ModelSim 6.0

Web: www.model.com

Quick Guide

vlog

Key Arguments (use –help for full list)

[-vlog95compat]	Disable Verilog 2001 keywords
[-compat]	Disable event order optimizations
[-f <filename>]	Pass in arguments from file
[-05]	Maximum optimization
[-hazards]	Enable run-time hazard checking
[-help]	Display ***vlog*** syntax help
[-nodebug]	Hide internal variables & structure
[-quiet]	Disable loading messages
[-R <simargs>]	Invoke VSIM after compile
[-refresh]	Regenerate lib to current version
[-sv]	Enables SystemVerilog keywords
[-version]	Returns vlog version
[-v <library_file>]	Specify Verilog source library
[-work <libname>]	Specify work library
<filename(s)>	Verilog file(s) to be compiled

Examples

vlog top.v
vlog –work mylib –refresh

vcom

Key Arguments (use –help for full list)

[-2002] [-93] [-87]	Choose VHDL 2002,1993, or 1987
[-check_synthesis]	Turn on synthesis checker
[-debugVA]	Print VITAL opt status
[-05]	Maximum optimization
[-explicit]	Resolve ambiguous overloads
[-help]	Display ***vcom*** syntax help
[-f <filename>]	Pass in arguments from file
[-norangecheck]	Disable run time range checks
[-nodebug]	Strip internal names
[-novitalcheck]	Disable VITAL95 checking
[-nowarn <#>]	Disable individual warning msg
[-O0]	Disable optimization
[-quiet]	Disable loading messages
[-refresh]	Regenerate library image
[-version]	Returns vcom version
[-work <libname>]	Specify ***work*** library
<filename(s)>	VHDL file(s) to be compiled

Examples

vcom MyDesign.vhd
vcom -93 -work /lib/mylib util.vhd
vcom -refresh

sccom

Key Arguments (use –help for full list)

-link	Links source code, required
[CPP option]	C++ compiler option
[-g]	Compile with debugging info
[-nonamebind]	Disables automatic name binding
[-scv]	Includes SystemC verification library
<filename(s)>	SystemC files to be compiled

Examples

sccom -g example.cpp
sccom -link example
sccom -I/home/systemc/include -g a.cpp b.cpp

Code Coverage

Key Arguments to vcom/vlog

-cover bcesx	Specifies coverage type(s)

Key Arguments to vsim

-coverage	Enables statistics collection

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Wave Window

add wave <item>	Wave specific signals/nets
add wave *	Wave signals/nets in scope
add wave -r /*	Wave all signals/nets in design
add wave abus(31:15)	Wave a slice of a bus
view wave	Display wave window
view wave -new	Display additional wave window
write wave	Print wave window to file
<left mouse button>	Select signal / Place cursor
<middle mouse button>	Zoom options
<right mouse button>	Context Menu
<ctrl-f>	Find next item
<tab> (go right)	Search forward for next edge
<shift-tab> (go left)	Search backward for next edge
i or + | o or -	Zoom in | Zoom out
f | |	Zoom full | Zoom Last

Tcl/Tk

Environment Variable

MODELSIM_TCL

Online Documentation

Help->Tcl Help
Help->Tcl Syntax
Help->Tcl Man Pages
Help->Technotes->MTI_Widgets

Language Syntax

command arg1 arg2 arg3 ...

Language Syntax: Command

set <var> <value>
expr <math expression>
exec <ShellCommand>
info <option> <procedure name>
winfo <option> <window name>

Language Syntax: Procedures

```
proc name {arglist} {body}
        proc diag {a b} {
        set c [expr sqrt($a*$a + $b
        return $c
        }
```

Language Syntax: Conditionals

```
if {boolean} {bodytrue} else {bodyfalse}
        if {$now < 10000} {echo $now}
```

Language Syntax: Loops

while *{boolean} {body}*
foreach loopVar {valuelist} {cmdBody}
for {initial} {test} {final} {body}

Poking around in ModelSim Tcl/Tk

info	Get info on a Tcl construct
info xx	Find out the args to ***info***
winfo	Get info on Tk widgets
winfo xx	Find out args to ***winfo***
winfo children .	Return the sub-widgets to ModelSim

Light blue highlight denotes SE-only features.

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Installation / Environment / Licensing

Documentation

Installation instructions:

www.model.com/support/installation/default.asp

FlexLM:

www.macrovision.com

Web — Download the Latest Release

www.model.com/downloads/default.asp

Environment Variables (see ModelSim cmd "printenv")

LM_LICENSE_FILE	***Required***	Pathname of *license.dat* file or port@host
DOPATH	Optional	Search path for ".do" files
EDITOR	Optional	Specifies editor for "edit" cmd
MODELSIM	Optional	Pathname of *modelsim.ini* file
MODELSIM_TCL	Optional	List of *modelsim.tcl* files
MODEL_TECH_TCL	Optional	Pathname to Tcl/Tk libraries
MODEL_TECH	***Don't Set***	Used internally by ModelSim
MGC_LOCATION_MAP	Optional	Used as "soft" path to find files
PLIOBJS	Optional	Used to load PLI object files
TMPDIR	Optional	Used by VSIM for temp space

PATH Environment Variable

Unix: Add */<install_dir>/modeltech/<platform>* to $path
or */<install_dir>/modeltech/bin* to $path
PC: PATH will be updated automatically during installation

Starting the License Server

Unix: Copy *license.dat* file to */<install_dir>/modeltech/<platform>/*
Run */<install_dir>/modeltech/<platform>/START_SERVER*
PC: Run */<install_dir>/modeltech/win32/*lmtools.exe
Use "Config Services" and "Start" tabs to configure and start server

Licensing Diagnostics

Unix: Run */<install_dir>/modeltech/<platform>/lmstat -a*
or lmdiag
PC: Run */<install_dir>/modeltech/win32/lmutil lmstat -a*
or lmutil lmdiag -or-
PC: *Start->Programs->ModelSim->Licensing Wizard*

ModelSim Products

www.model.com/products/default.asp

Quick Guide Notes

Find this document at
www.model.com/support/documentation/SE/pdf/qk_guide.pdf)
Commands in bold are typed at the
ModelSim> or VSIM> prompts

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Key ModelSim Commands

Commands may be used in the following locations: (Sh)ell, (M)odelSim> prompt, or (V)SIM> prompt. See Command Reference for complete command list and syntax.

vcom	Sh, M, V	VHDL Compiler (see below)
vdel	Sh, M, V	Deletes a design unit from a specific library
vdir	Sh, M, V	Lists the contents of a library
vlib	Sh, M, V	Creates a design library
vlog	Sh, M, V	Verilog Compiler (see below)
sccom	Sh, M, V	SystemC Compiler (see below)
vmap	Sh, M, V	Defines or displays library mappings
vopt	Sh, M, V	Optimize design (see ***Performance*** below)
vsim	Sh, M, V	Load design (see below)
add list / wave	V	Add signals to the List or Wave windows
add log	V	Log signals to *vsim.wlf* file for analysis later
alias	M, V	Create a user defined alias (e.g., ***alias h "history"***)
bp, bd	V	Set/Clear a breakpoint (see ***Managing Breakpoints*** below)
cd	Sh, M, V	Change directory
change	V	Modify a VHDL variable or Verilog register
checkpoint	V	Save the state of you simulation (see ***restore***)
compare add	M, V	Compare signals
configure	M, V	Configure List or Wave window attributes
delete	V	Remove HDL item from List or Wave window
do	M, V	Execute a file of commands (e.g., ***do macro.do***)
drivers	V	Display current and future value of signal or net drivers
dumplog64	Sh	Dump the contents of the *vsim.wlf* file in a readable form
echo	M, V	Display message (e.g., ***echo "Time is $now ns."***)
edit	M, V	Invoke editor specified by the EDITOR env variable
environment	M, V	Display or change current region/signal environment
examine	M, V	Examine one or more HDL items (e.g., ***exa /top/clk***)
find	V	Display pathnames of matching HDL items
force	V	Force signals or nets (e.g., ***force clk 1 10, 0 20 -r 100***)
history	M, V	List previous commands
noforce	V	Release signals or nets from force commands
notepad	M, V	Simple text editor
printenv	M, V	Display names and values of environment variables
profile on	M, V	Turn on Performance Analyzer
property	V	Change List or Wave signal attributes (color, radix, etc.)
pwd	M, V	Display current path in Main transcript window
radix	M, V	Change the default radix in all windows
report	M, V	returns all control or state variable values
restart	V	Restart the simulator
restore	M, V	Restore the simulation state from a previous ***checkpoint***
resume	M, V	Resume macro execution after a pause command
right / left	V	Search in wave window for next transition or -expr
run	V	Advance simulation time (e.g., ***run 1000***)
search / next	V	Search specified window for next item matching pattern
seetime	V	Scroll List or Wave window to time (e.g., ***seetime wave 500***)
vcd2wlf	Sh	Translate VCD file into WLF file
vcddumpports	M, V	Create a VCD file
vcover merge	Sh, M, V	Merges coverage reports
vgencomp	Sh	Create VHDL component from compiled Verilog module
view	M, V	Open a ModelSim window and pop it to the top
vmake	Sh	Print a makefile for a library
vsource	V	Display HDL source file in Source window
when	M, V	Perform action on condition (e.g., ***when clk=1 {echo clk}***)
where	M, V	Display info about the environment
write	M, V	Records names, window contents, and preferences to a file
!! | !n	M, V	Repeat last command, Repeat nth command
!abc	M, V	Repeat cmd starting "abc"
^abc^xyz	M, V	Replace "abc" in previous command with "xyz"

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vsim

Key Arguments (use –help for full list)

[-c]	Run in cmd line mode
[-coverage]	Invoke Code Coverage
[-do "cmd" | <file>]	Run cmd or file at startup
[-elab]	Create elaboration file
[-f <filename>]	Pass in args from file
[-gIG<name=value>]	Set VHDL Generic values
[-hazards]	Enable hazard checking
[-help]	Display vsim syntax help
[-l <logfile>]	Save transcript to log file
[-load_elab]	Simulate an elaboration file
[+notimingchecks]	Disable timing checks
[-quiet]	Disable loading messages
[-restore <filename>]	Restore a simulation
[-sdf{min|typ|max} <region>=<sdffile>]	Apply SDF timing data e.g., sdfmin /top=MySDF.txt
[-sdfnowarn]	Disable SDF warnings
[-t [<mult>]<unit>]	Time resolution
[-version]	Returns vsim version
[-view <filename>]	Log file for VSIM to view
[-wlf <filename>]	Log file to create
[<libname>.<design_unit>	Configuration, Module, Entity/Arch, or optimized design to simulate

Examples

```
vsim top
vsim -lib mywork top -do commands.do
```

Files

modelsim.ini	Simulator Initialization file; stores library locations, simulator resolution, paths, etc.
startup.do	Default name of macro executed after design is loaded; See "startup=" line in modelsim.ini
transcript	Default filename that ModelSim transcript window activity is saved to
vsim.wlf	Default name of simulation log file saved by VSIM

modelsim.ini

Copy modelsim.ini to current directory
Execute vmap -c
Loading order (stops after finding first file)

1. $MODELSIM environment variable
2. Current directory if $MODELSIM is not set
3. In */<install_dir>/modeltech/<platform>* directory
4. In */<install_dir>/modeltech* directory

For Detailed Information see:
ModelSim User's Manual "ModelSim Variables"

modelsim.tcl

Loading order
Always loads: */<install_dir>/modeltech/tcl/vsim/pref.tcl*
Loads the first found from:

1. $MODELSIM_TCL if it exists (":" separated list) (all files in list are loaded)
2. Current directory *./modelsim.tcl*
3. *$HOME/modelsim.tcl*

Managing Breakpoints

bp	Sets a breakpoint; without arg shows all bps
bd	Deletes a breakpoint
disablebp	Turn off all breakpoints
enablebp	Turns all breakpoints on
onbreak	Define what to do when a breakpoint is hit during a macro (e.g., onbreak {resume})
when	Perform actions under certain conditions

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Performance

Key arguments to vopt

-o <name>	Optimized design name
<design>	Top-level design unit
[+acc=[<spec>]+[<module>]]	Enable design object visibility

Key arguments to vsim

[-elab]	Create elaboration file
[-load_elab]	Simulate elaboration file

Signal Spy

init_signal_driver	Drive hierarchical signal
init_signal_spy	Read hierarchical signal
signal_force	Force hierarchical signal
signal_release	Release hierarchical signal

PSL

Key arguments to vcom and vlog

[-pslfile <file>	External PSL file

Key Commands

assertion fail	Assertion failure response
assertion pass	Assertion pass response
assertion report	Assertion status report
fcover clear	Clear coverage meta-data
fcover	Adds meta-data to coverage database
fcover configure	Functional coverage target configuration
fcover report	Functional coverage results report
fcover save	Save data to reloadable file
fcover vcover merge	Merge coverage data files offline

More Info . . .

*PDFs for *SE/PE/LE (see docs/pdf sub-directory)*

Installation Guide	**_install.pdf*
User's Manual	**_man.pdf*
Command Reference	**_cmds.pdf*
GUI Reference	**_gui.pdf*
ModelSim Tutorial	**_tutor.pdf*
FLI Reference	*fli.pdf*

Training
www.model.com/training/default.asp
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www.model.com/products/informant.asp

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