

You are here: Synthesis Man Pages > **Synthesis Tool Commands** > **r** > report\_timing

---

# report\_timing

## NAME

## SYNTAX

## ARGUMENTS

## DESCRIPTION

## EXAMPLES

## SEE ALSO

---

## NAME

### report\_timing

Displays timing information about a design.

## SYNTAX

```
status report_timing
  [-to to_list
    | -rise_to rise_to_list
    | -fall_to fall_to_list]
  [-from from_list
    | -rise_from rise_from_list
    | -fall_from fall_from_list]
  [-through through_list
    | -rise_through rise_through_list
    | -fall_through fall_through_list]
  [-exclude exclude_list
    | -rise_exclude rise_exclude_list
    | -fall_exclude fall_exclude_list]
  [-path_type short | full | full_clock | full_clock_expanded | only | end]
  [-delay_type min | min_rise | min_fall | max | max_rise | max_fall]
  [-nworst paths_per_endpoint]
  [-max_paths max_path_count]
  [-input_pins]
  [-nets]
  [-transition_time]
  [-crosstalk_delta]
  [-capacitance]
  [-effective_capacitance]
  [-attributes]
  [-physical]
  [-slack_greater_than greater_slack_limit]
  [-slack_lesser_than lesser_slack_limit]
  [-lesser_path max_path_delay]
  [-greater_path min_path_delay]
  [-loops]
  [-enable_preset_clear_arcs]
  [-significant_digits digits]
  [-nosplit]
  [-sort_by group | slack]
  [-group group_name]
  [-trace_latch_borrow]
  [-derate]
  [-normalized_slack]
  [-scenarios scenario_list]
  [-temperature]
  [-voltage]
  [-unique_pins]
  [-start_end_pair]
  [-variation]
```

```
[-ignore_infeasible_paths]
```

## Data Types

<i>to_list</i>	list
<i>rise_to_list</i>	list
<i>fall_to_list</i>	list
<i>from_list</i>	list
<i>rise_from_list</i>	list
<i>fall_from_list</i>	list
<i>through_list</i>	list
<i>rise_through_list</i>	list
<i>fall_through_list</i>	list
<i>exclude_list</i>	list
<i>rise_exclude_list</i>	list
<i>fall_exclude_list</i>	list
<i>paths_per_endpoint</i>	integer
<i>max_path_count</i>	integer
<i>greater_slack_limit</i>	float
<i>lesser_slack_limit</i>	float
<i>max_path_delay</i>	float
<i>min_path_delay</i>	float
<i>digits</i>	integer
<i>group_name</i>	string
<i>scenario_list</i>	list

## ARGUMENTS

### **-to** *to\_list*

Reports only the paths to the named pins, ports, or clocks. If you do not specify the **-to** option, the default is to report the longest path to an output port if the design has no timing constraints. If the design has timing constraints, the default is to report the path with the worst slack within each path group if the **-group** option is not present. If the **-group** option is given, the default is to report the path with the worst slack within the group specified by the **-group** option.

### **-rise\_to** *rise\_to\_list*

Same as the **-to** option, but applies only to paths rising at the endpoint. If a clock object is specified, this option selects endpoints clocked by the named clock, but only the paths captured by the rising edge of the clock at clock source, taking into account any logical inversions along the clock path.

### **-fall\_to** *fall\_to\_list*

Same as the **-to** option, but applies only to paths falling at the endpoint. If a clock object is specified, this option selects endpoints clocked by the named clock, but only the paths captured by the falling edge of the clock at the clock source, taking into account any logical inversions along the clock path.

### **-from** *from\_list*

Reports only the paths from the named pins, ports, or clocks. If you do not specify the **-from** option, the default is to report the longest path to an output port if the design has no timing constraints. If the design has timing constraints, the default is to report the path with the worst slack within each path group if the **-group** option is not present. If the **-group** option is given, the default is to report the path with the worst slack within the group specified by the **-group** option.

### **-rise\_from** *rise\_from\_list*

Same as the **-from** option, except that the path must rise from the objects specified. If a clock object is specified, this option selects startpoints clocked by the named clock, but only the paths launched by the rising edge of the clock at the clock source, taking into account any logical inversions along the clock path.

### **-fall\_from** *fall\_from\_list*

Same as the **-from** option, except that the path must fall from the objects specified. If a clock object is specified, this option selects startpoints clocked by the named clock, but only the paths launched by the falling edge of the clock at the clock source, taking into account any logical inversions along the clock path.

**-through** *through\_list*

Reports only paths that pass through the named pins, ports, or clocks. If you do not specify the **-through** option, the default is to report the longest path to an output port if the design has no timing constraints. If the design does have timing constraints, the default is to report the path with the worst slack within each path group if the **-group** option is not present. If the **-group** option is given, the default is to report the path with the worst slack within the group specified by the **-group** option.

If you specify the **-through** option only one time, the tool reports only the paths that travel through one or more of the objects in the list. You can specify the **-through** option more than one time in one command invocation. For a discussion of the use of multiple **-through** options, see the DESCRIPTION section.

**-rise\_through** *rise\_through\_list*

Reports only paths with a rising transition at the specified objects. This option is similar to the **-through** option. You can specify the **-rise\_through** option more than one time in a single command invocation. For a discussion of multiple **-through**, **-rise\_through**, and **-fall\_through** options, see the DESCRIPTION section.

**-fall\_through** *fall\_through\_list*

Reports only paths with a falling transition at the specified objects. This option is similar to the **-through** option. You can specify the **-fall\_through** option more than one time in a single command invocation. For a discussion of multiple **-through**, **-rise\_through**, and **-fall\_through** options, see the DESCRIPTION section.

**-exclude** *exclude\_list*

Prevents reporting of all data paths from/through/to the named pins, ports, nets, and cell instances. Any data path that starts from, contains, or ends on a listed object is excluded from reporting. If you specify a cell instance, data paths that include any pin of that cell instance are excluded. This option has higher precedence than the **-from**, **-through**, **-to**, and similar options.

The exclusion does not apply to clock paths, even when the **-path\_type full\_clock** or **-path\_type full\_clock\_expanded** option is used. It does not apply to borrowing path from the **-trace\_latch\_borrow** option.

This option is not applied to clock pins.

**-rise\_exclude** *rise\_exclude\_list*

Same as the **-exclude** option, but applies only to paths rising at the named pins, ports, nets, and cell instances.

**-fall\_exclude** *fall\_exclude\_list*

Same as the **-exclude** option, but applies only to paths falling at the named pins, ports, nets, and cell instances.

**-path\_type** *short | full | full\_clock | full\_clock\_expanded | only | end*

Specifies how to display the timing path. By default, the full path is displayed. The following values are valid:

- If **full\_clock** is specified, the report is similar to the report you get with **full** but also reports the full clock paths for propagated clocks.
- If **full\_clock\_expanded** is specified, the report is similar to the report you get with **full\_clock** but also reports the full clock path from the primary clock to the related generated clock source.
- If **short** is specified, only startpoints and endpoints are displayed.
- If **only** is specified, only the path is displayed without the accompanying required-time and slack calculation.
- If **end** is specified, the report has a column format that shows one line for each path, showing only

the endpoint path total, required-time, and slack.

**-delay\_type** *min | min\_rise | min\_fall | max | max\_rise | max\_fall*

Specifies the path type at the endpoint. The default is **max**.

**-nworst** *paths\_per\_endpoint*

Specifies the maximum number of paths to report per endpoint. The default is 1, which reports only the single worst path ending at a given endpoint.

**-max\_paths** *max\_path\_count*

Specifies the number of paths to report per path group by default, or the number of paths to report for the whole design if the **timing\_report\_fast\_mode** variable is set to true. The default is 1.

**-input\_pins**

Shows input pins in the path report. The default is to show only output pins. This option also shows the delays of the nets connected to these pins.

**-nets**

Shows nets in the path report. The default is not to show nets. To show the delay for the nets, use the **-input\_pins** option.

**-transition\_time**

Shows the net transition time for each driving pin in the path report. The default is not to show the net transition time for each driving pin.

**-crosstalk\_delta**

Shows the delta delay for each input pin in the path report. The default is not to show the delta delay for each input pin.

**-capacitance**

Causes the total (lumped) capacitance to be shown in the path report. The default is not to show capacitance. For each driver pin, the total capacitance driven by the driver is displayed in a column preceding both incremental path delay and transition time (specified with the **-transition\_time** option). When the **-nets** option is specified, the capacitance is printed on the lines with nets instead of the lines with driver pins.

**-effective\_capacitance**

Causes the effective capacitance for nets, calculated by the Arnoldi method, to be shown in the path report. For each driver pin, the worst effective capacitance among all of the driver arcs is displayed in a column labeled "Ceff". When the **-nets** option is used, the effective capacitance is shown in the lines reporting the nets, rather than the driver pins. Only capacitance values calculated by the Arnoldi method are shown in the "Ceff" column; where capacitance is calculated by another method, the "Ceff" column is left blank.

**-attributes**

Shows the attributes specified in the **timing\_report\_attributes** variable. The supported attributes are **dont\_touch**, **dont\_use**, **map\_only**, **infeasible\_paths** (for the Design Compiler and DC Explorer tools), **size\_only** for cells, **dont\_touch** for cells and nets, and **ideal\_net** for nets.

**-physical**

Shows the locations of the pins and the capacitive loads for the pins and nets in the path report. The loads are displayed as a pair of values with the first value being the wire capacitance of the net and the second value being the total capacitance driven by the driver. If the pin location cannot be determined, the cell location is displayed, with the coordinates in microns.

**-slack\_greater\_than** *greater\_slack\_limit*

Specifies that only those paths with a slack greater than *greater\_slack\_limit* are to be reported. This option can be combined with **-slack\_lesser\_than** to report only those paths inside or outside a given slack range.

**-slack\_lesser\_than** *lesser\_slack\_limit*

Specifies that only those paths with a slack less than *lesser\_slack\_limit* are to be reported. This option can be combined with **-slack\_greater\_than** to report only those paths inside or outside a given slack range.

**-lesser\_path** *max\_path\_delay*

Selects only those paths with a delay less than *max\_path\_delay*. Combine this option with the **-greater\_path** option to select only those paths inside or outside a given delay range.

**-greater\_path** *min\_path\_delay*

Selects only those paths with a delay greater than *min\_path\_delay*. Combine this option with the **-lesser\_path** option to select only those paths inside or outside a given delay range.

**-loops**

Reports only the timing loops in the design.

**-enable\_preset\_clear\_arcs**

Enables asynchronous timing arcs for this report. By default, asynchronous timing arcs are disabled during all timing verification. This option allows you to see the timing with these arcs enabled. Only the current report is affected.

**-significant\_digits** *digits*

Specifies the number of digits to the right of the decimal point to report. Allowed values are from 0 through 13. The default is 2. Using this option overrides the value set by the **report\_default\_significant\_digits** variable.

**-nosplit**

Prevents line splitting and facilitates writing application to extract information from the report output. Most of the design information is listed in fixed-width columns. If the information in a given field exceeds the column width, the next field begins on a new line, starting in the correct column.

**-sort\_by** *group | slack*

Specifies the order in which the paths are reported. The default **-sort\_by** key is **group**. By default, paths are sorted by costing groups. Within each group, the paths are ordered by slack. With **slack**, the paths are ordered by slack only.

**-group** *group\_name*

Specifies the path group from which timing paths are selected for reporting, based on other specified options for reports. If the **-group** option is not specified, the reported paths are a subset of paths from all path groups. This option cannot be used with the **-loops** option.

**-trace\_latch\_borrow**

Controls the type of report generated for a path that starts at a transparent latch. If the path startpoint borrows from the previous stage, using this option causes the report to show the entire set of borrowing paths that lead up to the borrowing latch, starting with a nonborrowing path or a noninverting sequential loop. By default, the report shows only the last path in the sequence of borrowing stages. Each stage is reported separately, showing the time borrowed and lent and the endpoints of the stage. The cumulative amount of borrowed time along a sequence of stages is not included in the report. The **-input\_pins**, **-nets**, **-transition\_time**, **-capacitance**, and **-significant\_digits** options apply to every stage in the sequence of borrowing paths, but the remaining options (for example, **-from**) apply only to the last stage reported.

**-derate**

Prints timing derate values for each path element. By default, no derate value is printed. When this option

is specified, the **-input\_pins** and **-nets** options are automatically turned on. Input delay and ideal clock network latency is not derated.

**-normalized\_slack**

Paths are gathered and sorted using normalized slack instead of slack. Normalized slack divides the slack by an idealized allowed propagation delay. In order to use this option, you must run the **update\_timing** command with the **timing\_enable\_normalized\_slack** variable set to true.

**-scenarios *scenario\_list***

Reports each scenario in the list separately, with up to **-max\_paths** paths reported for each scenario. Inactive scenarios are skipped in the report. If this option is not given, only the current scenario is reported.

**-temperature**

Reports the operating condition temperature for each path element for multivoltage designs.

**-voltage**

Reports the operating condition voltage for each path element for multivoltage designs. When the operating condition for a macro, switch, or pad cell is inferred from other library cells, a tilde character (~) is displayed next to the voltage value in the timing report.

**-unique\_pins**

Causes only the single worst timing path through any given sequence of pins to be reported. No other paths are reported for the same sequence of pins from startpoint to endpoint. For example, if the worst path starts with a rising edge at the first pin of a pin sequence, then paths starting with a falling edge are not reported for that sequence. For non-unate logic such as XOR gates, this greatly reduces the number of paths reported because of the large number of possible rising/falling edge combinations through the sequence of pins. Using this option can require longer runtimes when used with the **-nworst *n*** option because many paths must be analyzed to find the worst path through each pin sequence, but only the worst path is reported and counted toward the total number of requested paths.

**-start\_end\_pair**

Limits reporting to the single worst timing path per each combination of startpoint and endpoint found. No other paths are reported that have the same startpoint and same endpoint. For example, if the worst path starts at a register clock pin ff1/CK and ends at a register input pin ff5/D, the report omits all other less critical paths from ff1/CK to ff5/D. Using this option can require longer runtimes when used with the **-nworst *n*** option because many paths must be analyzed to find the worst path through each pin pair, but only the worst path in each case is reported and counted toward the total number of requested paths.

**-variation**

Reports the mean and standard deviation of the statistical time increment for each path element. This option works only when parametric on-chip variation (POCV) analysis has been enabled by setting the **timing\_pocvm\_enable\_analysis** variable to true. By default, statistical parameters are not reported.

**-ignore\_infeasible\_paths**

Ignores all paths flagged as infeasible during the latest compilation.

## DESCRIPTION

The **report\_timing** command provides a report of timing information for the current design. By default, the **report\_timing** command reports the single worst setup path in each clock group.

The command options let you specify the number of paths reported, the types of paths reported, and the amount of detail included in the report. You can restrict the scope of paths reported by startpoints, endpoints, and intermediate points by using the **-from**, **-to**, and **-through** options; and by slack or clock group by using the **-slack\_lesser\_than** and **-group** options.

The timing report starts by showing the primary command settings, operating conditions, path startpoint, path endpoint, path group name, and path timing check type (max for a setup check, min for a hold check, and so on).

A table in the report shows point-by-point accounting of the delays along the path from the startpoint to the endpoint. The default table has columns labeled Point, Incr, and Path. These columns list the points (cell pins) along the path, the incremental contribution to the delay at each point, and the cumulative delay up to that point, respectively. Hierarchical boundary crossings are listed as well, showing zero incremental delay at each crossing. You can optionally display net delays in the report by using the **-input\_pins** option and net names by using the **-nets** option.

The symbols "r" and "f" in the Path column indicate the sense of the signal transition, either rising or falling, at that point in the path.

For a setup check, the path starts with the launch clock edge and ends at the data input of the capture device. The data arrival time shown in the table is the amount of elapsed time from the source of the launch clock edge to the arrival of data at the endpoint, taking into consideration the longest possible delays along the path.

Following this is the accounting for the required arrival time. The data required time shown in the table is the latest allowable arrival time for the data at the path endpoint, taking into account the nominal capture clock edge time, the clock network delay, the clock uncertainty, the least possible delay along the clock path, and the library setup time requirement for the capture device.

The slack value shown at the end of the report is the data required time minus the data arrival time. This represents the amount of time by which the timing constraint is met.

Back-annotations on path elements in the timing path are indicated by a character symbol in the Incr column. If the **-input\_pins** option is used, each pin-to-pin delay spans either a net or cell. The symbol shown refers to the dominant annotation on each path element. (Certain annotations dominate others; for example, SDF takes precedence over back-annotated RC parasitics.)

Symbol	Annotation
-----	-----
^	Ideal network latency annotation
*	Back-annotation using SDF or preroute Elmore extraction
&	RC network back-annotation using Elmore delay calculation
#	Estimated delay for high-fanout net
z	Zero delay due to set_zero_interconnect_delay_mode
<none>	Wire-load model or none

You can use multiple **-through** options in a single command to specify paths that traverse multiple points in the design. The following example specifies paths beginning at A1, passing through B1, then through C1, and ending at D1:

```
prompt> report_timing -from A1 -through B1 -through C1 -to D1
```

If more than one object is specified within one **-through** option, the path can pass through any of the objects. The following example specifies paths beginning at A1, passing through either B1 or B2, then passing through either C1 or C2, and ending at D1:

```
prompt> report_timing -from A1 -through {B1 B2} -through {C1 C2} -to D1
```

Creation and usage of scenarios is available with Design Compiler Graphical.

## Multicorner-Multimode Support

By default, this command uses information from the current scenario. You can select different scenarios by using the **-scenarios** option. The only exception is the clock object, which only comes from current scenario.

## EXAMPLES

The following example shows a timing report using only the default values:

```
prompt> report_timing
```

```
*****
Report : timing
        -path full
        -delay max
        -max_paths 1
Design : led
Version: v3.1a
Date   : Tue Apr  7 16:23:02 1992
*****
```

```
Operating Conditions:
Wire Loading Model Mode: top
```

```
Startpoint: c (input port)
Endpoint: z2 (output port)
Path Group: default
Path Type: max
```

Point	Incr	Path
-----		
input external delay	0.00	0.00 r
c (in)	0.00	0.00 r
u1/Z (IVA)	0.54	0.54 f
u0/Z (NR2)	1.20	1.74 r
u8/Z (IVA)	0.43	2.17 f
u7/Z (OR3)	1.24	3.41 f
z2 (out)	0.00	3.41 f
data arrival time		3.41
max_delay	0.00	0.00
output external delay	0.00	0.00
data required time		0.00
-----		
data required time		0.00
data arrival time		-3.41
-----		
slack (VIOLATED)		-3.41

The following example reports the longest path to Z1, without required-time and slack calculation:

```
prompt> report_timing -to z1 -nworst 2 -path_type only
```

```
*****
Report : timing
        -path only
        -delay max
        -nworst 2
        -max_paths 2
Design : led
Version: v3.1a
Date   : Tue Apr  7 16:52:43 1992
*****
```

```
Operating Conditions:
Wire Loading Model Mode: top
```

```
Startpoint: c (input port)
Endpoint: z1 (output port)
Path Group: default
Path Type: max
```

Point	Incr	Path
-----		
input external delay	0.00	0.00 f
c (in)	0.00	0.00 f
u1/Z (IVA)	0.60	0.60 r
u17/Z (A07)	0.53	1.13 f
u18/Z (OR3)	1.24	2.37 f
z1 (out)	0.00	2.37 f



```

data arrival time                                2.37
-----

Startpoint: d (input port)
Endpoint: z1 (output port)
Path Group: default
Path Type: max

Point                                     Incr      Path
-----
input external delay                     0.00      0.00 f
d (in)                                   0.00      0.00 f
u20/Z (IVA)                             0.53      0.53 r
u17/Z (AO7)                             0.53      1.06 f
u18/Z (OR3)                             1.24      2.30 f
z1 (out)                                 0.00      2.30 f
data arrival time                        2.30
-----

```

The following example reports the endpoint path delay, required time, and slack for each path:

```

prompt> report_timing -path_type end

*****
Report : timing
        -path end
        -delay max
Design : led
Version: v3.1a
Date   : Tue Apr  7 16:28:07 1992
*****

Operating Conditions:
Wire Loading Model Mode: top

Endpoint          Path Delay      Path Required      Slack
-----
z2                 3.41 f              0.00             -3.41
z3                 3.03 f              0.00             -3.03
z4                 2.77 f              0.00             -2.77
z6                 2.69 r              0.00             -2.69
z0                 2.59 f              0.00             -2.59
z1                 2.37 f              0.00             -2.37
z5                 2.26 f              0.00             -2.26

```

The following example reports the startpoints and endpoints of the path from a to z2:

```

prompt> report_timing -from a -to z2 -path_type short

*****
Report : timing
        -path short
        -delay max
        -max_paths 1
Design : led
Version: v3.1a
Date   : Tue Apr  7 16:29:40 1992
*****

Operating Conditions:
Wire Loading Model Mode: top

Startpoint: a (input port)
Endpoint: z2 (output port)
Path Group: default
Path Type: max

Point                                     Incr      Path
-----
input external delay                     0.00      0.00 f
a (in)                                   0.00      0.00 f
...

```

z2 (out)	1.24	1.24 f
data arrival time		1.24
max_delay	0.00	0.00
output external delay	0.00	0.00
data required time		0.00
-----		
data required time		0.00
data arrival time		-1.24
-----		
slack (VIOLATED)		-1.24

The following example shows input pins in the report, in addition to the default values:

```
prompt> report_timing -input_pins
```

```
*****
Report : timing
        -path full
        -delay max
        -input_pins
        -max_paths 1
Design : led
Version: v3.1a
Date   : Tue Apr  7 16:32:28 1992
*****
```

```
Operating Conditions:
Wire Loading Model Mode: top
```

```
Startpoint: c (input port)
Endpoint: z2 (output port)
Path Group: default
Path Type: max
```

Point	Incr	Path
-----		
input external delay	0.00	0.00 r
c (in)	0.00	0.00 r
u1/A (IVA)	0.00	0.00 r
u1/Z (IVA)	0.54	0.54 f
u0/A (NR2)	0.00	0.54 f
u0/Z (NR2)	1.20	1.74 r
u8/A (IVA)	0.00	1.74 r
u8/Z (IVA)	0.43	2.17 f
u7/B (OR3)	0.00	2.17 f
u7/Z (OR3)	1.24	3.41 f
z2 (out)	0.00	3.41 f
data arrival time		3.41
max_delay	0.00	0.00
output external delay	0.00	0.00
data required time		0.00
-----		
data required time		0.00
data arrival time		-3.41
-----		
slack (VIOLATED)		-3.41

The following example shows input pins and nets in the report, and does not show required time and slack calculation:

```
prompt> report_timing -input_pins -nets -path_type only
```

```
*****
Report : timing
        -path only
        -delay max
        -input_pins
        -nets
        -max_paths 1
Design : led
```

```

Version: v3.1a
Date   : Tue Apr  7 16:34:20 1992
*****

```

```

Operating Conditions:
Wire Loading Model Mode: top

```

```

Startpoint: c (input port)
Endpoint: z2 (output port)
Path Group: default
Path Type: max

```

Point	Incr	Path
-----	-----	-----
input external delay	0.00	0.00 r
c (in)	0.00	0.00 r
c (net)	0.00	0.00 r
u1/A (IVA)	0.00	0.00 r
u1/Z (IVA)	0.54	0.54 f
cell124/n22 (net)	0.00	0.54 f
u0/A (NR2)	0.00	0.54 f
u0/Z (NR2)	1.20	1.74 r
cell124/n21 (net)	0.00	1.74 r
u8/A (IVA)	0.00	1.74 r
u8/Z (IVA)	0.43	2.17 f
cell124/n19 (net)	0.00	2.17 f
u7/B (OR3)	0.00	2.17 f
u7/Z (OR3)	1.24	3.41 f
z2 (net)	0.00	3.41 f
z2 (out)	0.00	3.41 f
data arrival time		3.41
-----	-----	-----

## SEE ALSO

```

create_scenario(2)
current_scenario(2)
report_constraint(2)
set_operating_conditions(2)
set_timing_derate(2)
set_timing_ranges(2)
set_wire_load_min_block_size(2)
set_wire_load_mode(2)
set_wire_load_model(2)
set_wire_load_selection_group(2)
report_default_significant_digits(3)
timing_pocvm_enable_analysis(3)
timing_report_attributes(3)
timing_report_fast_mode(3)

```