Intel Arria® 10 FPGA - Iperf Design for Nios® V/m Processor

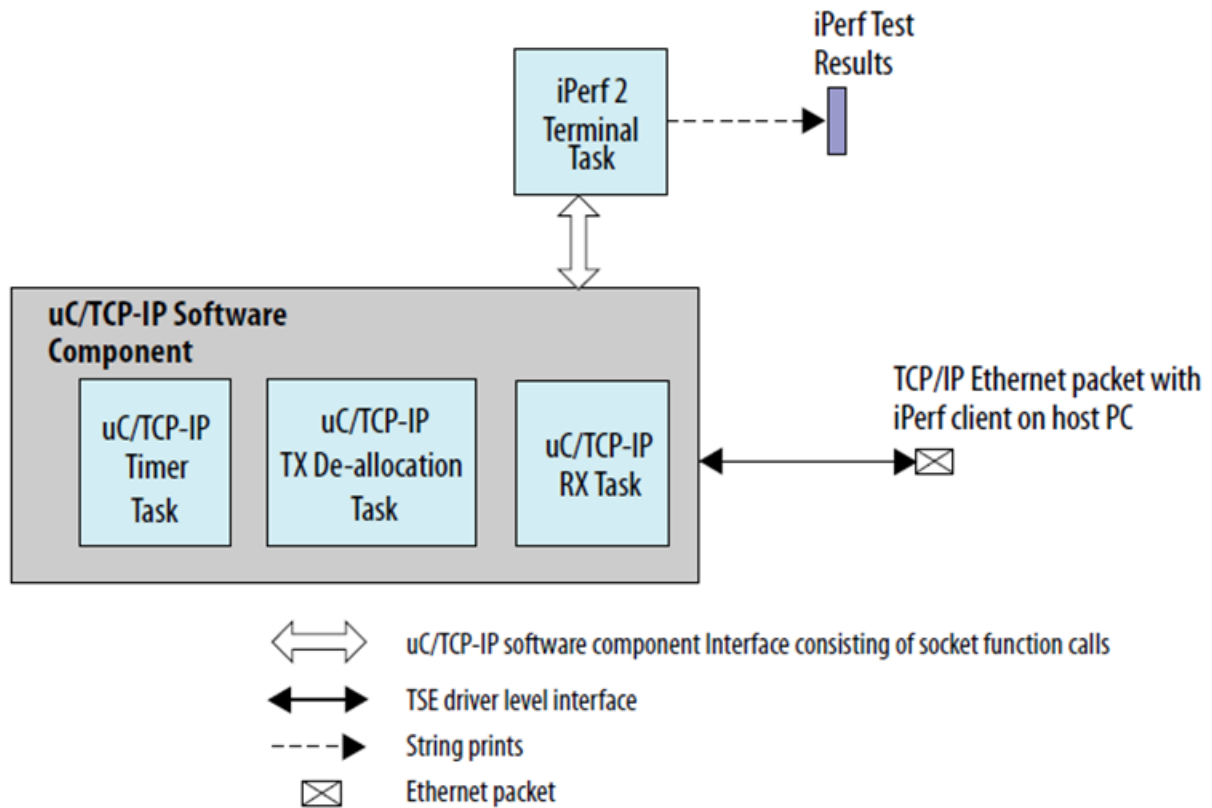Date: 06/30/2023
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Theory Of Operation

Block Diagram

Description

Perf 2 is a benchmarking tool for measuring performance between two systems, and it can be used as a server or a client.

An iPerf server receives an iPerf request sent over a TCP/IP connection from any iPerf clients and runs the iPerf test according to the provided arguments. Each test reports the bandwidth, loss, and other parameters.

IP Cores

- NIOS V/m soft processor core
- Triple-Speed Ethernet Intel FPGA IP
- altera_msgdma
- On Chip RAM
- JTAG UART

Executing the Design on dev kit

Note: Please refer to the readme.txt file in the package for the steps to create the design, application and generate the programing files.

- Unpackage/extract the design in your working directory
- Locate the "ready_to_test" folder within the package
- The folder contains the necessary files for executing the application on the board. Refer to the readme file for the steps to program the application files on the board.
- Validate the design by observing the prints on the terminal.

Expected Result

Note: The network configuration is likely to be different from that used by Intel to test. The results shown below may vary depending on the setup and configurations.

The following is the output as observed on the JTAG UART terminal. The output is analogous to the logic from the application code.

```
[main] Main Task TOS: 0x51cf8
Print the value of System ID
System ID from Peripheral core is 0xFACECAFE
[uc_main_task]
[uc_main_task] ===============================================================
[uc_main_task]                        uC/TCP-IP Setup
[uc_main_task] ===============================================================
[uc_main_task] TSE MAC base: 0x212000.
[uc_main_task] Rx csr name: /dev/sys_tse_msgdma_rx_csr.
[uc_main_task] Tx csr name: /dev/sys_tse_msgdma_tx_csr.
[uc_main_task] INFO: Initializing network stack.
[conf_static] Configuring (static) IP address
[conf_static]  * Address: 192.168.130.5
[conf_static]  * Mask:    255.255.255.0
[conf_static]  * Gateway: 192.168.130.254
[uc_main_task] INFO: Initializing network stack: Success. Using interface 1.


IPerf Terminal



>


-----------------------------------------------------------
TEST ID :   1
***********************************************************
TCP Server listening on 192.168.130.5 Port  5001
Window size:   4096 bytes
Buffer size:   8192 bytes
-----------------------------------------------------------
Local 192.168.130.5 Port  5001 connected with 192.168.130.254 Port 58914
L[ 6] R[ 5]    0.000 -    1.047 sec :    1679000 Bytes,       12829 Kbits/sec
L[ 6] R[ 5]    1.047 -    2.060 sec :    2268840 Bytes,       17917 Kbits/sec
L[ 6] R[ 5]    2.060 -    3.074 sec :    2271760 Bytes,       17923 Kbits/sec
L[ 6] R[ 5]    3.074 -    4.085 sec :    2277600 Bytes,       18021 Kbits/sec
L[ 6] R[ 5]    4.085 -    5.097 sec :    2277600 Bytes,       18003 Kbits/sec
L[ 6] R[ 5]    5.097 -    6.109 sec :    2274680 Bytes,       17981 Kbits/sec
L[ 6] R[ 5]    6.109 -    7.122 sec :    2268840 Bytes,       17917 Kbits/sec
L[ 6] R[ 5]    7.122 -    8.134 sec :    2271760 Bytes,       17958 Kbits/sec
L[ 6] R[ 5]    8.134 -    9.146 sec :    2277600 Bytes,       18003 Kbits/sec
***************** RESULT ******************
Bytes received          =    21886104
Duration (sec)          =       10.042
Socket Call       count =        7496
Transitory error  count =           0
CPU Usage Max           =        0 %
CPU Usage Average       =        0 %
Average speed           =    17435 Kbits/sec
*************************************************
```