Quick Guide

ModelSim 6.5

Key Commands

add memory
opens the specified memory in the MDI frame of the Main window
add testbrowser
adds .ucdb files to the Test Management Browser
add watch
adds signals or variables to the Watch window
add wave
adds VHDL signals and variables, and Verilog nets and registers to the Wave window
alias
creates a new Tcl procedure that evaluates the specified commands
change
modifies the value of a VHDL variable or Verilog register variable
checkpoint
saves the state of your simulation
compare add
compares signals in a reference design against signals in a test design
configure
invokes the List or Wave widget configure command for the current default List or Wave window

COVERAGE ------

coverage attribute
displays attributes in the currently loaded database
coverage clear
clears all coverage data obtained during previous run commands
coverage diff
reports the coverage differences between two test runs
coverage file
sets the name of the coverage data file to be automatically saved at the end of simulation
coverage goal
Sets the value of UCDB-wide goals
coverage ranktest
ranks coverage data according to user-specified tests
coverage report
produces a textual output of the coverage statistics that have been gathered up to this point
coverage summaryinfo
prints coverage numbers of the specified coverage types without loading the entire database
coverage tag
adds or removes tags from specified objects
coverage testnames
displays test names in the current UCDB file loaded

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delete
removes objects from either the List or Wave window

do
executes commands contained in a macro file
drivers
displays in the Main window the current value and scheduled future values for all the drivers of a specified VHDL signal or Verilog net
dumplog64
dumps the contents of the *vsim.wlf* file in a readable format
echo
displays a specified message in the Main window
edit
invokes the editor specified by the EDITOR environment variable
environment
displays or changes the current dataset and region environment
examine
examines one or more objects, and displays current values (or the values at a specified previous time) in the Main window
find
displays the full pathnames of all objects in the design whose names match the name specification you provide
force

applies stimulus to VHDL signals and Verilog nets
history
lists the commands executed during the current session
next
continues a search; see the search command
noforce
removes the effect of any active force commands on the selected object
notepad
opens a simple text editor
printenv
echoes to the Main window the current names and values of all environment variables
profile on
enables runtime profiling of where your simulation is spending its time and where memory is allocated
property list
changes one or more properties of the specified signal, net, or register in the List Window
property wave
changes one or more properties of the specified signal, net, or register in the Wave Window
pwd
displays the current directory path in the Main window
qverilog
compiles, optimizes, and simulates a Verilog or SystemVerilog design in one step
radix
specifies the default radix to be used
report
displays the value of all simulator control variables, or the value of any simulator state variables relevant to the current simulation
restart
reloads the design elements and resets the simulation time to zero
restore
restores the state of a simulation that was saved with a checkpoint command during the current invocation of vsim
resume
resumes execution of a macro file after a pause command or a breakpoint
right
searches right (next) for signal transitions or values in the specified Wave window
run
advances the simulation by the specified number of timesteps
sccom
compiles SystemC design units
sdfcom
compiles SDF files
search
searches the specified window for one or more objects matching the specified pattern(s)
seetime
scrolls the List or Wave window to make the specified time visible
ucdb2html
converts a .ucdb file into HTML
vcd dumpports
creates a VCD file that captures port driver data
vcd2wlf
translates VCD files into WLF files
vcom
compiles VHDL design units
vcover attribute
displays attributes in the currently loaded database
vcover merge
merges multiple code coverage data files offline
vcover ranktest
ranks the specified input files according to their contribution to cumulative coverage
vcover report
reports on multiple code coverage data files offline
vcover stats
produces summary statistics from multiple coverage data files
vcover testnames
displays test names in the current UCDB file loaded
vdel

deletes a design unit from a specified library
vdir
lists the contents of a design library
verror
prints a detailed description of a message number
vgencomp
writes a Verilog module's equivalent VHDL component declaration to standard output
view
opens a QuestaSim window and brings it to the front of the display
vlib
creates a design library
vlog
compiles Verilog design units and SystemVerilog extensions
vmake
creates a makefile that can be used to reconstruct the specified library
vmap
defines a mapping between a logical library name and a directory
vopt
produces an optimized version of your design
vsim
loads a new design into the simulator
when
instructs QuestaSim to perform actions when the specified conditions are met
where
displays information about the system environment
wlf2log
translates a QuestaSim WLF file to a QuickSim II logfile
wlf2vcd
translates a QuestaSim WLF file to a VCD file
wlfman
outputs information about or a new WLF file from an existing WLF file
xml2ucdb
creates an HTML report of code coverage from a .ucdb file

RED text = ModelSim SE only.

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TRAINING

Key Command Arguments

Use <command> -help for a full list.

QVERILOG

The qverilog command compiles, optimizes, and simulates Verilog and SystemVerilog designs in a single step.
1. automatic work library creation
2. support for all standard vlog arguments
3. support for C/C++ files via the SystemVerilog DPI
4. implicit “run -all; quit” unless using -i, -gui, -do (see -R below)
5. vopt performance invoked (see the vopt section of this guide)

Key arguments to qverilog

<filename>	Verilog source code file to compile, one is required
[-R <sim_options>]	vsim command options applied to simulation

SCCOM

-link	Links source code, required
[CPP option]	C++ compiler option
[-g]	Compile with debugging info
-vv	Echo subprocess invocations on stdout
[-scv]	Includes SystemC verification library
<filename(s)>	SystemC files to be compiled

VCOM

[-2008 | -2002 | -93 |-87]	Choose VHDL 2008, 2002,1993, or 1987
[-check_synthesis]	Turn on synthesis checker
[-debugVA]	Print VITAL opt status
[-explicit]	Resolve ambiguous overloads
[-help]	Display vcom syntax help
[-f <filename>]	Pass in arguments from file
[-norangecheck]	Disable run time range checks
[-nodebug]	Hide internal variables & structure
[-novitalcheck]	Disable VITAL95 checking
[-nowarn <#>]	Disable individual warning msg
[-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

VLOG

[-vlog95compat]	Disable Verilog 2001 keywords
[-compat]	Disable event order optimizations
[-f <filename>]	Pass in arguments from file
[-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

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PRODUCTS

VOPT

Design optimization options
1. Optimized designs simulate faster, while non-optimized designs provide object visibility for debugging.
2. Use +acc with vopt or vsim -voptargs with +acc for selective design object visibility during debugging.
3. Read “Optimizing Designs with vopt” in the User’s Manual for additional information.

Key arguments to vopt

-o <name>	Optimized design name
<design>	Top-level design unit
[+acc=[<spec>]+[<module>]]	Enable design object visibility
+cover=bcefsx	Specifies coverage type(s)
-nocover	Disable coverage on all source files
-g	Assigns a value to generics and parameters with no value
-G	Forces value assignment for generics and parameters

Key arguments to vsim

[-vopt]	Run vopt if not automatically invoked
[-voptargs=”<args>”]	Arguments passed to vopt, use +acc args for design visibility

VSIM

[-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
[-g|G<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
[-vcdstim [<instance>=]<filename>]	Stimulate the top-level design or instances from an Extended VCD file
[-version]	Returns vsim version
[-vopt]	Run vopt automatically
[-voptargs=”<args>”]	Arguments to pass to vopt
[-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
[-wlfcachesize]	Specify WLF reader cache size (per WLF file.)
[-wlfslim <size>]	Specify the number of Megabytes to be saved in event log file
[-wlftlim <duration>]	Specify the duration of time to be saved in event log file

Code Coverage

Key Arguments to vcom/vlog

+cover=bcefsx	Specifies coverage type(s)

Key Arguments to vopt

+cover=bcefsx	Specifies coverage type(s)
-nocover	Disable coverage on all source files

ModelSim 6.5

Quick Guide

Key Arguments to vsim

-coverage	Enables statistics collection

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 | l	Zoom full | Zoom Last

Key modelsim.ini variables

WLF*	Waveform management variables
WLFCacheSize	Change default or disable WLF file cache

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