95-1 Under-Graduate Project
Simulation & Debugging Tools

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Verilog Simulator

Circuit Description

module add4 (sum, carry, A, B, cin);
output [3:0] sum;
......
endmodule

Testfixture

module testfixture;
reg [3:0] A, B;
......
endmodule

Verilog Simulator

Verilog Parser

Simulation Engine

User Interface

Graphical Simulation Result

Text Mode Simulation Result

<table>
<thead>
<tr>
<th>Time (ns)</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0</td>
<td>x</td>
</tr>
<tr>
<td>16.00</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>100.00</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>......</td>
<td>......</td>
<td>......</td>
</tr>
</tbody>
</table>
Verilog-XL (1/2)

Check Syntax Error!

1 Syntax Error!
Verilog-XL (2/2)

No Syntax Error!

Compile with Testbench!
Debussy

From NOVAS
Debussy - nSchema

From NOVAS

pp. 6
nSchema – Detailed RTL

Same schematic as 4.4

Detail RTL
Debussy - nTrace

From NOVAS
nTrace

Note: The waveform displayed here is just for your reference. The annotated signals are not necessarily displayed.
nTrace

You can easily find your signal's path from the transition.

Click on the icon

The icon can help you to override the delay and find the real signal path
Debussy - nState

From NOVAS
nState

- Finite State Machine → State Animation
Display Property on nState

- View -> State Action
- View -> Transition Condition
- View -> Transition Action
Debussy - nWave

From NOVAS
nWave

# Cell library is at /home/raid1_1/cic:
- 0.18um: /home/raid1_1/cic/CBDx018_UMC_Artisan
- /home/raid1_1/cic/CBDx018_TSMC_Artisan
- 0.25um: /home/raid1_1/cic/CIC_CBDx25_V1
- 0.35um: /home/raid1_1/cic/CIC_CBDx35_V3

# For detailed CAD tools and workstations lists,
please refer to http://cad.ee.ntu.edu.tw

# PLEASE BACKUP YOUR DATA ON YOUR OWN.

# Please check the update workstation list at http://cad.ee.ntu.edu.tw

# cad16~cad27, cad29~cad33 are now ON.

*************************************************************
11:10am up 107 day(s), 20:51, 3 users, load average: 2.09, 2.04, 2.03
Displaying on cad33 ...
platform= SOLARIS2
License of Synopsys physical tools is already set!
License of Synopsys physical tools is already set!
MENTOR license is already set.
cad33:/home/raid1_3/user94/r941111% nWave &
nWave – Read File

Read the Wave file (form test-bench file)
nWave – Choosing Signals

Choose the signals you want to know
nWave – Signal Format Set up

Change to Decimal
nWave - Result

Show the product of the inputs
Conclusion - Waveform Operations

- Bus Operations
- Search Value
- Label Marker
- Logical Operations
- Complex Event Search
- Conditional Comparison of Waveform