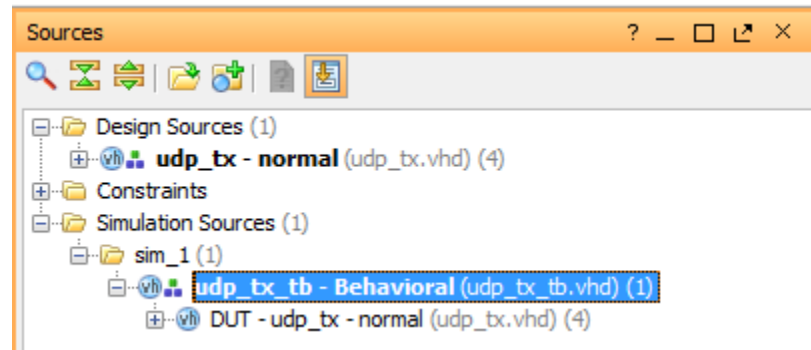


## How to run simulation for the UDP Transmitter Module

The testbench is designed to read input data from text file and write the output of the module to text file. Each input text file represents test scenario for the transmitter module. The steps to run any scenario are as follow:

1. Open udp\_tx.xpr/udp\_tx\_post\_synth.xpr project in Vivado and then open the simulation source file.



2. Scroll down in the testbench to line 59 to change the input file name to which text file you are going to use in the simulation.

```
file In_file : text open read_mode is "zero-length.txt";-- Change the file name
```

3. Scroll down to line 82 to change the number of udp packets will be tested based on the provided table.

```
signal Num_of_pkts : POSITIVE := 1;
```

Text File	Number of UDP Packets
zero-length.txt	1
odd-length1.txt	1
odd-length2.txt	1
even-length.txt	1
Max-length.txt	1
consecutive-packets.txt	3

4. Run behavioral/post-synthesis simulation for at least 500 ns.
5. Then the testbench will write the output of the module to a text file "output.txt".  

```
file Out_file : text open write_mode is "output.txt";
```
6. In order to check whether the module is behaving as expected or not, you need to compare between "output.txt" file and expected result text file (i.e. zero length test case will have expected result in "zero-length-res.txt").
7. To compare between text files, they should be in the same directory. Then, you need to execute cmp command in Linux. for Windows you can use Cygwin to execute linux commands. If they are matching nothing will be returned in the prompt.

```
/cygdrive/c/tutorials/udp_tx

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials
$ cd udp_tx

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt zero-length-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt odd-length1-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt odd-length2-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt max-length-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt even-length-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$ cmp output.txt consecutive-packets-res.txt

Mohammed A1oqayli@DESKTOP-QIUAVVN /cygdrive/c/tutorials/udp_tx
$
```

## Test Data Format:

Each input text file is arranged as follow:

- First 8 bytes represent data in hexadecimal.
- Next 2 bytes represent valid signal in hexadecimal.
- Next bit represents start signal in binary.
- Last bit represents end signal in binary.

