7. Timing Domain

7.1 Data Arrival Time

Specify when transitions on data signals arrive at a port or pin.

7.1.1 Usage

\texttt{data\_arrival\_time}

\begin{verbatim}
[-waveform \texttt{<waveform\_name>} [-lead | -trail] [-early | -late] [-rise | -fall]
[-ports { <port\_name>+ }] [-pins { <pin\_name>+}]
arrival\_time\_value
\end{verbatim}

7.1.2 Required Keywords

-\texttt{waveform \texttt{waveform\_name}}

The ideal waveform used as a reference point for the \texttt{arrival\_time\_value}. This is usually the clock waveform for an external register that drives the ports or pins.

-\texttt{ports \{ port\_name+ \}}

The set of ports to which the arrival time applies. Either –\texttt{ports} or –\texttt{pins} (or both) must be specified.

-\texttt{pins \{ pin\_name+ \}}

The set of pins to which the arrival time applies. Either –\texttt{ports} or –\texttt{pins} (or both) must be specified.

7.1.3 Optional Keywords

-\texttt{lead} | -\texttt{trail}

The edge of the ideal waveform used as a reference point for the \texttt{arrival\_time\_value}.

-\texttt{early} | -\texttt{late}

The type of analysis. If not specified, both types of analysis are implied.

-\texttt{rise} | -\texttt{fall}

The data transition. If not specified, both transitions are implied.

7.1.4 Positional Parameters

\texttt{arrival\_time\_value}

The time(s) at which the transition(s) occur. Either a single number or a list of four numbers.

7.1.5 Semantics

Extended description here.
7.1.6 Examples

data_arrival_time -waveform sys_clk -lead \
   -ports {in1 in2} -early -rise 5.0

data_arrival_time -waveform sys_clk -trail \
   -ports {in3} {1.0 1.1 1.2 1.3 }

7.1.7 Related Constraints

clock, waveform, clock_arrival_time

7.1.8 Syntax

\[
data\_arrival\_time\_spec \; :\; = \; data\_arrival\_time\; arg+ \\
arg \; :\; = \; keyword \\
\|\|\; positional\_parameter \\
\]

keyword \; :\; = \; required\_keyword \\
\|\|\; = \; optional\_keyword \\

required\_keyword \; :\; = \; waveform\_keyword \\
\|\|\; = \; ports\_or\_pins \\

waveform\_keyword \; :\; = \; -waveform\; waveform\_name \\
waveform\_name \; :\; = \; identifier \\

ports\_or\_pins \; :\; = \; ports \\
\|\|\; = \; pins \\
ports \; :\; = \; -ports\; \{ \; port\_name+ \; \} \\
pins \; :\; = \; -pins\; \{ \; pin\_name+ \; \} \\
port\_name \; :\; = \; identifier \\
pin\_name \; :\; = \; identifier \\

optional\_keyword \; :\; = \; waveform\_edge \\
\|\|\; = \; analysis\_type \\
\|\|\; = \; data\_transition \\

waveform\_edge \; :\; = \; -lead \\
\|\|\; = \; -trail \\
analysis\_type \; :\; = \; -early \\
\|\|\; = \; -late \\

data\_transition \; :\; = \; -rise \\
\|\|\; = \; -fall \\

positional\_parameters \; :\; = \; arrival\_time\_value \\
arrival\_time\_value \; :\; = \; number \\
\|\|\; \{ \; early\_rise \; late\_rise \; early\_fall \; late\_fall \; \} \\
early\_rise \; :\; = \; number\_or\_placeholder \\
early\_fall \; :\; = \; number\_or\_placeholder
late_rise ::= number_or_placeholder
late_fall ::= number_or_placeholder

number_or_placeholder ::= number
||= *
