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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

```