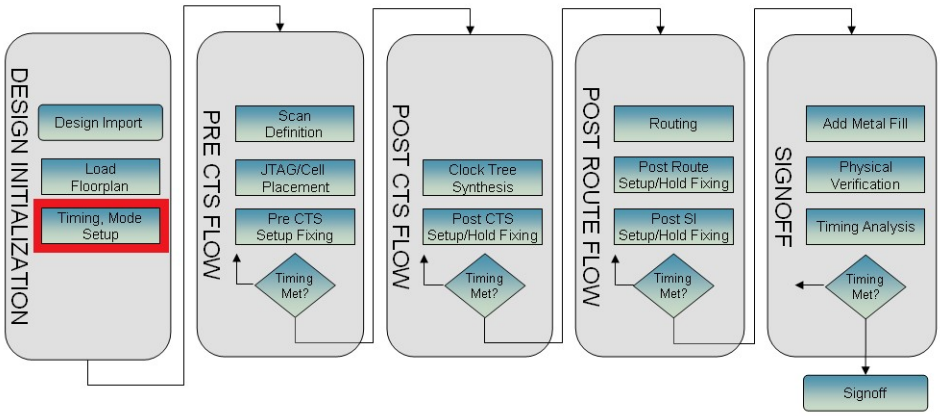
Timing and Mode setup

Introduction

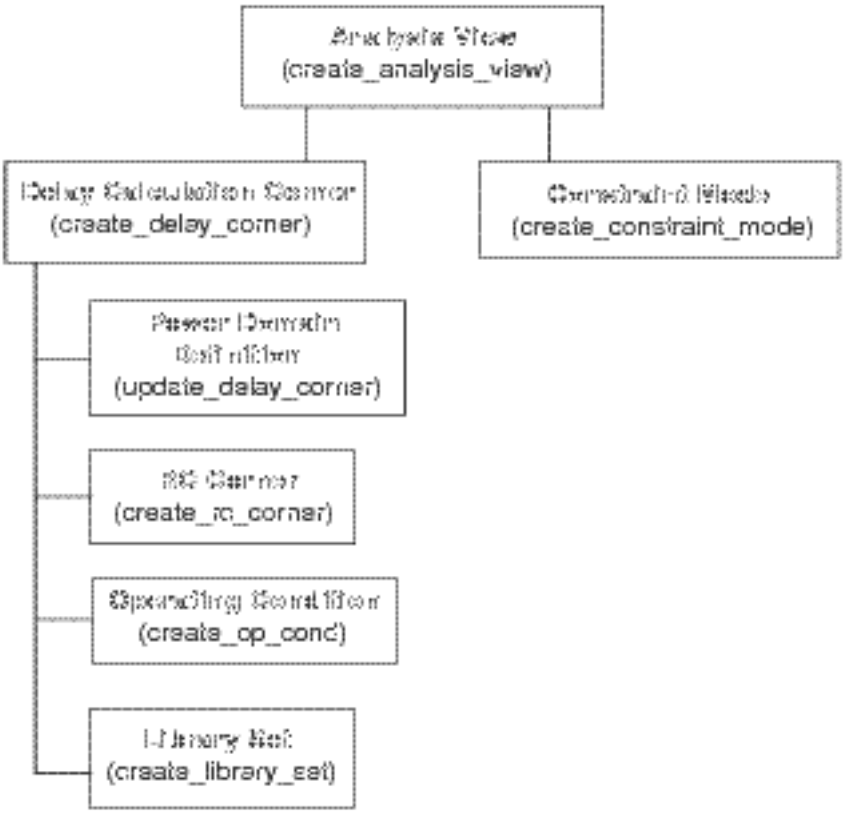
Multi-mode multi-corner analysis and optimization provides the ability to configure the software to support multiple combinations of modes and corners, and to evaluate them concurrently. EDI uses a tiered approach to assemble this necessary information for timing analysis and optimization.

Where Timing Mode Setup is done in the flow:



Configuring the setup for MMMC

The top level definition called the analysis_view composed of a delay calculation corner and constraint mode is used to represent the design variations that are being analyzed, typical mode setup looks something like below:



One can use the MMMC Browser to hierarchically create the view configurations necessary for multi-mode multi-corner analysis. When the design is saved the EDI system saves the configuration as TCL commands into a view definition file. A view definition file can also be created manually to configure the design for MMMC analysis.

Creating and Editing Library Sets

Use the create_library_set command to group together multiple library files that define the std cells, memories and so forth. With this unique library sets can be defined to group together libraries for each delay corner or power domain. They can include the noise libraries in addition to timing libraries.

Use update_library_set to change the timing and cdB library files in an already existing library set. Or to do this from the GUI:
Choose *Design - Import Design,* click the *Advanced* tab, select *MMMC*, click the *MMMC Browse* button, and double click on the name of the library set you want to edit.

Creating and Editing Virtual Operating Conditions

Use the create_op_cond command to define a PVT operating point when there are no predefined operating conditions in the user timing libraries, or the pre-existing operating conditions are not consistent with the user's operating environment.

The attributes for a defined virtual operating condition can be edited using the *Edit Operating Condition* form. If the edits are done after the MMMC file was already loaded it will reset all the timing, delay and rc information for all the analysis views. Choose *Design - Import Design*, click the *Advanced* tab, select *MMMC*, click the *MMMC Browse* button, and double click on the name of the operating condition you want to edit.

Creating and Editing RC Corner Objects

Use create_rc_corner command to create an RC corner object that is used to extract, annotate and use the RCs for delay calculation.

Use update_rc_corner to make changes to an existing RC corner object. You also can make changes to an RC corner object using the *Edit RC Corner* form:

Choose *Design - Import Design*, click the *Advanced* tab, select *MMMC*, click the *MMMC Browse* button, and double click on the name of the RC corner object you want to edit.

or:

Choose *Timing - Configure MMMC*, and double click on the name of the RC corner object to be edited.

Creating and Editing Delay Corner Objects

Use the create_delay_corner command to create the Delay Corner object which provides the information that controls the delay calculation for a specific analysis view. Multiple analysis views can share the same delay corner object.

Use the update_delay_corner command to make changes to a delay corner object.

Adding a Power Domain Definition to a Delay Calculation Corner

If a design includes power domains, the delay calculation corner can contain domain-specific subsections that specify the required operating condition information, and any necessary timing library rebinding for the power domain.

Use update_delay_corner command to add the power domain information to the Delay Corner.

The power domain names that you intend to specify when using the createPowerDomain command to define the physical aspects of the domain must match the ones used here.

Creating and Editing a Constraint Mode

Use create_constraint_mode command to create a constraint mode object that defines a possible mode of design. The constraint mode consists of a list of SDC files. The SDC files can be shared across constraint modes and several analysis views can share a common constraint mode.

Use update_constraint_mode to edit an already existing constraint mode. To do this from the GUI, Choose *Design - Import Design*, click the *Advanced tab*, select *MMMC*, click the *MMMC Browse* button, and double click on the name of the constraint mode object you want to edit.

Creating and Editing Analysis Views

Use create_analysis_view to create the analysis view that consists of a delay corner and constraint mode objects.

Use update_analysis_view to make changes to the analysis view.

Setting Active Analysis Views

To specify the analysis views that are to be used for setup and hold analysis and optimization, use the set_analysis_views command. The active views represent the design variations that will be analyzed. Use this command to switch the analysis views throughout the design flow. EDI applications can handle the views concurrently or sequentially, depending on their individual capabilities. Libraries and data are loaded into the system, as required to support the selected set of active views.

Checking and Saving the Multi-Mode Multi-Corner Configuration

Use report_analysis_views to generate a hierarchical report of the MMMC configuration.
EDI system saves the multi-mode multi-corner configuration as Tcl commands in a view definition file. The view definition file contains all of the library set, RC corner, delay calculation corner, constraint mode, and analysis view definitions that you created. When the design is saved the view definition file is saved to the design directory and the configuration file is updated with a pointer to this file.

Example

An example MMMC setup file:
_____*viewDefinition.tcl*_____

```
#create library sets
create_library_set -name lib_slow -timing {./slow_test.lib}
create_library_set -name lib_fast -timing {./fast.lib}

#create Constraint Modes
create_constraint_mode -name mode_mission -sdc_files {./default.sdc}

#create RC Corners
create_rc_corner -name rc_slow
create_rc_corner -name rc_fast

#create Delay Corners
create_delay_corner -name dc_slow \
-late_library_set lib_slow \
-early_library_set lib_fast \
-late_opcond_library slowlib \
-early_opcond_library fastlib \
-late_opcond slow \
-early_opcond fast

create_delay_corner -name dc_fast \
-late_library_set lib_slow \
-early_library_set lib_fast \
-late_opcond_library slowlib \
-early_opcond_library fastlib \
-late_opcond slow \
-early_opcond fast

#create analysis views
create_analysis_view -name view_slow_mission -constraint_mode mode_mission -delay_corner dc_slow
create_analysis_view -name view_fast_mission -constraint_mode mode_mission -delay_corner dc_fast

#set current analysis views
set_analysis_view -setup {view_slow_mission} -hold {view_fast_mission}
```

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