoC.
- Simulation Makefile for the open-source and free of charge Icarus Verilog simulator.
- FPGA synthesis and implementation scripts for two FPGA families from two FPGA vendors.
- Automated creation of FPGA netlists
- Automated production of documentation using the open-source and free Latex framework.
- IP data automatically extracted from FPGA tool logs to include in documents.
- Makefile tree for full automation of simulation, FPGA implementation and document production.
- AXI4 Lite CPU interface (premium option).
- Parity bits (premium option).

Benefits

- Compact and easy to integrate hardware and software implementation
- Can fit many instances in low cost FPGAs and ASICs
- Low power consumption

Deliverables

- ASIC or FPGA synthesized netlist or Verilog source code, and respective synthesis and implementation scripts
- ASIC or FPGA verification environment by simulation and emulation
- Bare-metal software driver and example user software
- User documentation for easy system integration
- Example integration in IOb-SoC (optional)

Block Diagram

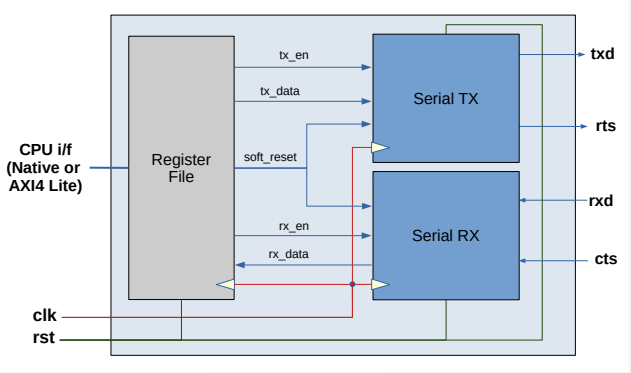

Figure 1: High-level block diagram

FPGA Resources

Resource	Used
LUTs	100
Registers	112
DSPs	0
BRAM	0

Resource	Used
ALM	88
FF	124
DSP	0
BRAM blocks	0
BRAM bits	0
PIN	63

Table 1: FPGA results for Kintex Ultrascale (left) and Cyclone V GT (right)