Inconsistent Simulation Results Due to Logic Synthesis Optimization Issue

Hello,

I encountered an inconsistency issue while using Vivado in non-project mode. My system is Linux, and the Vivado version is 2023.1.

In Vivado non-project mode, during synthesis, I made some changes to the parameters instead of using Vivado's default settings. Specifically, I used the following command:

"synth_design -top top -flatten_hierarchy none -gated_clock_conversion on -bufg 15 -directive AreaMapLargeShiftRegToBRAM -fsm_extraction sequential -resource_sharing auto -control_set_opt_threshold 33 -shreg_min_size 50 -max_bram 17 -max_uram 28 -max_bram_cascade_height 2 -max_uram_cascade_height 34 -cascade_dsp auto -incremental_mode off -assert -retiming -no_lc".

During the synthesis process, the simulation results showed inconsistency due to the synthesis parameters. To better reproduce the issue and identify the root cause, I plan to document my steps in detail.

vivado.tcl and new_vivado.tcl are script files used for synthesis and simulation with default synthesis parameters and modified synthesis parameters, respectively.

1.In a Linux terminal, I executed "vivado –mode batch –source vivado.tcl" and "vivado –mode batch –source new_vivado.tcl".

2.By directly observing the terminal output, you can see that the simulation results on lines 19 and 20 are inconsistent (highlighted in red boxes in the images), displaying "40" and "60" respectively. The terminal output is as shown in the attached image.

```
## current_wave_config
00000003e00202003ffffffffff111a0
10008000a00000f2000001f11d210000
0000c000e000027c000001fae3310020
100020036000009a000001f457d10020
2000e002600000c2000001f5d3910020
6000c003a000013e000001f237e10020
30000003200000aa000001fe01c10000
30008003200037a000001dd1ac10000
2000a0002000039a000001f55f010020
4000c0022000013800001ffb4810020
4000400120000022e000001f231410060
20000001e00001a6000001fa6e710040
2000c0026000008e000001f6ee910040
3000a002600001be000001f1dc910040
4000c003200038a000001829fc00040
2000200020000600000001f9e8010000
100020016000038000001f231510000
4000c001600003ba000001f4ff510060
50002003a000037a000001f7f9e10040
7000a00020000268000001fb4d010040
2000a003a00002d2000001fbfde10040
```

Figure 1: Synthesis with Default Parameters

current_wave_config
00000003e00202003ffffffffffff111a0
10008000a00000f2000001f11d210000
0000c000e000027c000001fae3310020
100020036000009a000001f457d10020
2000e002600000c2000001f5d3910020
6000c003a000013e000001f237e10020
30000003200000aa000001fe01c10000
300080032000037a000001dd1ac10000
2000a00020000394000001f55f010020
4000c00220000138000001ffb4810020
40004001200022e000001f231410060
20000001e00001a6000001fa6e710040
2000c0026000008e000001f6ee910040
3000a002600001be000001f1dc910040
4000c003200038a000001829fc00040
200020002000006000001f9e8010000
10002001600003d8000001f231510000
4000c001600003ba000001f4ff510060
50002003a000037a000001f7f9e10660
7000a00020000268000001fb4d010660
2000a003a00002d2000001fbfde10660
Figure 2:Modified some

Parameter Values

Thank you for the community maintainers for your replies every time. Looking forward

to your response, and greatly appreciated