

Innovus timeDesign vs report_timing

setDelayCalMode

Sets global parameters for delay calculation. Use this command to specify any required delay calculation mode settings before running any commands that perform delay calculation, such as timing analysis and optimization. The parameters specified with the `setDelayCalMode` command are then used automatically whenever delay calculation takes place.

Use the `getDelayCalMode` command to return the current settings for the `setDelayCalMode` command.

timeDesign

Graph based analysis (GBA)

`-outDir out_dir`

Specifies the name of the output directory that contains all the generated reports.

Default: `timingReports`

`-pathReports`

Generate `path reports only`.

Default: Generates `DRV` and `path` reports.

`-drvReports`

Generate `design rule violation (DRV) reports only`.

Default: Generates `DRV` and `path reports`.

`-timingDebugReport`

Generates a `compressed (.gz) detailed timing report in ASCII format`. This report is used for debugging timing results using the timing debug feature in Innovus.

report_timing

`-early | -late`

Generates the timing report for early paths (hold checks) or late paths (setup checks).

Default: `-late`

`-machine_readable`

Generates detailed timing report in machine-readable format. This report is used for debugging timing results using the timing debug feature.

`-max_slack float`

Reports only those paths with slack less than the value of the float.

`-net`

Adds a row for the net arc. This parameter also separates the cell delay from the wire delay.

`-max_paths integer`

Reports the specified number of worst paths in the design, with maximum of `nworst` (`-nworst`) paths to any single endpoint (**default 1**).

`-nworst integer`

Specifies the maximum number of paths which can be reported for a particular endpoint (the total number of paths reported is specified by the `-max_paths` parameter).

`-retime_mode {path | exhaustive}`

Enables exhaustive path-based analysis mode. In this mode, the software will exhaustively examine **nworst** paths of the selected endpoints and then select the true worst path to be reported - based on retimed slacks of all the examined paths.

When you use this option, reporting can be runtime intensive as the software needs to do an exhaustive search for true worst paths. Therefore, it is recommended to use this option in the later phases of sign-off stage when there are very few violations left for analysis.

`-retime {aocv | |path_slew_propagation | aocv_path_slew_propagation}`

Reanalyzes the specified set of paths using the specified method.

Note: This feature is not meant to be run on all the paths of a design.

aocv : Re-timing the timing critical paths using the LOCV derating factors

path_slew_propagation : Re-timing the timing critical paths using the actual slews for the path

aocv_path_slew_propagation : Combination of re-timing with aocv + path_slew_propagation

waveform_propagation : Re-timing with waveform effect taken into consideration during delayCal

`{> | >>} filename`

When specified with `>`, writes the report to the specified file name. If the file already exists, the software overwrites it.

When specified with `>>`, writes the report to the specified file name. If the file already exists, the software concatenates the report to the end of the file.

The filename parameter must be the last argument in the list. The filename and `-tcl_list` parameters are mutually exclusive; you cannot specify them together.

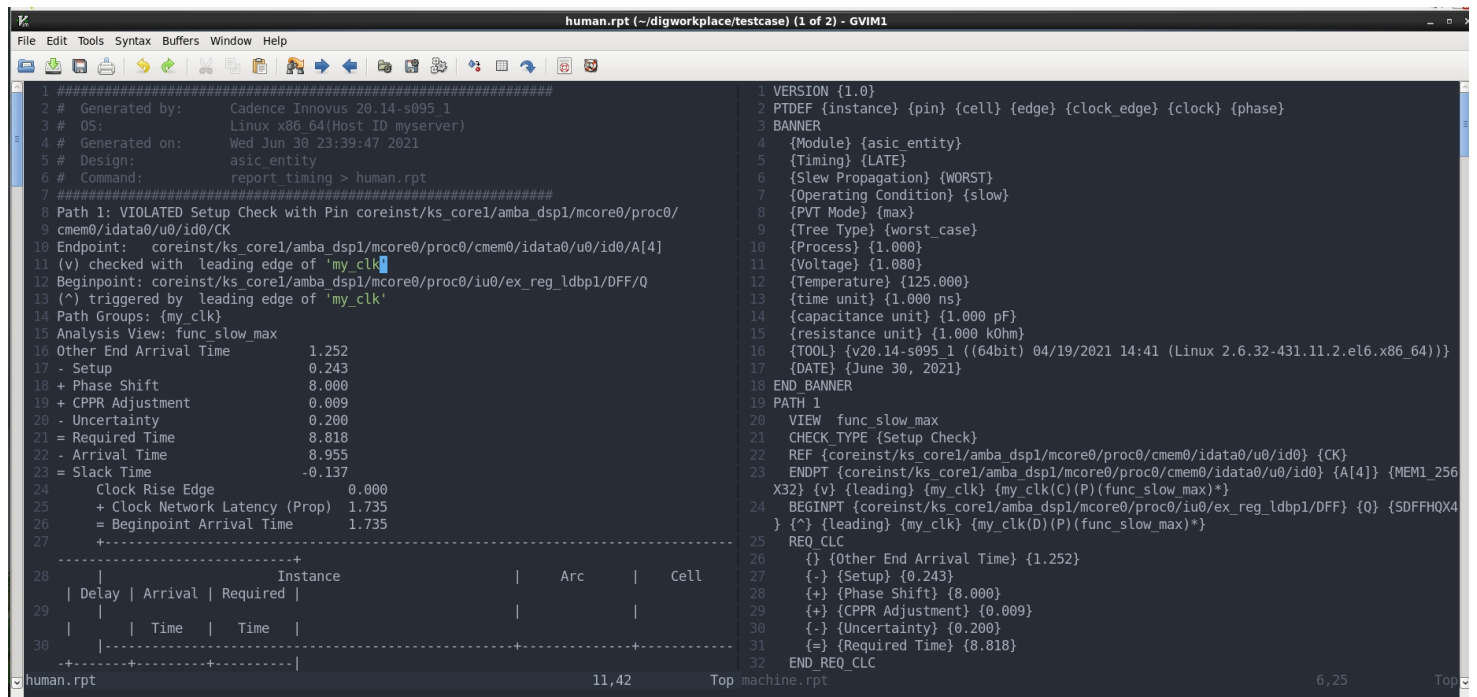
Note: To write a compressed report, add the `.gz` extension to the file name.

Default: Report is displayed on standard output without being saved.

Note: The last argument specified in the `report_timing` command is not considered a filename.

e.g. `report_timing -late -max_slack 0 -max_paths 1000 -machine_readable -view ${view} >`

`${viewsta}/design_before_late.mtarpt.gz`



```
1 #####
2 # Generated by: Cadence Innovus 20.14-s095.1
3 # OS: Linux x86_64 (Host ID myserver)
4 # Generated on: Wed Jun 30 23:39:47 2021
5 # Design: asic_entity
6 # Command: report_timing > human.rpt
7 #####
8 Path 1: VIOLATED Setup Check with Pin coreinst/ks_core1/amba_dsp1/mcore0/proc0/
9 cmem0/idata0/u0/id0/CK
10 Endpoint: coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/idata0/u0/id0/A[4]
11 (v) checked with leading edge of 'my_clk'
12 Beginpoint: coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_reg_ldbpl/DFF/Q
13 (^) triggered by leading edge of 'my_clk'
14 Path Groups: {my_clk}
15 Analysis View: func_slow_max
16 Other End Arrival Time 1.252
17 - Setup 0.243
18 + Phase Shift 8.000
19 + CPPR Adjustment 0.009
20 - Uncertainty 0.200
21 = Required Time 8.818
22 - Arrival Time 8.955
23 = Slack Time -0.137
24 Clock Rise Edge 0.000
25 + Clock Network Latency (Prop) 1.735
26 = Beginpoint Arrival Time 1.735
27 +-----+
28 | Instance | Arc | Cell |
29 | Delay | Arrival | Required |
30 | Time | Time |
31 +-----+
32 #####
33 11,42 Top machine.rpt 6,25 Top
```

report_timing_format

Specifies a `report_timing` format. See `report_timing -format` for more information.

Valid format columns are:
adjustment, abs_delay_err, abs_slew_err, annotation, aocv_adj_stages, aocv_derate, aocv_weight, arc, arrival, arrival_mean, arrival_sigma, cell, delay, delay_mean, delay_sigma, direction, edge, fanin, fanout, flags, hpin, incr_delay, instance, instance_location, latch_window, load, module, net, pct_delay_err, pct_slew_err, phase, phys_info, pin, pin_load, pin_location, power_domain, required, retime_delay, retime_delay_mean, retime_delay_sigma, retime_slew, retime_slew_mean, retime_slew_sigma, stage_count, slew, slew_mean, slew_sigma, socv_derate, spice_arrival, spice_delay, spice_slew, stolen, timing_point, total_derate, user_derate, when_cond, wire_load, wlmodel

Depending on the options specified, this global variable also enables the display of slew mean and retime slew mean details in the timing report.

For example, the following command tells report_timing to only list the instance, arc, delay, slew, arrival times in the report:

```
set_global report_timing_format {instance arc delay slew arrival}
```

To set this global variable, use the set_global command.

innovus #> timeDesign -postRoute

timeDesign Summary				
Setup views included:				
func_slow_max				
Setup mode	all	reg2reg	default	
WNS (ns):	-0.137	-0.137	0.307	
TNS (ns):	-1.408	-1.408	0.000	
Violating Paths:	25	25	0	
All Paths:	35747	35432	540	
DRVs				
	Nr nets(terms)	Worst Vio	Nr nets(terms)	
max_cap	0 (0)	0.000	0 (0)	
max_tran	22 (71)	-0.831	22 (71)	
max_fanout	0 (0)	0	0 (0)	
max_length	0 (0)	0	0 (0)	
Density: 19.404%				
Total number of glitch violations: 1				

innovus #> report_timing -path_type summary_slack_only

```
#####  
#  Generated by:      Cadence Innovus 20.14-s095_1  
#  OS:                Linux x86_64(Host ID myserver)  
#  Generated on:      Wed Jun 30 21:31:52 2021  
#  Design:            asic_entity  
#  Command:           report_timing -path_type summary_slack_only  
#####
```

Point	Slack	Cause	View	Begin Point	End
coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re	coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ida	-0.137	VIOLATED	func_slow_max	
ta0/u0/id0/A[4] f					

```
innovus #> report_timing -retime path_slew_propagation -retime_mode exhaustive -path_type
summary_slack_only
```

```
#####  
#  Generated by:      Cadence Innovus 20.14-s095_1  
#  OS:                Linux x86_64(Host ID myserver)  
#  Generated on:       Wed Jun 30 21:30:54 2021  
#  Design:            asic_entity
```

```
# Command:          report_timing -retime path_slew_propagation -retime_mode exhaustive -path_type
summary_slack_only
#####

+-----+
-----+
      |                                     Begin Point |                               End
Point | Slack |   Cause |           View |
|-----+-----+-----+-----+-----+-----+-----+-----+-----+
--+-----|
      | coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/ |
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_bur | -0.122 | VIOLATED | func_slow_max |
      |                                     Q1[11] f |
st/DFF/D r |           |           |           |

+-----+
-----+
INFO: Path Based Analysis (PBA) performed on total '305' paths
INFO: Max depth 160 reached for end point
'coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/idata0/u0/id0/A[4]' during Path Based Analysis
```

```
innovus #> report_timing -retime path_slew_propagation -retime_mode exhaustive -path_type
summary_slack_only -max_paths 10000
```

```
**WARN: (TCLCMD-1248): Since no '-max_slack' has been specified with exhaustive '-retime_mode', tool will
assume it's default value in this case which is '0'
```

```
#####
# Generated by:      Cadence Innovus 20.14-s095_1
# OS:                Linux x86_64(Host ID myserver)
# Generated on:      Wed Jun 30 22:24:49 2021
# Design:            asic_entity
# Command:           report_timing -retime path_slew_propagation -retime_mode exhaustive -path_type
summary_slack_only -max_paths 10000
#####
```

```
+-----+
-----+
      |                                     Begin Point |                               End
Point | Slack |   Cause |           View |
|-----+-----+-----+-----+-----+-----+-----+-----+-----+
--+-----|
      | coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/ |
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_val | -0.141 | VIOLATED | func_slow_max |
```

				Q1[11] f
id_0/DFF/D r				
	coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/			
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_val	-0.127	VIOLATED	func_slow_max	
				Q1[11] f
id_2/DFF/D r				
	coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/			
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_val	-0.123	VIOLATED	func_slow_max	
				Q1[11] f
id_3/DFF/D r				
	coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/			
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_bur	-0.122	VIOLATED	func_slow_max	
				Q1[11] f
st/DFF/D r				
	coreinst/ks_core1/leon1/proc0/cmем0/dtags0/u0/id0/			
coreinst/ks_core1/leon1/proc0/c0/dcache0/r_reg_val	-0.114	VIOLATED	func_slow_max	
				Q1[11] f
id_1/DFF/D r				

innovus #> report_timing -retime path_slew_propagation -retime_mode path -path_type summary_slack_only -max_paths 10000 > excerpt

INFO: Path Based Analysis (PBA) performed on total '10000' paths

linux prompt \$ head -20 excerpt

```
#####
# Generated by: Cadence Innovus 20.14-s095_1
# OS: Linux x86_64(Host ID myserver)
# Generated on: Wed Jun 30 22:14:46 2021
# Design: asic_entity
# Command: report_timing -retime path_slew_propagation -retime_mode path -path_type
summary_slack_only -max_paths 10000 > excerpt
#####
```

-----+-----				
-----+-----				
Point	Slack	Cause	View	Begin Point End
-----+-----+-----+-----				
--+-----				
		coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re		
coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ida	-0.037	VIOLATED	func_slow_max	
		g_ldbp1/DFF/Q r		
ta0/u0/id0/A[4] f				
		coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re		
coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ida	-0.027	VIOLATED	func_slow_max	
		g_ldbp1/DFF/Q r		
ta0/u0/id0/A[6] f				
		coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re		
coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ita	-0.015	VIOLATED	func_slow_max	
		g_ldbp1/DFF/Q r		
gs0/u0/id0/A[2] f				
		coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re		
coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ita	-0.006	VIOLATED	func_slow_max	
		g_ldbp1/DFF/Q r		
gs0/u0/id0/A[4] f				
		coreinst/ks_core1/amba_dsp1/mcore0/proc0/iu0/ex_re		
coreinst/ks_core1/amba_dsp1/mcore0/proc0/cmем0/ida	-0.008	VIOLATED	func_slow_max	
		g_ldbp1/DFF/Q r		
ta0/u0/id0/A[5] f				

the above output is NOT sorted
manual reorder by slack

linux prompt\$ grep VIOLATED excerpt | cut -d "|" -f4 | sort -n

-0.141

-0.127

-0.123

-0.122

-0.114

-0.075
-0.072
-0.037
-0.037
-0.033
-0.027
-0.024
-0.020
-0.015
-0.011
-0.008
-0.006
-0.002
-0.001