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1  -- Configuration declarations for TB_ExecUnit and EN_ExecUnit.
2  -- Provides independent configs for:
3  --   - Functional verification with different adder & shifter architectures
4  --   - Timing verification using Quartus-generated netlist (architecture 'structure')
5
6  library ieee;
7  use ieee.std_logic_1164.all;
8
9  -----
10 -- 1. CONFIGURATIONS OF EN_ExecUnit (internal binding of Add & Shift)
11 -----
12
13 -- EN_ExecUnit with RCA adder + IEEE_fn shifter
14 configuration CFG_EN_RCA_IEEE of EN_ExecUnit is
15   for RTL
16     -- Adder: ripple-carry (RCA)
17     for Add : EN_Adder
18       use entity work.EN_Adder(RCA);
19     end for;
20
21     -- Shifter: IEEE function-based architecture
22     for Shift : EN_Shift
23       use entity work.EN_Shift(IEEE_fn);
24     end for;
25   end for;
26 end configuration CFG_EN_RCA_IEEE;
27
28
29 -- EN_ExecUnit with RCA adder + barrel shifter
30 configuration CFG_EN_RCA_Barrel of EN_ExecUnit is
31   for RTL
32     for Add : EN_Adder
33       use entity work.EN_Adder(RCA);
34     end for;
35
36     for Shift : EN_Shift
37       use entity work.EN_Shift(barrel);
38     end for;
39   end for;
40 end configuration CFG_EN_RCA_Barrel;
41
42
43 -- EN_ExecUnit with CBA adder + IEEE_fn shifter
44 configuration CFG_EN_CBA_IEEE of EN_ExecUnit is
45   for RTL
46     for Add : EN_Adder
47       use entity work.EN_Adder(CBA);
48     end for;
49
50     for Shift : EN_Shift
51       use entity work.EN_Shift(IEEE_fn);
52     end for;
53   end for;
54 end configuration CFG_EN_CBA_IEEE;
55
56
57 -- EN_ExecUnit with CBA adder + barrel shifter
58 configuration CFG_EN_CBA_Barrel of EN_ExecUnit is
59   for RTL
60     for Add : EN_Adder
61       use entity work.EN_Adder(CBA);
62     end for;
63
64     for Shift : EN_Shift
65       use entity work.EN_Shift(barrel);
66     end for;
67   end for;
68 end configuration CFG_EN_CBA_Barrel;
69
70 -----
71 -- 2. CONFIGURATIONS OF TB_ExecUnit (select which EN_ExecUnit config)
72 -----
73

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74 -- Functional config: RCA adder + IEEE_fn shifter
75 configuration CFG_FUNC_RCA_IEEE of TB_ExecUnit is
76   for behavior
77     for DUT : TestUnit
78       -- Bind DUT to EN_ExecUnit using the RCA+IEEE configuration
79       use configuration work.CFG_EN_RCA_IEEE;
80     end for;
81   end for;
82 end configuration CFG_FUNC_RCA_IEEE;
83
84
85 -- Functional config: RCA adder + barrel shifter
86 configuration CFG_FUNC_RCA_Barrel of TB_ExecUnit is
87   for behavior
88     for DUT : TestUnit
89       use configuration work.CFG_EN_RCA_Barrel;
90     end for;
91   end for;
92 end configuration CFG_FUNC_RCA_Barrel;
93
94
95 -- Functional config: CBA adder + IEEE_fn shifter
96 configuration CFG_FUNC_CBA_IEEE of TB_ExecUnit is
97   for behavior
98     for DUT : TestUnit
99       use configuration work.CFG_EN_CBA_IEEE;
100    end for;
101  end for;
102 end configuration CFG_FUNC_CBA_IEEE;
103
104
105 -- Functional config: CBA adder + barrel shifter
106 configuration CFG_FUNC_CBA_Barrel of TB_ExecUnit is
107   for behavior
108     for DUT : TestUnit
109       use configuration work.CFG_EN_CBA_Barrel;
110     end for;
111   end for;
112 end configuration CFG_FUNC_CBA_Barrel;
113

```