

# Report Statements

In VHDL, the **report statement** is used to generate text messages during simulation. This statement is useful for providing information about the status or certain values during simulation. The generated report will appear in the transcript to help with debugging.

## 'Image Attribute

In VHDL, the `'image` attribute is used to convert a certain data type into a string data type. This attribute is useful when you want to combine or display values of different data types in the form of a string. In a report statement, this attribute is used so that variables/signals can be printed to the transcript, which only accepts strings.

Here is an example of a report statement that also uses the `'image` attribute:

```
LIBRARY IEEE;
USE IEEE.STD_LOGIC_1164.ALL;
USE IEEE.STD_LOGIC_ARITH.ALL;

ENTITY test IS
PORT (
    clk : IN STD_LOGIC
);
END test;

ARCHITECTURE Behavioral OF test IS
    SIGNAL counter : UNSIGNED(7 DOWNTO 0);
BEGIN
    PROCESS
    BEGIN
        WAIT FOR 50 ps;
        LOOP
            WAIT UNTIL rising_edge(clk);
            REPORT "Counter = " & INTEGER'image(conv_integer(counter));
            counter <= counter + 1;
        END LOOP;
    END PROCESS;
END Behavioral;
```

Example simulation:

The screenshot displays a simulation tool interface. On the left, a waveform viewer shows two signals: `/test/clk` and `/test/counter`. The `/test/clk` signal is a square wave with a period of 100 ps. The `/test/counter` signal is a counter that increments by 1 on each rising edge of the clock. The waveform viewer shows the counter value starting at 0 and increasing to 5 over 600 ps.

On the right, a transcript window shows the simulation commands and output:

```
Library x Project x sim x
Transcript
# Loading ieee.std_logic_arith(body)
# Loading work.test(behavioral)
add wave -position insertpoint sim:/test/*
force -freeze sim:/test/clk 1 0, 0 {50 ps} -r 100
VSIM 9> run
# ** Note: Counter = 0
# Time: 100 ps Iteration: 0 Instance: /test
# ** Note: Counter = 1
# Time: 200 ps Iteration: 0 Instance: /test
run
# ** Note: Counter = 2
# Time: 300 ps Iteration: 0 Instance: /test
# ** Note: Counter = 3
# Time: 400 ps Iteration: 0 Instance: /test
run
# ** Note: Counter = 4
# Time: 500 ps Iteration: 0 Instance: /test
# ** Note: Counter = 5
# Time: 600 ps Iteration: 0 Instance: /test
```

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