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Virtuoso Concurrent Layout User Guide

Product Version ICADVM20.1
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Contents

Preface

Virtuoso Concurrent Layout creates an editing environment within Virtuoso that allows several designers to concurrently work on the same cellview. As the designers work in parallel, using Concurrent Layout helps in bringing down the designing time and as a result, increases productivity.

This preface contains the following topics:

Scope

The functionality described in this guide can be used only in ICADVM20.1 advanced nodes and advanced methodologies releases.

Licensing Requirements

Concurrent layout functionality requires either:

- A Virtuoso_Layout_Suite_XL license combined with 4 GXL flexible license tokens
- A Virtuoso_Layout_Suite_EXL license

The license is held until the last layout window is closed.

Note: If you switch from Layout XL to Layout EXL, the GXL tokens remain checked out. To prevent this, first close Layout XL and then open Layout EXL.

For information on licensing in the Virtuoso design environment, see *Virtuoso Software Licensing and Configuration User Guide*.

Related Documentation

This document does not contain information on all the functions and commands enabled in Layout XL and Layout EXL.

Commands that are implemented in a lower tier of the Virtuoso Layout Suite are covered in the documentation for the relevant application. For example, the Virtuoso Layout Suite L User Guide describes the basic Move command; the current document describes only its extended functionality.

Many of the features available in Concurrent Layout are described in dedicated user guides. Where this is the case, you will find specific references to the documents that contain the most detailed information.

What's New and KPNS

- *Virtuoso Concurrent Layout What's New*
- *Virtuoso Concurrent Layout Known Problems and Solutions*

Installation, Environment, and Infrastructure

- *Cadence Installation Guide*
- *Virtuoso Design Environment User Guide*
- *Virtuoso Design Environment SKILL Reference*
- *Cadence Application Infrastructure User Guide*

Technology Information

- *Virtuoso Technology Data User Guide*
- *Virtuoso Technology Data ASCII Files Reference*
- *Virtuoso Technology Data SKILL Reference*
- *Virtuoso Technology Data Constraint Reference*

Virtuoso Tools

- *Virtuoso Layout Viewer User Guide*
- *Virtuoso Layout Suite XL: Basic Editing User Guide*
- *Virtuoso Layout Suite XL: Connectivity Driven Editing Guide*
- *Virtuoso Layout Suite EXL Reference*
- *Virtuoso Concurrent Layout User Guide*
- *Virtuoso Design Planner User Guide*
- *Virtuoso Electromagnetic Solver Assistant User Guide*
- *Virtuoso Multi-Patterning Technology User Guide*
- *Virtuoso Placer User Guide*
- *Virtuoso RF Flow Guide*
- *Virtuoso Simulation Driven Interactive Routing User Guide*

Additional Learning Resources

Video Library

The Video Library on the Cadence Online Support website provides a comprehensive list of videos on various Cadence products.

To view a list of videos related to a specific product, you can use the *Filter Results* feature available in the pane on the left. For example, click the *Virtuoso Layout Suite* product link to view a list of videos available for the product.

You can also save your product preferences in the Product Selection form, which opens when you click the *Edit* icon located next to *My Products*.

Virtuoso Videos Book

You can access certain videos directly from Cadence Help. To learn more about this feature and to access the list of available videos, see Virtuoso Videos.

Rapid Adoption Kits

Cadence provides a number of Rapid Adoption Kits that demonstrate how to use Virtuoso applications in your design flows. These kits contain design databases and instructions on how to run the design flow.

In addition, Cadence offers the following training courses on Virtuoso Layout Suite XL:

- Virtuoso Layout Suites Update Training
- Virtuoso Connectivity-Driven Layout Transition
- Virtuoso Layout Pro: T3 Basic Commands (XL)
- Virtuoso Layout Pro: T4 Advanced Commands (XL)
- Virtuoso Layout for Advanced Nodes

To explore the full range of training courses provided by Cadence in your region, visit Cadence Training or write to training_enroll@cadence.com.

Note: The links in this section open in a separate web browser window when clicked in Cadence Help.

Help and Support Facilities

Virtuoso offers several built-in features to let you access help and support directly from the software.

- The Virtuoso *Help* menu provides consistent help system access across Virtuoso tools and applications. The standard Virtuoso *Help* menu lets you access the most useful help and support resources from the Cadence support and corporate websites directly from the CIW or any Virtuoso application.
- The Virtuoso Welcome Page is a self-help launch pad offering access to a host of useful knowledge resources, including quick links to content available within the Virtuoso installation as well as to other popular online content.

  The Welcome Page is displayed by default when you open Cadence Help in standalone mode from a Virtuoso installation. You can also access it at any time by selecting *Help – Virtuoso Documentation Library* from any application window, or by clicking the *Home* button on the Cadence Help toolbar (provided you have not set a custom home page).

For more information, see Getting Help in *Virtuoso Design Environment User Guide.*

Customer Support

For assistance with Cadence products:

- Contact Cadence Customer Support

  Cadence is committed to keeping your design teams productive by providing answers to technical questions and to any queries about the latest software updates and training needs. For more information, visit https://www.cadence.com/support.

- Log on to Cadence Online Support

  Customers with a maintenance contract with Cadence can obtain the latest information about various tools at https://support.cadence.com.

Feedback about Documentation

You can contact Cadence Customer Support to open a service request if you:

- Find erroneous information in a product manual
- Cannot find in a product manual the information you are looking for
- Face an issue while accessing documentation by using Cadence Help

You can also submit feedback by using the following methods:

- In the Cadence Help window, click the *Feedback* button and follow instructions.
- On the Cadence Online Support Product Manuals page, select the required product and submit your feedback by using the *Provide Feedback* box.

Typographic and Syntax Conventions

The following typographic and syntax conventions are used in this manual.

text	Indicates names of manuals, menu commands, buttons, and fields.
`text`	Indicates text that you must type exactly as presented. Typically used to denote command, function, routine, or argument names that must be typed literally.
`z_argument`	Indicates text that you must replace with an appropriate argument value. The prefix (in this example, *`z_`*) indicates the data type the argument can accept and must not be typed.
|	Separates a choice of options.
`{ }`	Encloses a list of choices, separated by vertical bars, from which you **must** choose one.
`[ ]`	Encloses an optional argument or a list of choices separated by vertical bars, from which you **may** choose one.
`[ ?argName` *`t_arg`* `]`	Denotes a *key argument*. The question mark and argument name must be typed as they appear in the syntax and must be followed by the required value for that argument.
`...`	Indicates that you can repeat the previous argument. Used with brackets to indicate that you can specify zero or more arguments. Used without brackets to indicate that you must specify at least one argument.
`,...`	Indicates that multiple arguments must be separated by commas.
`=>`	Indicates the values returned by a Cadence® SKILL® language function.
`/`	Separates the values that can be returned by a Cadence SKILL language function.

If a command-line or SKILL expression is too long to fit within the paragraph margins of this document, the remainder of the expression is moved to the next line and indented. In code excerpts, a backslash (\ ) indicates that the current line continues on to the next line.

1

Getting Started with Virtuoso Concurrent Layout

Virtuoso® Concurrent Layout (CLE *with E for editing*) is a layout editing environment that enables designers to work concurrently on the same cellview within Virtuoso. This helps them in parallelizing their efforts, and, in turn, increases the productivity of the layout design team. You can perform concurrent editing in Layout XL and Layout EXL.

This section covers the following topics:

- Concurrent Layout Terminology
- Benefits of Using Concurrent Layout
- Concurrent Layout Flow
- Limitations
- Accessing Concurrent Layout

Concurrent Layout Terminology

Listed below are some important Concurrent Layout terms you need to know before you start using the software:

Top Cellview/Top Design

This is the initial layout cellview to be concurrently edited after initialization. After opening in memory it is called the top design.

Design Partition

A design partition divides the design responsibilities among designers. You can create as many partitions as needed in a design and new design partitions can be created at any time.

The different types of design partitions are the following:

- **Area-based design partition**
  Defines one or more areas for a designer to edit within.
- **Net-based design partition**
  Defines a net set for a designer to edit only those objects that have allowed or no connectivity.
- **Object-based design partition**
  Defines the object ownership for a designer to edit. The person who created the object also owns it.
- **Free design partition**
  Allows the user to work on any object, net, and any part of the design.

Design Partition View

The on-disk layout cellview that stores incremental edits to the top design separately. These updates can be reapplied to the same top design later.

Design Manager

Defines the design partition for each designer and merges the respective design partition views back to the top design.

Designer

A user who edits in the assigned design partition.

Peer Designer

A designer working on another design partition of the same top design concurrently. Updates made by the peer designer are saved to a different design partition view.

Benefits of Using Concurrent Layout

Some of the top benefits on using Concurrent Layout are the following:

- Boosts layout productivity by enabling several designers to work concurrently on the same cellview. Typical examples are DRC fixing, chip finishing, and critical nets manual routing.
- Saves the design partition view containing only the updated part of the design, which is quite small in comparison to the initial cellview. This reduces the disk access time. In the design

management environment, this saves vault storage space and reduces the network traffic to improve the network responsiveness.

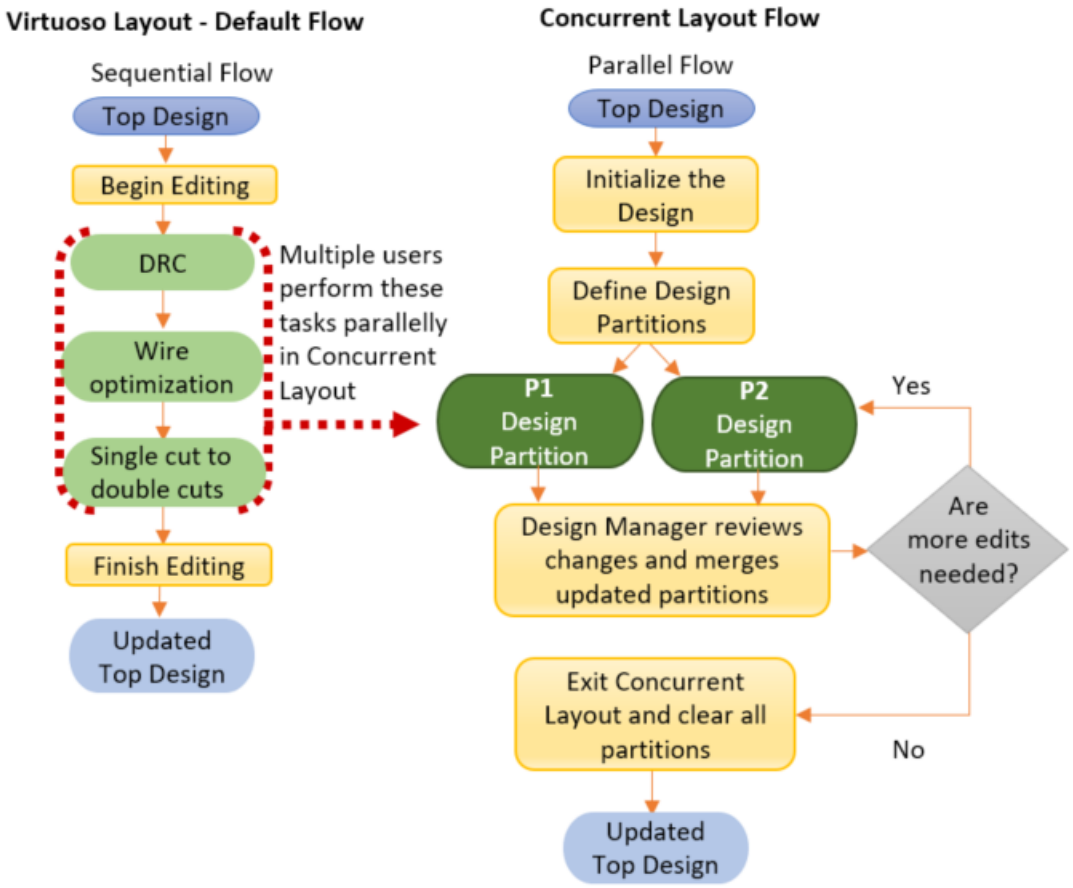
- Enables the design manager to review a partition view and merge or reject it. The user can generate several results for what-if analysis and picks the best combination in the end.
- Supports off-line concurrent editing because the client/server model can suffer synchronization bottleneck over the network.
- Provides Incremental Edit In Place to complement the traditional hierarchical design by postponing an update in the sub-hierarchy until it is verified in all the designs referencing it.

Concurrent Layout Flow

The default Virtuoso Layout flow is sequential in which each task is carried out after the previous task is complete. However, in the CLE environment, you can create multiple partitions in the design and have designers work in parallel, which helps save time. The basic Concurrent Layout flow, involves the following tasks:

1. Open the top design. (Design Manager)
2. Initialize the design for concurrent layout editing. (Design Manager)
3. Define design partitions based on how you want to divide the work among various designers. (Design Manager)
4. Perform various tasks such as DRC checks and wire optimization in parallel on assigned designed partitions. (Designers)
5. Save design partition updates in respective design partition views and submit the updates for merge with the top design. (Designers)
6. Review and merge design partitions. (Design Manager)
7. Repeat steps four to six as needed. A merged design partition is auto reset in memory when it is reopened. (Designers)
8. Exit the CLE environment and clear all design partitions. (Design Manager)
9. Open the updated top cellview in Virtuoso Layout. (Design Manager)

The following flow chart shows the difference between the default Virtuoso Layout flow and the Concurrent Layout flow.



Limitations

Listed below are some tasks that are currently not supported in Concurrent Layout editing:

- Constraint editing. For example, you cannot edit MODGENs in Concurrent Layout.
- Editing an object created in an imported peer partition. Edits made to this object are not saved. You can only concurrently edit an object existing in the top design.

When a limitation is detected, Concurrent Layout displays an alert glyph on the canvas and an *Edit Loss* error in the *Alerts* section of the *Concurrent Layout* assistant. You will be asked to undo the changes because saving them can result in a partially saved design, where the unsupported changes will be lost.

In case of constraint editing, if you proceed with saving the design, Concurrent Layout may create a marker to record the incident and inform the design manager that an unsupported edit was not undone by the designer before save.

You might see other kinds of alerts, such as edit conflicts that can result in merge issues. For example, a complex object, such as an MPP being edited in two design partitions can cause edit conflicts. Such issues can be avoided by carefully creating the design partitions and are not considered a limitation.

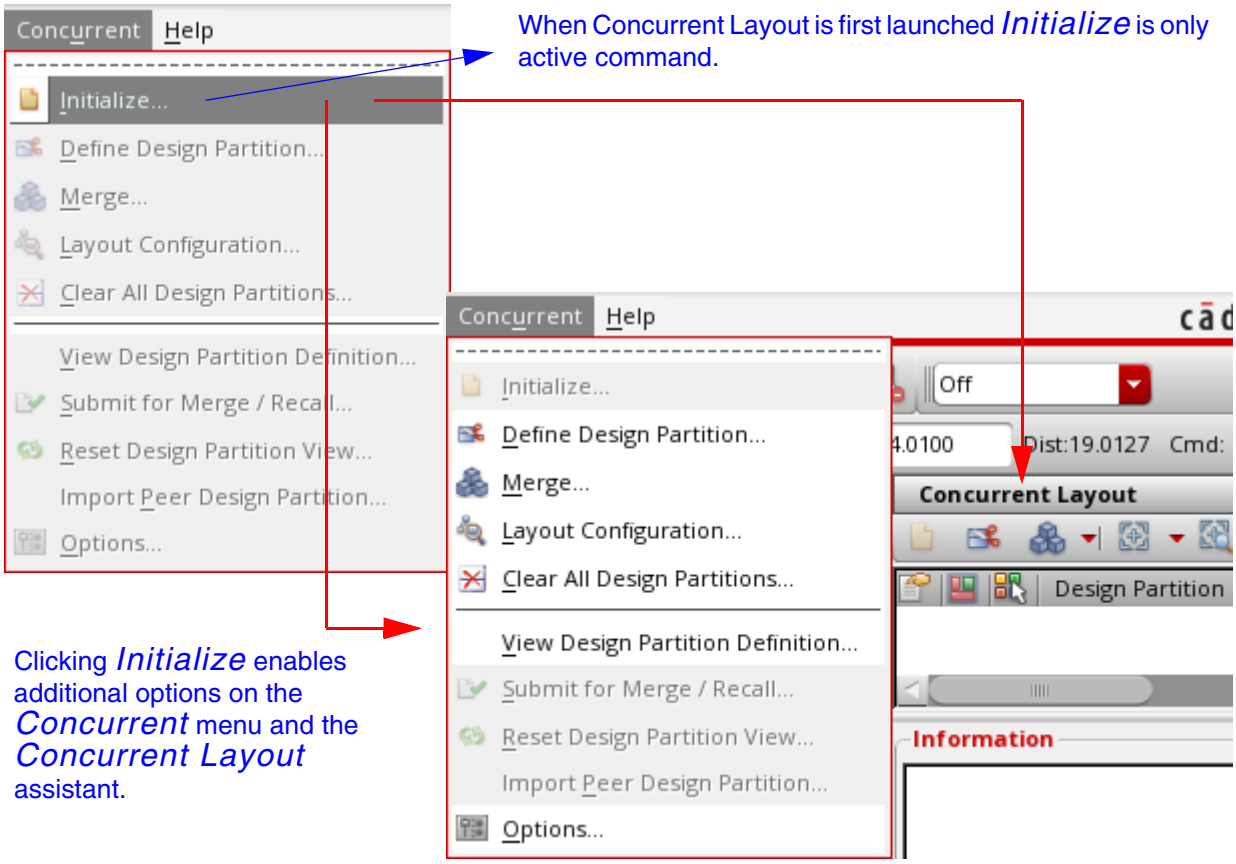
Accessing Concurrent Layout

You can access Concurrent Layout in Layout XL and Layout EXL either from the *Concurrent* menu in the menu bar or using the *Concurrent Layout* workspace:

- *Concurrent* menu

  The *Concurrent* menu provides flow-related commands for Concurrent Layout.

  To get the design ready for concurrent editing, click the *Initialize* command on the *Concurrent* menu. This displays additional commands in the *Concurrent* menu and also embeds the Concurrent Layout assistant as a docked assistant pane within the current session window.



  The commands that are enabled in the *Concurrent* menu depend on the mode in which the design is open. These modes are the following:

  - **Manager mode**
    Lets you perform various managerial tasks, such as defining the design partition for

each designer and merging the respective design partition views back to the top design.

- **Designer mode**
  Lets you edit the design in the assigned design partition view and then submit these changes for merging with the top design.

The manager mode and designer mode commands in the *Concurrent* menu are described below.

Command	Function	Mode
Initialize	Initializes the design for concurrent editing.	Pre-Initialization
Define Design Partition	Displays the Define Design Partition form that lets you create and configure design partitions.	Manager
Merge	Displays the Merge form that lets you merge or reject design partition views that have been submitted to be merged with the top design.	Manager
Layout Configuration	Displays the Layout Configuration form that lets you load or unload layout configurations in design partition views.	Manager and Designer
Clear All Design Partitions	Displays the Clear All Design Partitions form that lets you remove the existing design partition views from the top design so that the design can be edited without using Concurrent Layout.	Manager
View Design Partition Definitions	Displays the View Design Partition form that lets you check design partition definitions.	Manager and Designer
Submit for Merge / Recall	Submits the updated design partition view for merge. If you have submitted a design for merge, then you can use this command to recall the design and change the design status to *Editing*.	Designer

Command	Function	Mode
Reset Design Partition View	Clears all the edits in the design partition view. The status changes to either *Created* or *Reset* (if this design partition view was merged before). If the design partition status is *Error*, see the tooltips for the reason and you could fix it by resetting.	Designer
Import Peer Design Partition	Displays the Import Peer Design Partition form that lets you import updates made by a peer designer in your Design Partition view.	Designer
Options	Displays the Concurrent Layout Options form.	Manager and Designer

- Concurrent Layout workspace

  The workspace for Concurrent Layout is called *Concurrent_Layout*. To apply the Concurrent Layout workspace, do one of the following in the Layout XL or Layout EXL window:

  - Select *Window – Workspaces – Concurrent_Layout*.
  - Select *Concurrent_Layout* from the drop-down list on the *Workspace Configuration* toolbar.

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The Concurrent Layout Assistant

The *Concurrent Layout* assistant is a dockable/undockable assistant pane that provides various options that enable you to perform tasks related to concurrent layout editing. The assistant also displays alerts and other information about the design partition you are updating.

This section covers the following topics:

Accessing the Concurrent Layout Assistant

To access the Concurrent Layout assistant in Layout XL, do one of the following:

- In the Layout XL window, select the *Concurrent* menu and choose *Initialize*.
- In the Layout XL window. select *Window – Assistants* – Concurrent Layout.
- Right-click the main Layout XL menu or toolbar area and select *Concurrent Layout*.
- Apply the Concurrent Layout workspace. To do this, select *Window – Workspaces – Concurrent_Layout*.
- Select *Concurrent_Layout* from the drop-down combo box on the Workspaces toolbar.

Once the Concurrent Layout is selected, Layout XL embeds the *Concurrent Layout* assistant as a docked assistant pane within the current session window. By default, the *Concurrent Layout* assistant is positioned on the right side of the session window.

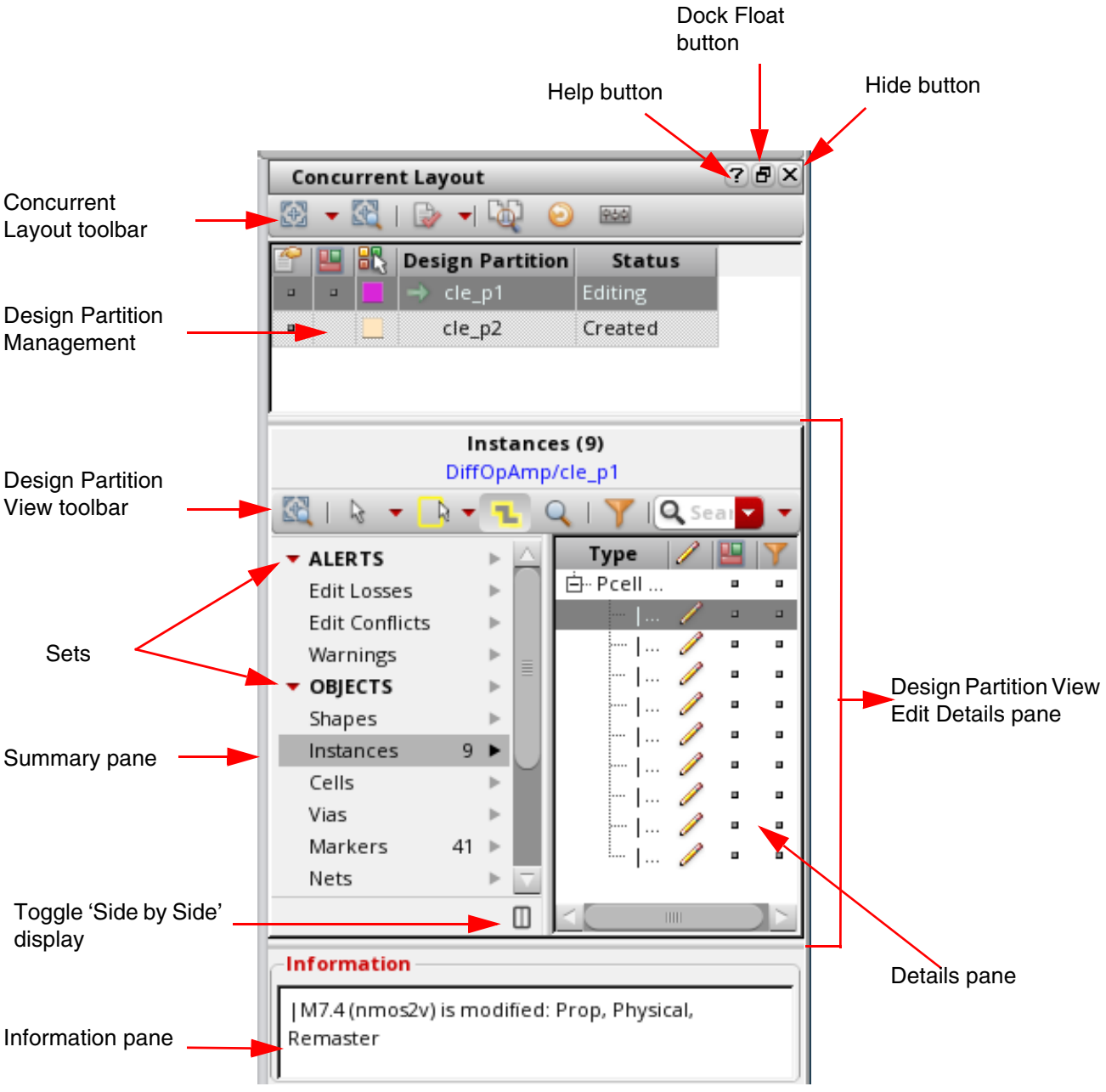
Hiding the Concurrent Layout Assistant

To hide the Concurrent Layout assistant in the current session window, do one of the following:

- In the Layout XL window, open *Window – Assistants* and then deselect *Concurrent Layout*.
- Right-click in the Layout XL menu or toolbar area and deselect the Concurrent Layout option.
- Change to a workspace configuration that does not include the Concurrent Layout as part of its default configuration.
- Click the Hide button in the Concurrent Layout assistant pane title bar.

Concurrent Layout Assistant User Interface

The following screenshot shows different toolbars and panes in the Concurrent Layout assistant.



Options in the Concurrent Layout assistant depend on the mode in which the design is open. These modes are:

- **Manager mode**
  Perform various managerial tasks, such as defining the design partition for each designer and merging the respective design partition views back to the top design.
- **Designer mode**
  Edit the design in the assigned design partition view and then submit these changes for merging with the top design.

The manager mode and designer mode options in the *Concurrent Layout* assistant are described below.

Concurrent Layout Assistant in Manager Mode

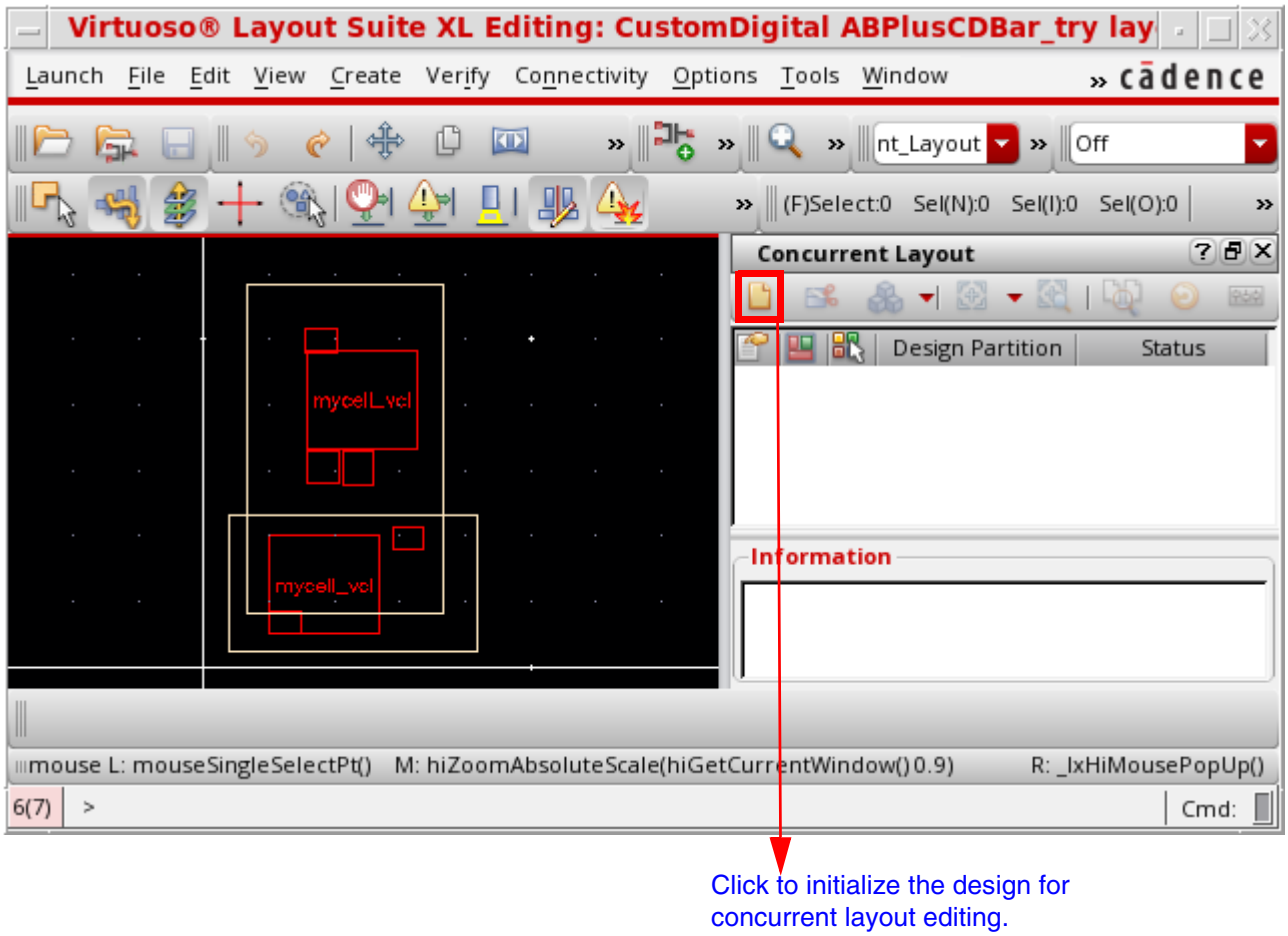
This section discusses the following manager mode Concurrent Layout options.

- Manager Mode: Concurrent Layout Toolbar
- Manager Mode: Design Partition Management Pane
- Manager Mode: Preview Options
- Manager Mode: Display Additional Columns
- Manager Mode: Design Partition Options

Manager Mode: Concurrent Layout Toolbar

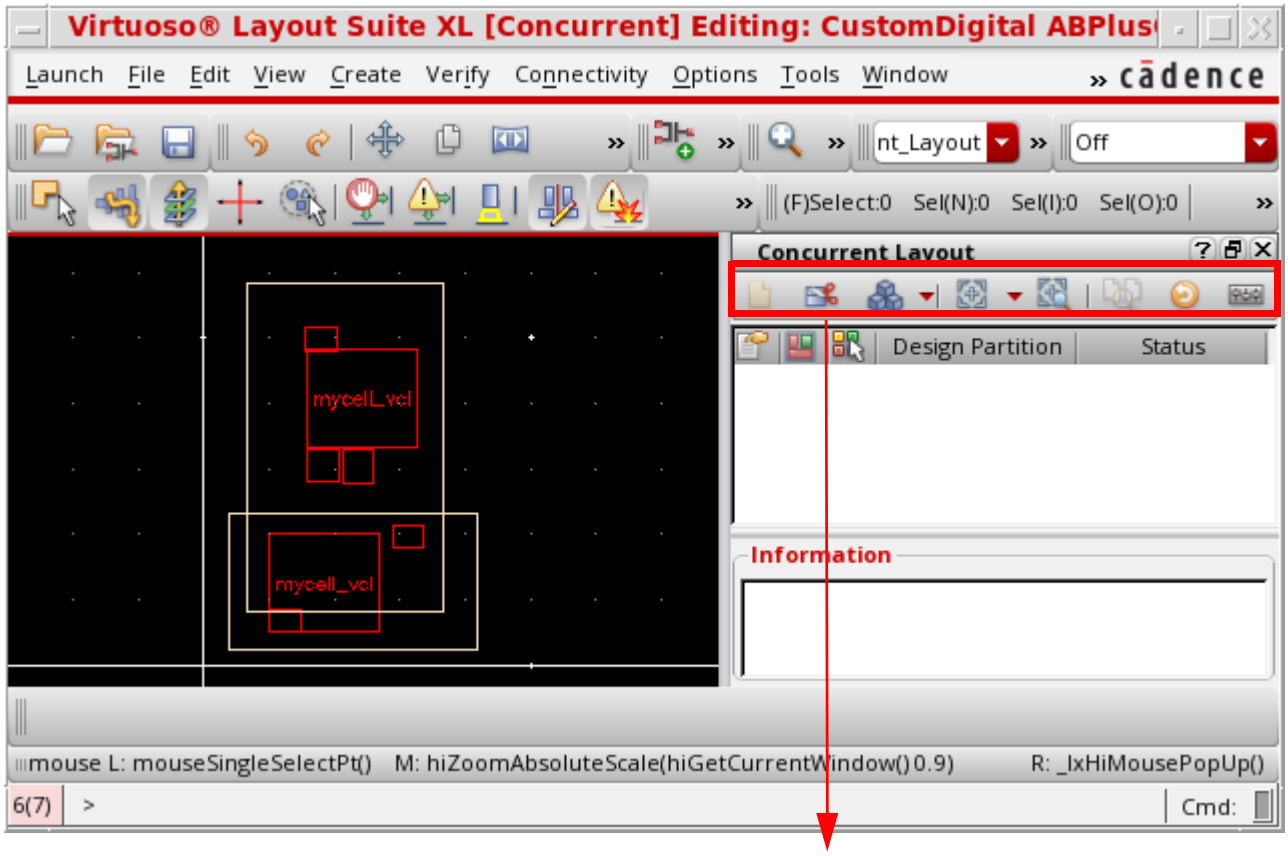
To perform concurrent layout editing, you first need to initialize the design to make it ready for concurrent editing. Therefore, when you start the Concurrent Layout assistant for the first time for a design, only the *Initialize* button is available on the Concurrent Layout toolbar.

Click *Initialize* to make the design ready for the concurrent editing. This annotates the design so that it opens in the Concurrent Layout environment next time.



Note: This step cannot be undone and will disable *Connectivity - Generate All From Source.* If needed, use this command before you initialize the cellview for Concurrent Layout editing.

After you initialize the design, remaining buttons on the Concurrent Layout toolbar are enabled in manager mode.



After the design is initialized, other manager mode options become enabled on the toolbar.

The following table lists the functions of the different options on the Concurrent Layout assistant toolbar:

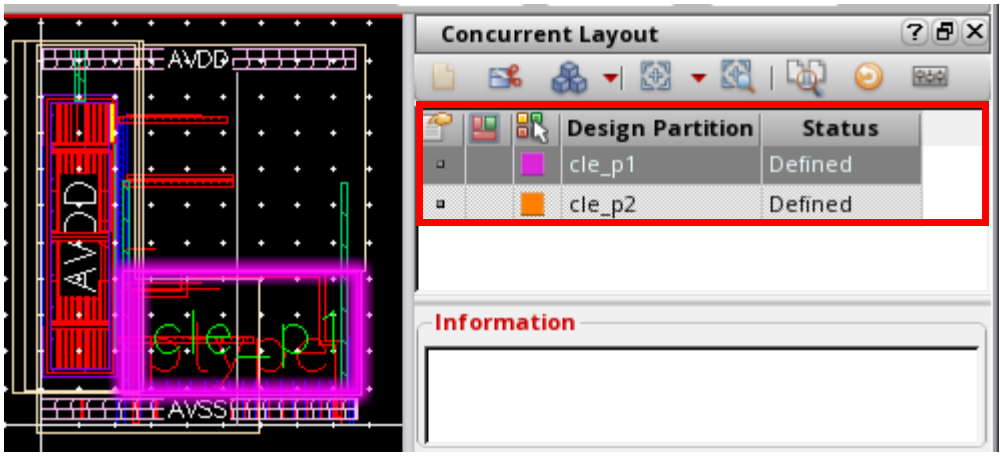
Icon	Command	Function
	*Initialize*	Initializes the design for concurrent editing.
	*Define Design Partition*	Displays the Define Design Partition form that lets you create and configure design partitions.

Icon	Command	Function
	Merge/Un-Merge	Displays the Merge form that lets you merge or reject design partition views that have been submitted to be merged with the top design.
	*Close Design Partitions*	Cancels checkout of design partition views. This should be the last step of merge after the top design is checked-in. *Important* This option is available only in the design management environment.
	Commit (Save)	Saves the merged partition to the top design.
	Change Design Partition View	Displays the Change Design Partition View form that lets you change existing design partition views.
	Layout Configuration	Displays the Layout Configuration form that lets you load or unload layout configurations in design partition views.
	Append History	Displays the Append History form that lets managers inform designers about important changes made to the top design.
	Clear All Design Partitions	Clears all design partitions defined for the cellview. **Note:** Concurrent editing can be done only in compatible advanced nodes version, such as ICADVM18.1 or later. If you want to open your design in a mature node version, such as IC6.1.8, first use the *Clear All Design Partitions* command to clear all design partitions and save the design. You can now open this design in a compatible mature node version of Virtuoso.
	*Auto Zoom*	Toggles zoom to selected object.
	*Auto zoom mode and scale*	Sets *Fixed* or *Minimal* scale for auto zoom.

Icon	Command	Function
	*Zoom To Selected Partition*	Zooms to the selected or the current design partition.
	*Synchronized Preview*	Compares design before and after you update it by placing them side-by-side.
	*Refresh Data From Disk*	Reloads design partition views or the top design from the disk.
	*Options*	Displays the Concurrent Layout Options form.

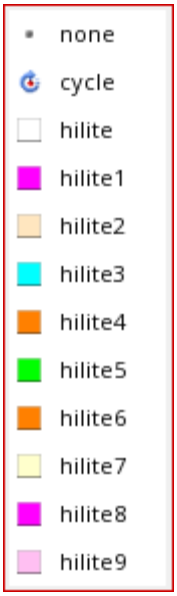
Manager Mode: Design Partition Management Pane

The Design Partition Management pane shows the information regarding the design partitions that have been created in the top design.



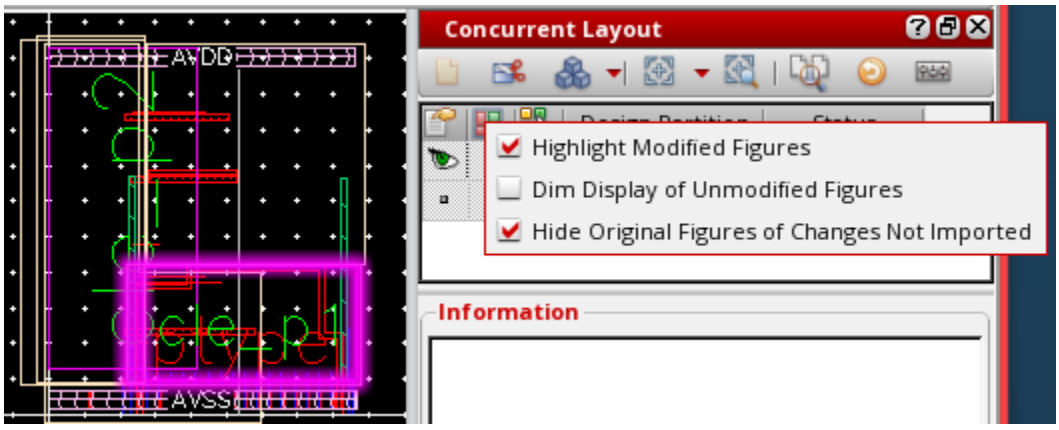
The following table lists the functions of the different options on the title bar of the Design Management pane:

Icon	Command	Function
	*Partition Definition State*	Shows and sets the definition state to highlight the area boundary of the design partition or the bounding box of the figure group of the partition. Click the column header to change the state for all design partitions. Ctrl + Click on this option to sort the partitions by definition states.
	*Preview*	Shows and sets the preview state to see the partition changes in the foreground cellview. Click the column header to change the state for all design partitions. Ctrl + Click on this option to sort design partitions by preview states. Right-click to view preview options. For more information, see Designer Mode: Preview Options.

Icon	Command	Function
	*Preview Highlight Color*	Specifies the color to highlight the selected design partition or individual changes in the canvas. 
	*State*	Displayed if partition definition state or preview is enabled.

Manager Mode: Preview Options

Additional preview options are displayed when you right-click the *Preview* option on the title bar of the Design Management pane.

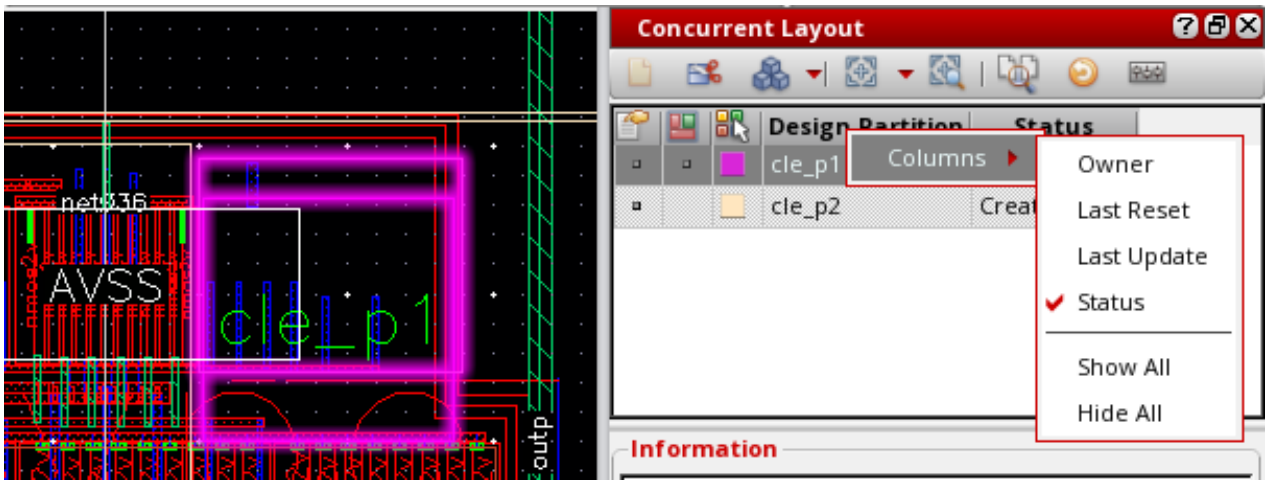


The following table lists the functions of commands on the right-click menu of the *Preview* option:

Command	Function
Highlight Modified Figures	Highlights the updated figures in the selected design partition. Default value: Selected
Dim Display of Unmodified Figures	Dims the color of figures that have not been modified. Default value: Deselected
Hide Original Figures of Changes Not Imported	Hides the figures for which changes have not been imported. Default value: Selected

Manager Mode: Display Additional Columns

When you right-click on the table header of the Design Partition Management pane, you will see a few options that allow you to display additional columns in this table.



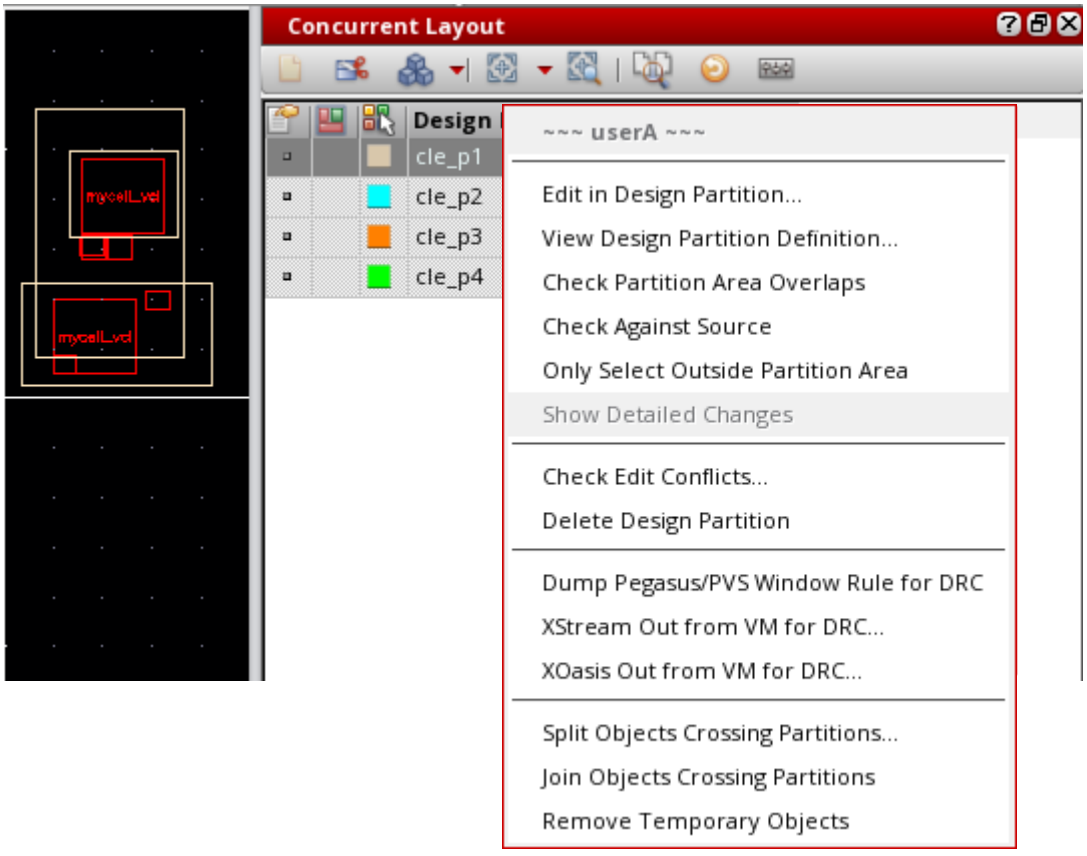
These columns are:

Command	Function
Owner	Displays the owner of each design partition.
Last Reset	Shows when the partitions were reset the last time.
Last Update	Show when the partitions were updated the last time.

Command	Function
Status (selected by default)	Shows the status of each design partition. Valid values: Created, Editing, Submitted, Merged, Defined, Reset, and Rejected
Show All	Shows all columns.
Hide All	Hides all columns.

Manager Mode: Design Partition Options

The following options are displayed when you right-click on the selected design partition in the Design Partition Management pane in manager mode:



Command	Function
Edit in Design Partition	Displays the Edit in Design Partition form that lets you edit in a selected design partition view.

Command	Function
View Design Partition Definitions	Displays the View Design Partition form that lets you check design partition definitions.
Check Partition Area Overlaps	Checks for area overlaps in partitions and creates markers for any overlaps found. Messages are displayed in CIW to provide further information about the overlaps.
Check Against Source	Runs the Layout XL command *Check Against Source* for all instances in the current design partition.
Only Select Outside Partition Area	Toggles whether manager should be allowed to edit objects in a design partition after it is created and saved.
Show Detailed Changes	Highlights the updated information in the design.
Check Edit Conflicts	Displays the Check Edit Conflicts form that lets you conduct a more thorough checking among the selected design partitions for identifying issues prior to merge.
Delete Design Partition	Deletes the selected design partition. This option deletes the selected design partition and all associated design partition views in the hierarchy. When you select this option, a message is displayed to confirm the deletion of listed top and hierarchical design partition views. An indicator (*) is used to identify the design partition views with unmerged changes. Changes in these design partition views are lost if you continue to delete the design partition.
Dump Pegasus/PVS Window Rule for DRC	Restricts the batch Pegasus or PVS window rule file to check only within the design partition area.
XStream Out from VM for DRC	Translates the current design partition view to a stream file from virtual memory for running DRC checks.
XOasis Out from VM for DRC	Translates the current design partition view to an OASIS file from virtual memory for running DRC checks.

Command	Function
Split Object Crossing Partitions	Displays the Split Crossing Objects Options form that lets you specify how to split the objects that are part of multiple partitions.
Join Objects Crossing Partitions	Joins all objects that were split by the Split Crossing Objects Options command.
Remove Temporary Objects	Deletes temporary objects, such as virtual pins created by Virtuoso Space-based Router (VSR) for routing inside area boundaries of the design partition.

Concurrent Layout Assistant in Designer Mode

This section discusses the Concurrent Layout options available in designer mode.

Options in designer mode are available when you are editing a design partition view. You can either directly open a design partition view for editing, or in manager mode right-click on a design partition view in the Design Partition Management pane and choose *Edit in Design Partition*.

- Designer Mode: Concurrent Layout Toolbar
- Designer Mode: Preview Options
- Designer Mode: Display Additional Columns
- Designer Mode: Design Partition Options
- Designer Mode: Design Partition View Contents Section

Designer Mode: Concurrent Layout Toolbar

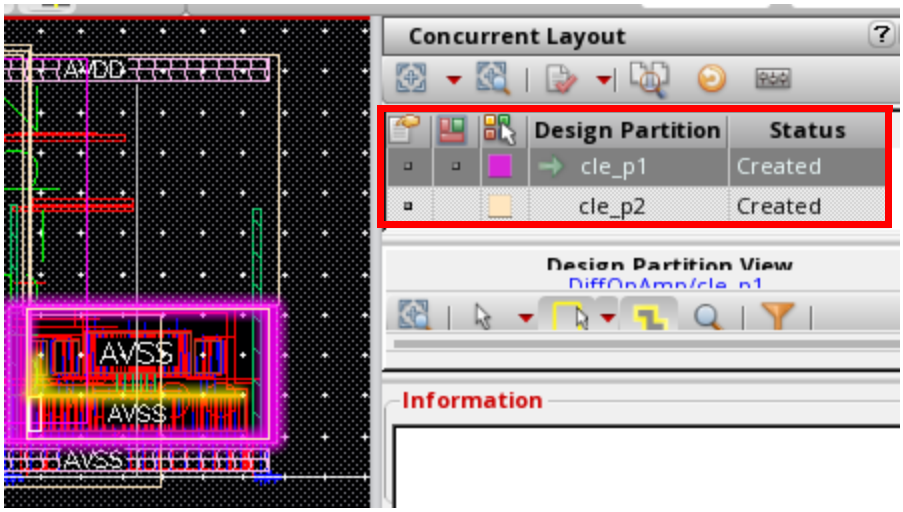
The following table lists the functions of the different options on the Concurrent Layout assistant toolbar in designer mode:

Icon	Command	Function
	*Auto Zoom*	Toggles zoom to selected object.
	*Auto zoom mode and scale*	Sets *Fixed* or Minimal scale for auto zoom.
	*Zoom To Selected Partition*	Zooms to the selected or the current design partition.
	Submit for Merge	Submits the updated design partition view for merge. If you have submitted a design for merge, then you can use this command to recall the design and change the design status to Editing.

Icon	Command	Function
	Recall	Lets you recall a design submitted for merge. This changes the status of the design to *Not Submitted*.
	Reset Design Partition View	Clears all the edits in the design partition view. The status changes to either Created or Reset (if this design partition view was merged before). If the design partition status is Error, see the tooltips for the reason and you could fix it by resetting.
	Layout Configuration	Displays the Layout Configuration form that lets you load or unload layout configurations in design partition views.
	View History	Displays the View History form that lets you check information about important changes made to the top design.
	Save As Full Partition View	Displays the Save As Full Partition View form that lets you save the full design partition view of the specified cellview.
	*Synchronized Preview*	Compares the design before and after you update it by placing them side-by-side.
	*Refresh Data From Disk*	Reloads design partition views or the top design from the disk.
	*Options*	Displays the Concurrent Layout Options form.

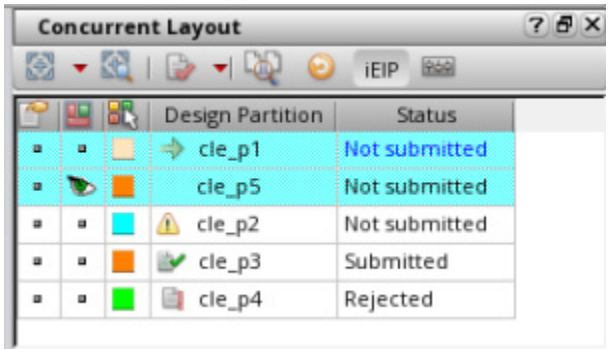
Designer Mode: Design Partition Management Pane

The Design Partition Management pane shows the information regarding the design partitions that have been created in the top design.



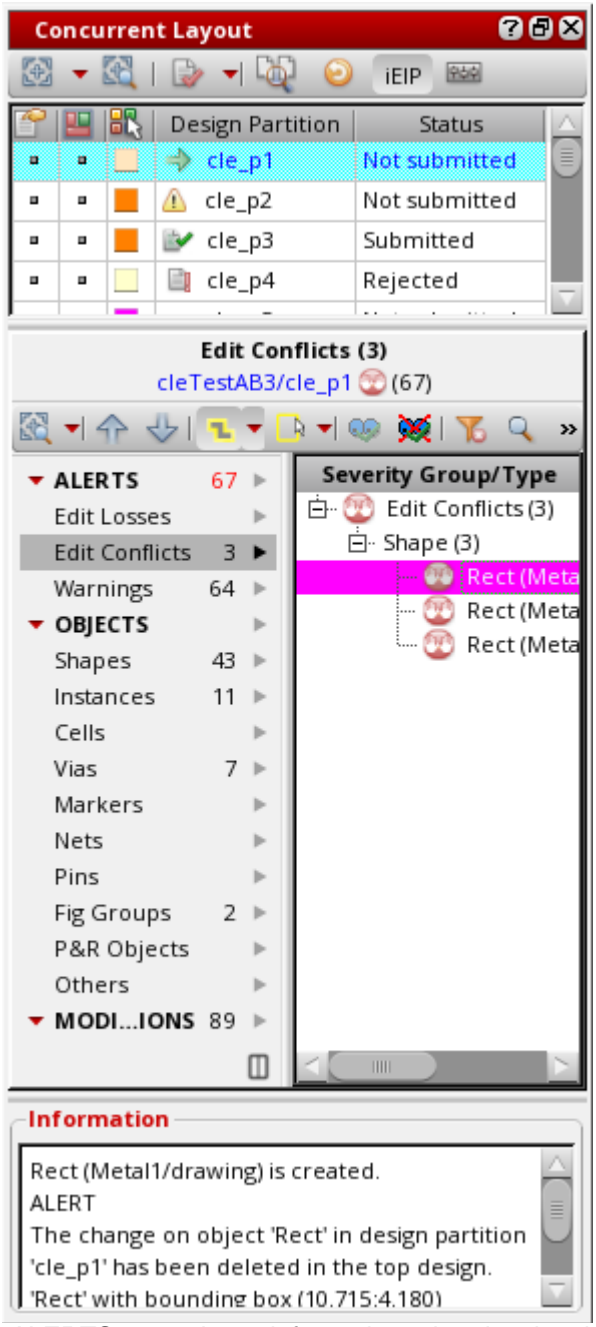
The functions of options on the title bar of the Design Partition Management pane are the same as manager mode. See Manager Mode: Design Partition Management Pane.

The following table describes the meaning of different colors and icons in the Design Partition Management pane.



	Description	Available in
	Row with blue background and blue font in the *Status* column implies that this design partition is being edited.	Designer mode only
	Row with blue background and black font in the *Status* column implies that this design partition was imported.	Designer mode only

	Description	Available in
	Details for the design partition marked with a green arrow are being displayed in the ALERTS and Information panes, as shown below:	Both Manager and Designer modes



ALERTS pane shows information related to the cle_p1 partition which is marked with a green arrow in the Design Partition Management pane.

	Description	Available in
	Design partition marked with the exclamation mark icon implies that it is invading the current design partition.	Designer mode only
	Design partition marked with green check mark icon implies that this design partition was submitted for merge.	Both Manager and Designer modes
	Design partition marked with the document with exclamation mark icon implies that this design partition was rejected.	Both Manager and Designer modes

Designer Mode: Preview Options

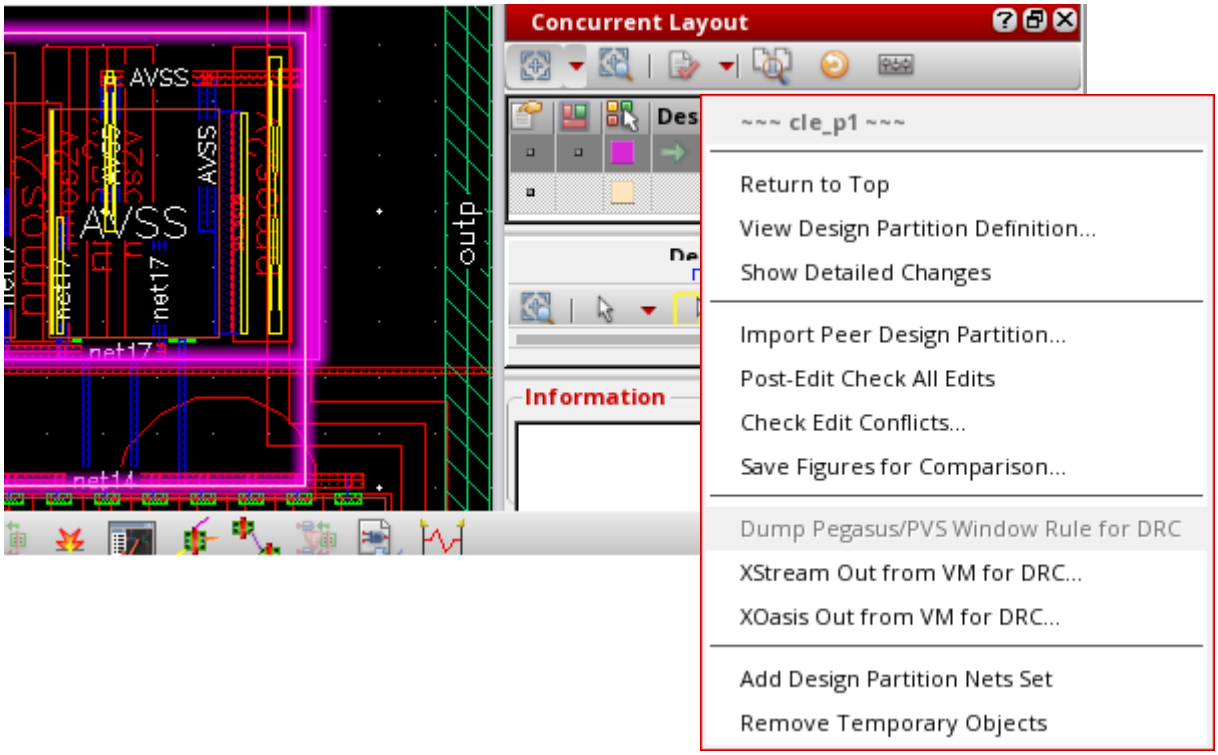
These options are the same as manager mode. See Manager Mode: Preview Options.

Designer Mode: Display Additional Columns

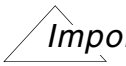
These options are the same as manager mode. See Manager Mode: Display Additional Columns.

Designer Mode: Design Partition Options

The following design partition options are available:



Command	Function
Return to Top	Saves the edits made and returns to the top design. This option is available after you choose *Edit in Design Partition* from the top design.
View Design Partition Definition	Displays the View Design Partition form that lets you check design partition definitions.

Command	Function
Return to Design Partition	Returns to edit in the figure group of an object-based design partition. The option is available when you return from the figure group of the design partition to the top level. **Note:** You can also click on the blue Alert icon to return.  *Important* This option is available only for object-based design partitions.
Show Detailed Changes	Highlights the updated information in the design.
Import Peer Design Partition	Displays the Import Peer Design Partition form that lets you import updates made by a peer designer in your Design Partition view.
Post-Edit Check All Edits	Touches all changed objects to allow the interactive checkers, such as post-edit DRD or connectivity extraction, to verify these edits. **Note:** This option is not available after you have imported peer partitions.
Check Edit Conflicts	Displays the Check Edit Conflicts form that lets you view a log file that lists any edit conflicts that might have occurred due to changes made in the selected design partition.
Save Figures for Comparison	Displays the Save Figures for Comparison form that lets you specify the views that you want to save and compare the updates made.
Dump Pegasus/PVS Window Rule for DRC	Generates the window rule file to restrict the batch Pegasus or PVS to check only within the design partition area.
XStream Out from VM for DRC	Translates the current design partition view to a stream file from virtual memory for running DRC checks.
XOasis Out from VM for DRC	Translates the current design partition view to an OASIS file from virtual memory for running DRC checks.

Command	Function
Add Design Partition Nets Set	Switches to the Navigator assistant and displays the list of nets crossing or inside the current design partition under the *CONCURRENT LAYOUT* category.
Remove Temporary Objects	Deletes temporary objects, such as virtual pins created by Virtuoso Space-based Router (VSR) for routing inside area boundaries of the design partition.

Designer Mode: Design Partition View Contents Section

The Design Partition View Contents section becomes available when you are editing a design partition view.

This section comprises three main components:

- Design Partition View Toolbar
- Summary Pane
- Details Pane
- Information Pane

Each of these components is described in detail below.

Design Partition View Toolbar

The following table lists the functions of the different options on the Design Partition View toolbar:

Icon	Command	Function
	*Zoom to Selected*	Zooms to the selected object in the summary pane.
	Auto Zoom	Zooms automatically into selected design partition or selected changes.

Icon	Command	Function
	*Previous Node*	Lets you move to the previous entry in the Details pane.
	*Next Node*	Lets you move to the next entry in the Details pane.
	*Cross Highlight in Canvas*	Toggles the display of halo over the edited object in the canvas. When enabled, the selected objects in the Details pane are haloed in the canvas
	Select All	Selects all objects in the Details pane.
	Deselect All	Deselects all objects in the Details pane.
	Cross Select in the Canvas	Toggles the cross selection of objects in Details pane to the canvas
	*Select Inside Partition*	Toggles between *Off* and *Only Select Inside Partition* modes.

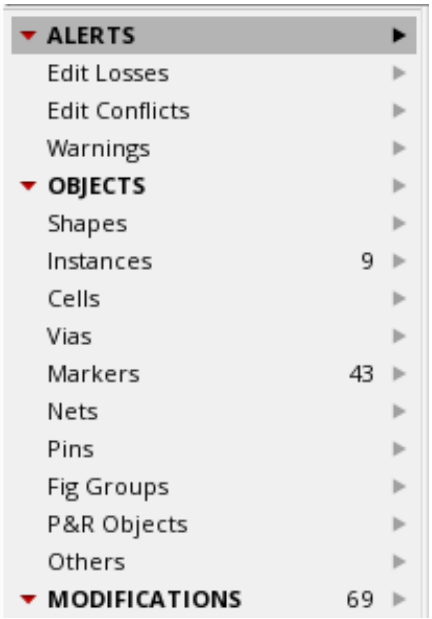
Icon	Command	Function
	*Off*	Toggles between *Off* and *Only Select Inside Partition* modes. When set to Off, there are no restrictions about creating or editing in the current design partition.
	Only Select Inside Partition	Prevents selecting objects that are fully outside the design partition. Objects that are fully or partially inside or have been temporarily moved outside the current partition for editing are also selectable. This option is selected by default.
	Only Edit Inside Partition	Lets you edit only within the current design partition. Supported commands are: *Create – Shapes*, *Create – Instance*, *Create – Pin*, *Create – Label*, *Create – Fluid Guard Ring, Create – Wiring – Wire, Create – Via, Edit – Move, Edit – Copy, Edit – Stretch, Edit – Delete, Edit – Quick Align, Edit – Advanced – Reshape*.
	Change Selection Filters on Nets	Selects only those shapes that are unassigned or assigned to a net in the selection filter on nets, or have been modified. Pcell is selectable if at least one instance terminal is unassigned or assigned to one net in the net filter. Regular instances are always selectable to enable the user to Edit In Place (EIP) or Descend Edit. For a net-based design partition, the default filter is the net set.
	*Show Signed-Off Changes*	Show hidden signed off checks in the Details pane.
	*Hide Signed-Off Changes*	Hide signed off checks in the Details pane. The Summary pane shows a number, which are in the format visible or total, if there are hidden signed-off checks.

Icon	Command	Function
	*Find Object From Canvas*	Finds an object in assistant by clicking an object in the canvas without altering the canvas selection.
	*Remove Changes from Design Partition View*	Displays the Remove Changes from Design Partition View form that lets you remove the changes for which the filter state has been set from the current design partition view. You can set the filter state of a change from the *Filter State* option in the Details Pane.
	Search	Type the search keyword to filter the result in the Details pane. Use the drop-down menu to customize your search.

Summary Pane

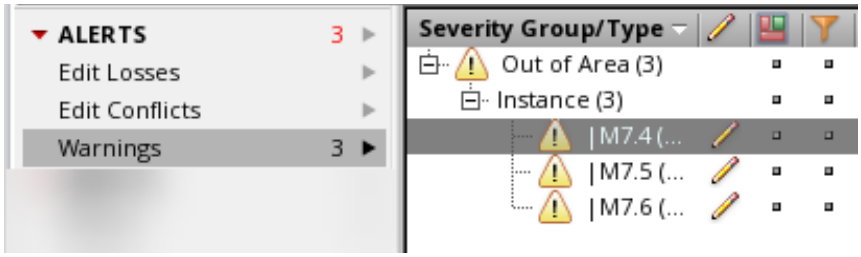
The Summary pane comprises three sections:

- ALERTS Section
- OBJECTS Section
- MODIFICATIONS Section



ALERTS Section

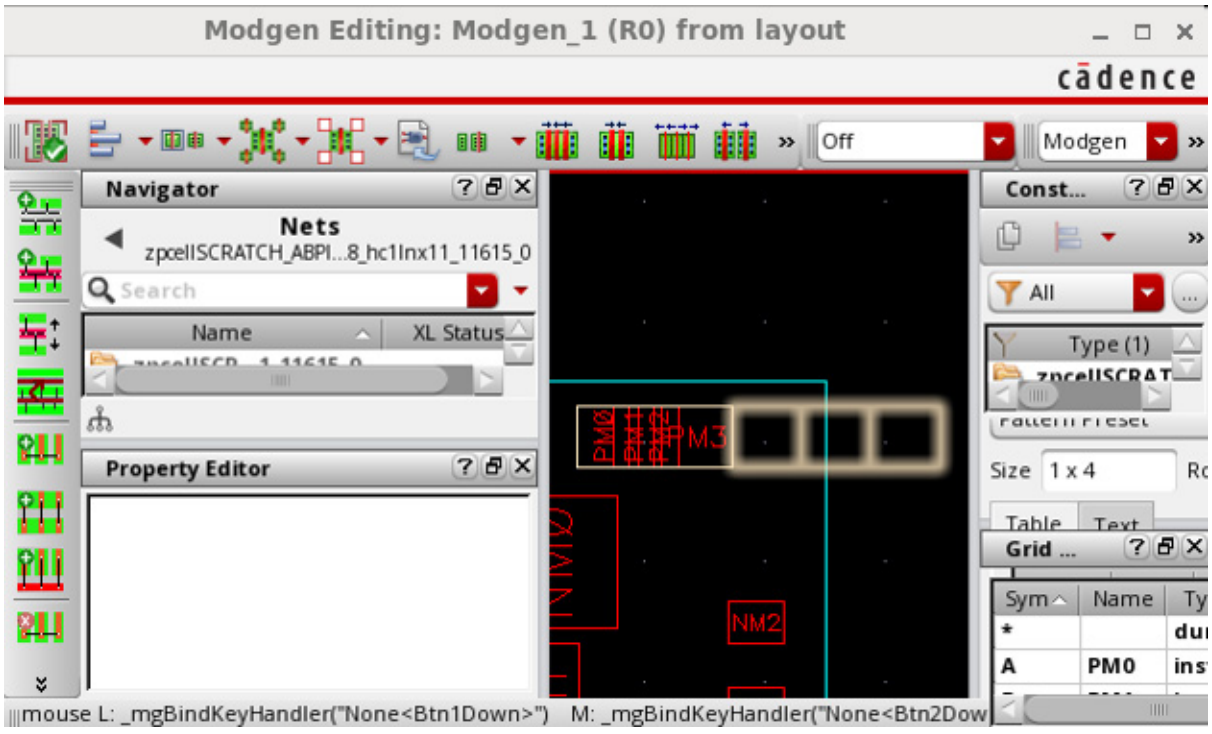
This section informs you about any issues that might arise when you edit in your design partition.



The alerts are reported under three categories:

- **Edit Losses**: Edit losses occur when you edit a constraint, such as MODGEN or an object that has been created in an imported peer partition. Warnings are displayed in the assistant and a message box displays asking you to undo the changes because they can result in edit loss.

  If you ignore the warning and save without undoing the edits, the edited object might be in an inconsistent state due to data loss. The following image shows MODGEN inconsistency due to data loss:



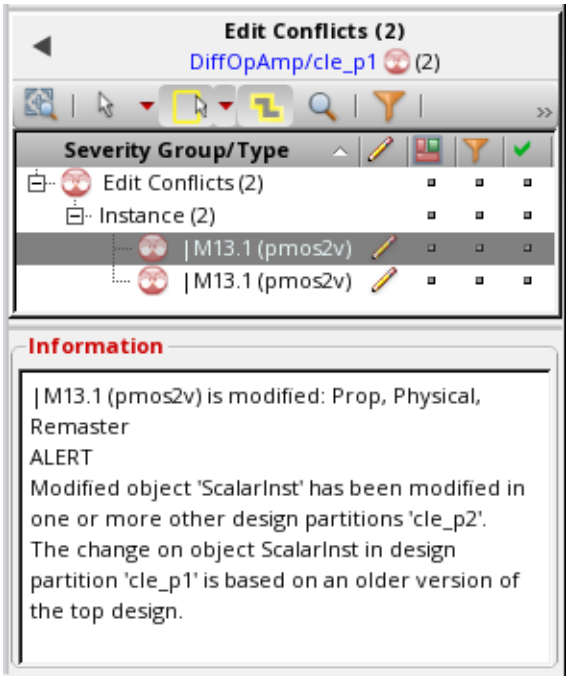
You can work around this issue by editing constraints and objects imported from peer partitions in full partition view. Although edits are lost when you create a design partition view, the geometries are retained.

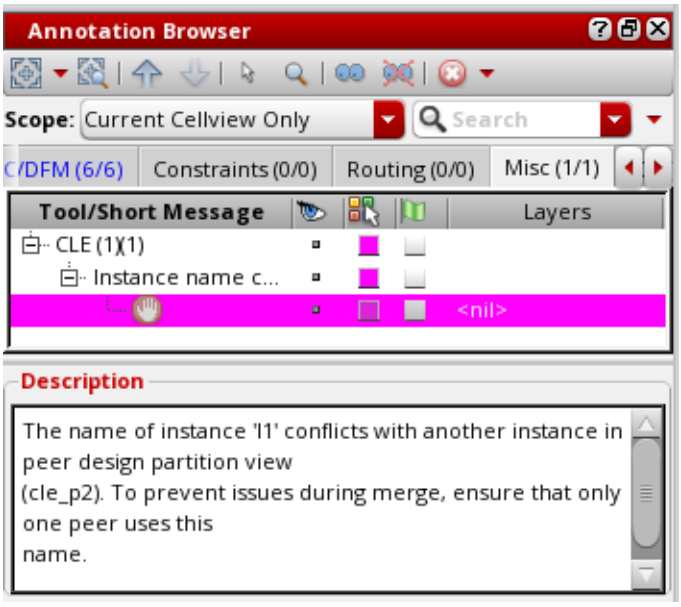
- **Edit Conflicts**: Editing in Concurrent Layout is done offline, therefore the manager or designer might edit the same object leading to the edit conflict. The assistant immediately shows an alert and cross-highlights it in canvas.

  Edit conflicts can cause issues during the merge or import process because when two changes conflict, only one can be considered and the other is lost.

  You can do the following to prevent or resolve edit conflicts:

  - Partition the design carefully and if an edit conflict is detected at runtime, undo the reported change.
  - Edit conflicts can lead to name conflicts because the two objects are given the same name. OpenAccess accepts only unique names, therefore after open, a temporary name with a marker is given to one of the conflicting objects. The user needs to manually rename it.

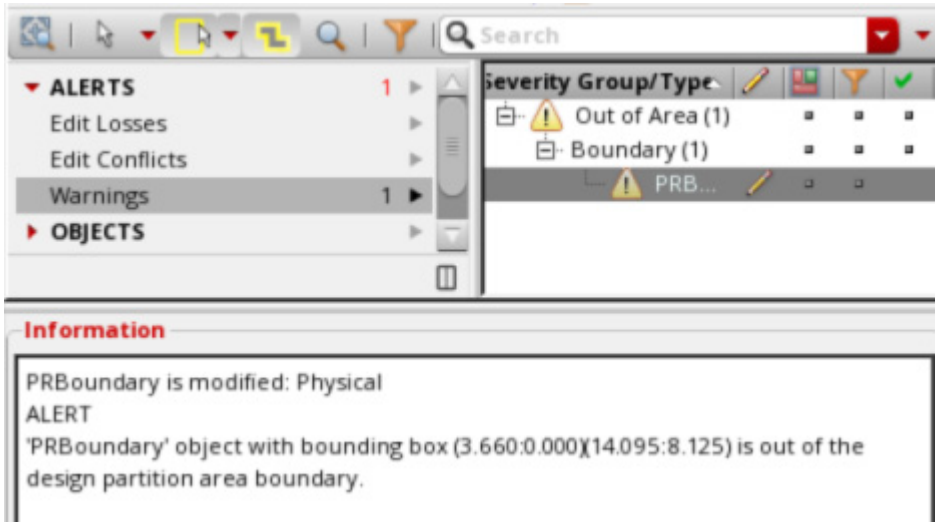




- **Warnings**: Concurrent Layout does not stop you from editing outside the current design partition. This is because most SKILL scripts and commands are not partition-aware. However, a warning is displayed to inform you that you are editing outside the partition.

It is important to avoid such edits because they can cause edit conflicts when you try to merge or import the current design partition.

A warning glyph is displayed in the canvas to show the location of the issue being reported.



Details of the warning can be viewed in the Details and Information panes of the assistant.

Warning is not displayed when:

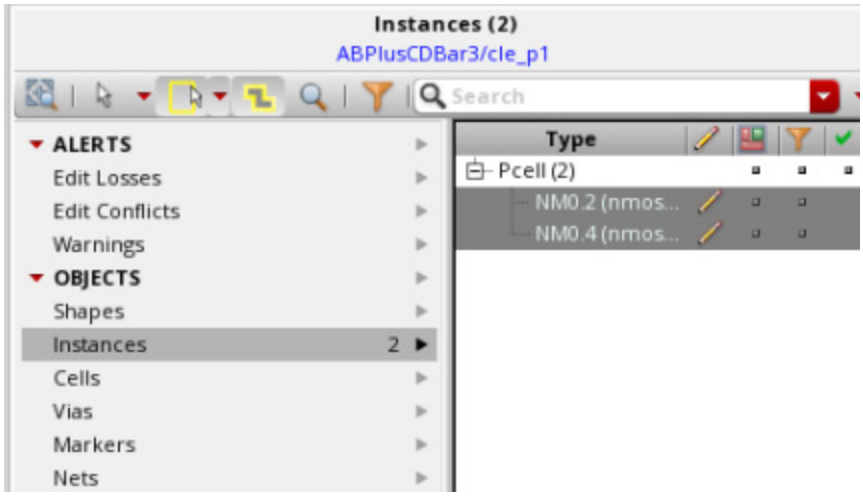
- Two partitions overlap and you are editing inside the overlap because it is still compliant.
- A partition has mixed types and all the requirements of concurrent editing are met.
- AppDef, marker, or property changes are done.

If all partitions are object-based partitions, each partition contains an exclusive object ownership for a designer to edit or delete objects. Therefore, the designer who creates an object also owns it. These objects are enclosed by a figure group and can be edited by using the edit-in-group (EIG) option.

If you do not want to remove edits for objects you do not own, select the *Filter changes for objects not owned* option in the Concurrent Layout Options form.

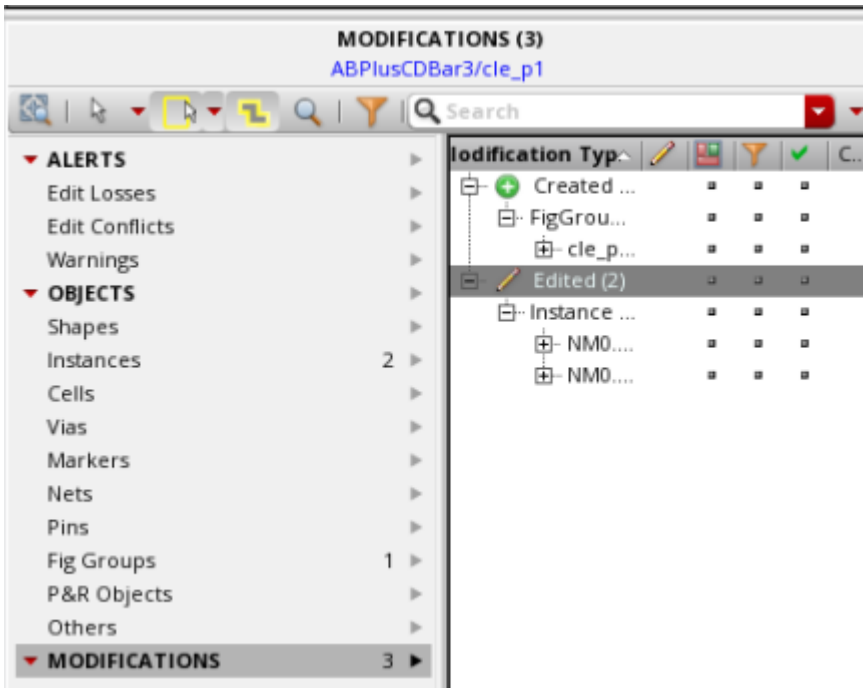
OBJECTS Section

This section lists all the objects you have updated in the selected design partition. When you select an object here, details for it are displayed in the Details Pane.



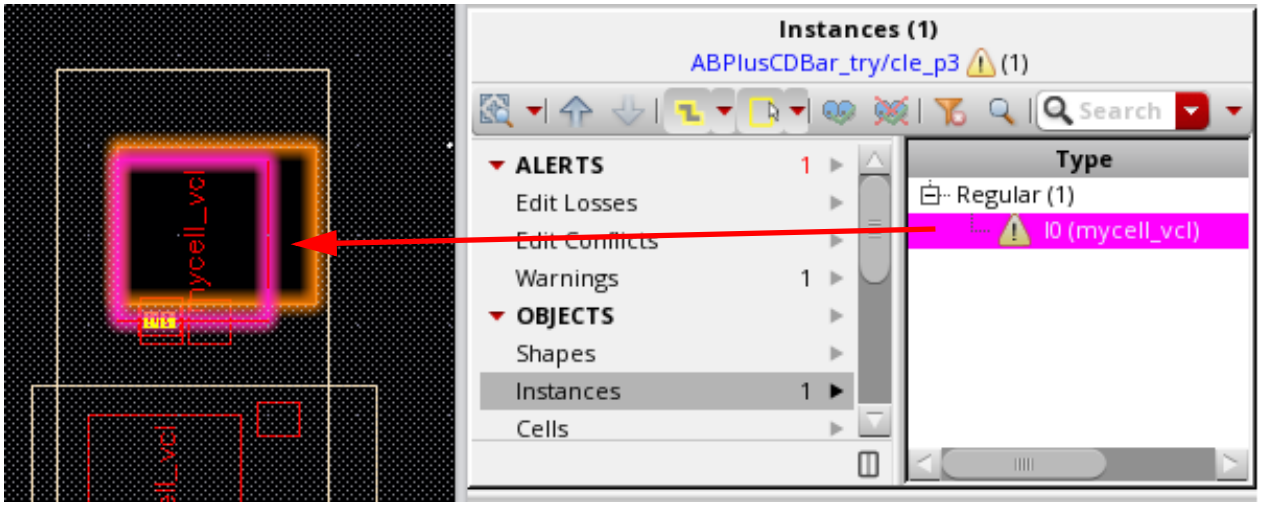
MODIFICATIONS Section

This section lists the number of updates made in the selected design partition. Unlike the OBJECTS section, one entry is added per change. Details of the updates can be checked in the Details Pane.



Details Pane

The Details pane shows the contents of the set selected in the Summary pane, and lets you navigate the changes individually. You may select an object and auto zoom to it in the canvas, or see additional information regarding the change on it.



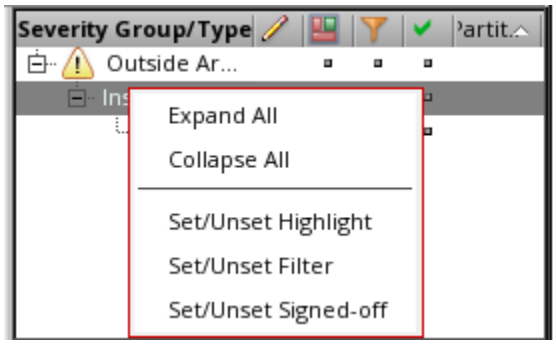
Details Pane Options

The following table lists the functions of the different options in the Details pane:

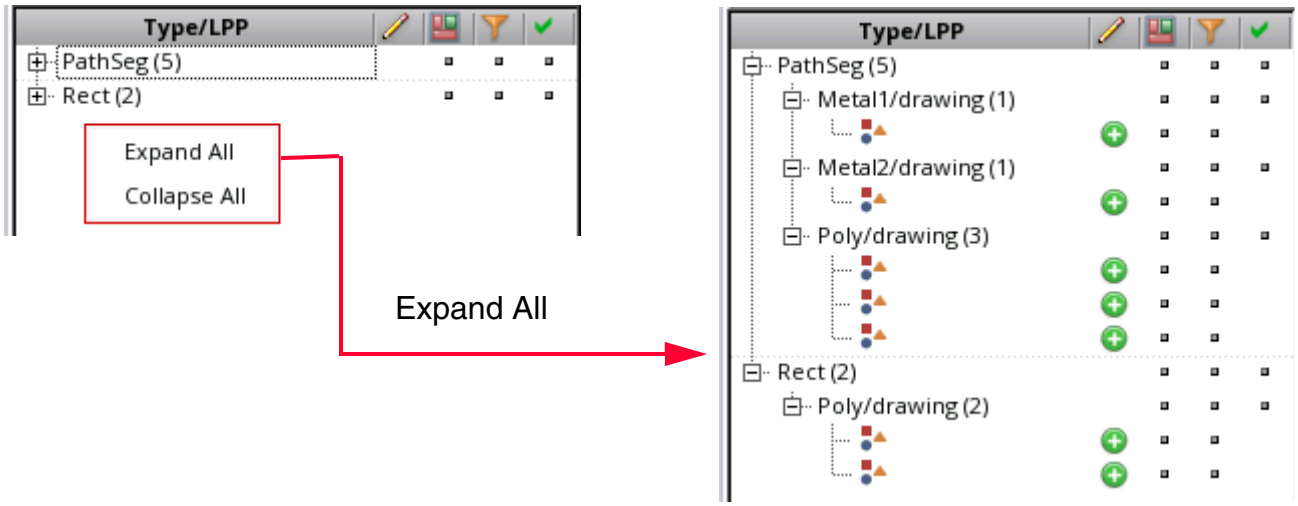
Icon	Command	Function
Type	*Type*	Displays the type of object.
	*Modification*	Shows details of the type of modification that has been done. Valid values: Created, Deleted, Edited
	*Highlight State*	Sets or unsets the highlight states. Ctrl + Click on this option to sort the design partitions by highlight states.

Icon	Command	Function
	*Filter State*	Sets or unsets the filter states. You can use the *Remove Changes from Design Partition View* command in the *Design Partition View* toolbar to remove the changes for which the filter state is set. Ctrl + Click on this option to sort design partitions by filter states.
	*Sign-off State*	Lets you sign off edit conflict alerts with the top design in red, or sign off warning/non-alert in green. You can use the *Hide Signed-off Changes* command on the D*esign Partition View* toolbar to hide the green signed-off changes in all panes. You can use the *Show Signed-off Changes* command to show them again. An alert stays until you either sign it off using this option or discard it by using the R*emove Changes from Design Partition View* command. ■ Edit loss or edit conflict with peer cannot be signed-off ■ Edit loss cannot be signed-off or removed from the design partition view. ■ All warning should be signed off all warnings to submit a design partition view for merge. ■ Ctrl + Click on this option to sort design partitions by sign-off states.
Change	*Select in Partition*	Shows the type of change that was done. This option is available only for the *Modifications* section.

Right-click on the column header of the Details pane to view options to customize its display.



Command	Function
Expand All	Expands all options listed in details pane.
Collapse All	Collapses the expanded list of options.



Command	Function
Set/Unset Highlight	Sets or unsets highlights state of selected objects.
Set/Unset Filter	Sets or unsets filter state of selected objects.
Set/Unset Signed-off	Sets or unsets signed-off state of selected objects.

Information Pane

The information pane shows additional details about the changes on a selected object. For example, if an object is moved then the change type is Physical, or if it is assigned to a net then the type is Logical. In case the change causing an alert, the additional information lets you identify the issues with your edits and then take necessary steps to resolve them.

3

Working with Concurrent Layout Editing

Introduction to Editing in Concurrent Layout Environment

This chapter discusses how you can use Concurrent Layout to perform parallel editing. From Concurrent Layout Flow you can see that tasks in Concurrent Layout are dependent on whether you are in manager mode or a designer mode. There are certain tasks such as initializing the design and defining the design partitions that can be done only in manager mode, while tasks such as editing in the design partition or resolving the conflicts can be done only in designer mode. A single user can perform tasks of both, manager, or a designer at a time. You cannot have more than one manager for the top cell on which you are performing concurrent editing. However, you can have multiple designers working in parallel on different design partition views.

The chapter covers the following sections:

- Manager Mode Tasks
  - Initializing the Design
  - Defining Area-Based Design Partitions
  - Defining Layer-Based Design Partitions
  - Merging or Rejecting the Submitted Design Partitions
- Designer Mode Tasks
  - Editing a Design Partition by Single or Multiple Users
  - Editing an Area-based Design Partition
  - Editing in a Layer-Based Design Partition
  - Reviewing Updates
  - Importing a Peer Partition
  - Checking All Edits
  - Checking and Resolving Edit Conflicts

Manager Mode Tasks

The manager should have write permission on the top design for creating design partition views.

Initializing the Design

The first task for the manager is to initialize the design to get it ready for concurrent editing. To do this, perform one of the following:

- On the *Concurrent* menu, select *Initialize*.
- Select the Concurrent Layout assistant, click the *Initialize* button.

Initialization saves some information about all the objects in the design. It is used as a reference later to identify and merge back the objects edited in a design partition.

After the design is initialized for concurrent editing, additional options will be available on the *Concurrent* menu and the Concurrent Layout assistant. For more information on the options available in manager mode, see *Concurrent menu* and Concurrent Layout Assistant in Manager Mode.

Defining Area-Based Design Partitions

After the design is initialized, you can start defining design partitions based on your editing requirements.

Tip

You should partition the design carefully to avoid partition overlapping that will increase the likelihood of edit conflicts among design partitions. Additionally, try to not use a global container, like a FigSet, across partitions.

To define an area-based design partition:

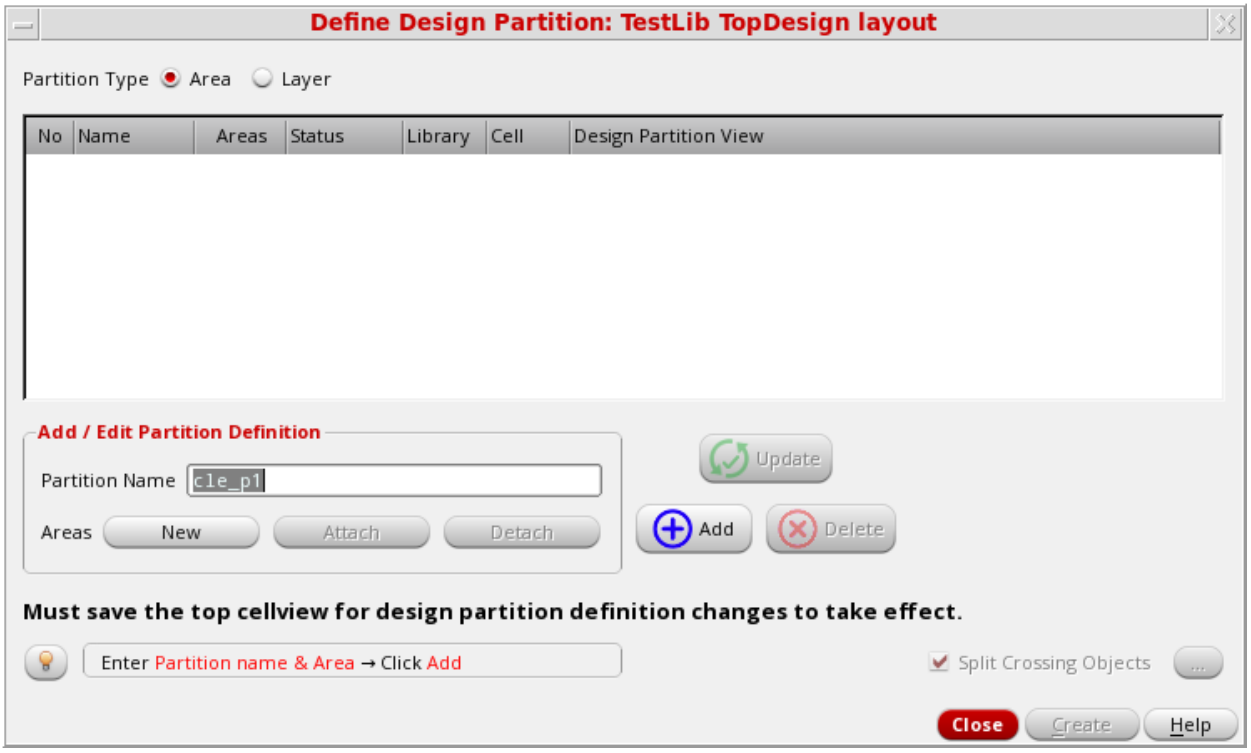
1. On the Concurrent Layout assistant, click the *Define Design Partition* button or choose the *Define Design Partition* command on the *Concurrent* menu.

   The Define Design Partition form appears.

2. For *Partition Type*, select *Area*.

3. Click *Add*.

   A design partition with corresponding design partition view is added. Click *Add* if you want to add more design partitions.



The status of the new design partitions is *Defined*. If a design partition view already exists the status is *Reuse*.

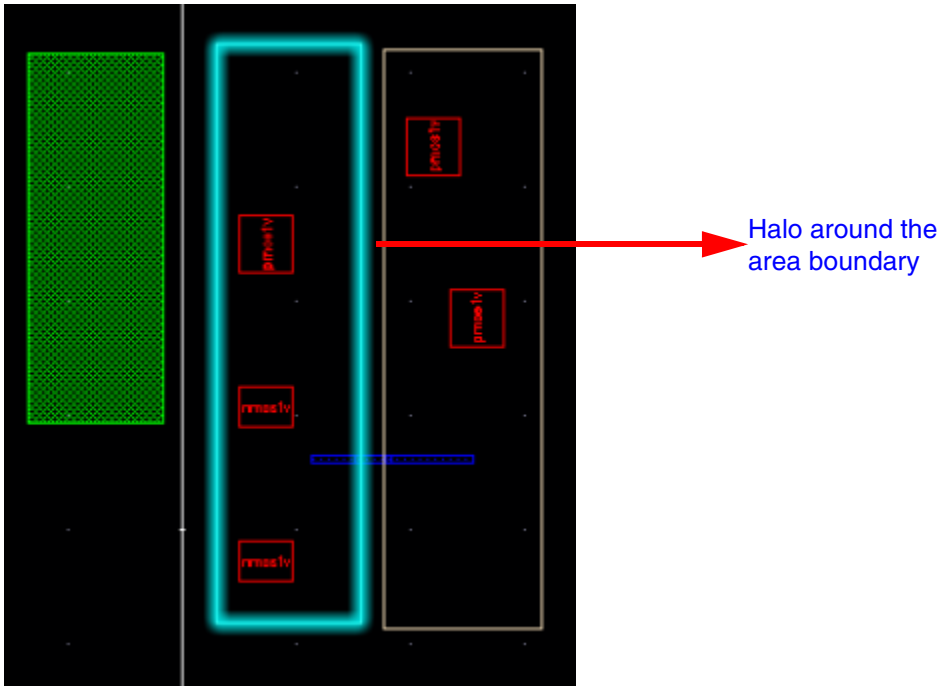
By default, the names of the new design partitions and the corresponding design partition views are `cle_px` and `layout_cle_px`, where `x` is a number. You can use the corresponding text boxes to specify different names.

Concurrent Layout uses the definition you made in the Define Design Partition form to identify which object belongs to which design partition. Information about the objects

undergoing modification in a design partition is stored in the associated design partition view.

Edit scope for each design partition is set to select only those objects that are inside the current partition by default. You can change these settings from Concurrent Layout Options form or from the Concurrent Layout assistant in designer mode.

If *Edit Scope* is set to *Off,* editing objects outside the partition generates alerts in the Concurrent Layout assistant. You will have to individually sign off each alert and warning.



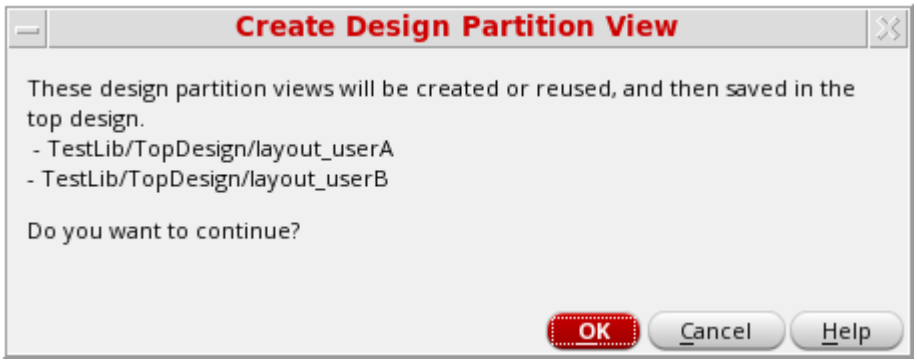
3. Next, attach one or more areas to the selected design partition:

   To attach an area to the selected design partition, select the area boundary and then click the *Attach* button for the *Areas* option. Alternatively, click the *Attach* button and then select area boundaries on the canvas to attach. For further assistance, press `F3` to display the Attach / Detach Areas form. After you have done the adjustment, click *Update* to apply the changes.

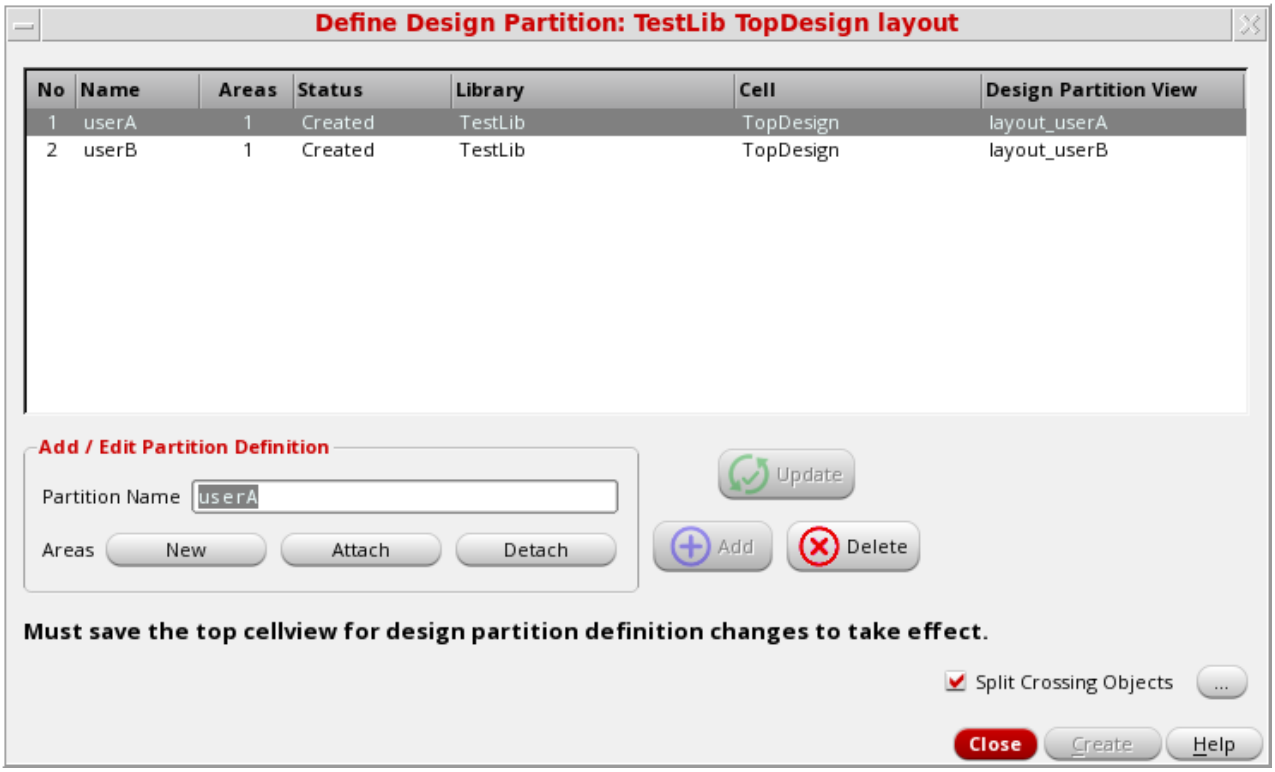
   Note:

4. After you have completed defining all the design partitions, click *Create*.

A message box is displayed informing you about the design partitions that will be created.



5. Click *OK*.



The following actions take place:

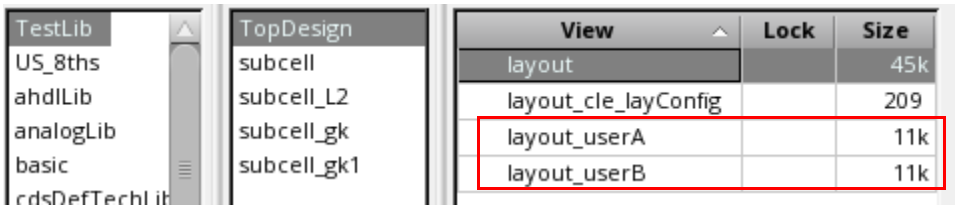
- Design partition views are created and the status Created is displayed in the Defined Design Partition for and the Concurrent Layout assistant.
- The top design is saved.

- Objects crossing the design partitions are split at the boundary. This happens because the *Split Crossing Objects* option is selected by default. To change the settings of how crossing objects are handled, click the button next to the *Split Crossing Objects* option to display the Split Crossing Objects Options form.

6. Click *Close* to exit the Define Design Partition form.

   Note: In the Design Management environment, an additional dialog box is displayed to confirm that new design partition views have been checked into the design management system.

7. Open the *Library Manager* to review the created design partition views and observe the changes.



   The created design partition view is of the minimum size. This is because only the changes made to the associated design partition are saved in this view.

Designers must have write permission to open a design partition view for concurrent editing. In the Design Management (DM) environment file permission is handled by the DM check-in and check-out process. Otherwise, the manager can use UNIX commands to change the file permissions.

When the manager and designers are in the same group, the following command can be used to grant the group write permission:

```
chmod -R g +w <design_partition_views>
```

Alternatively, you can change UMASK as shown below before launching Virtuoso to set the file permission for all the files created by the current Virtuoso process.

```
% umask
=> 22
```

Change the UMASK setting and start Virtuoso. You might need this setting when the manager and designers are not in the same group.

```
% umask 0
```

The UMASK change affects all new files in the current Virtuoso session; if you use commands such as Save As and Copy, the file permission might not be as expected.

```
% virtuoso &
```

After you have defined and saved new design partitions, exit Virtuoso and restore the UMASK setting by using the following command.

```
% umask 22
```

Defining Layer-Based Design Partitions

After a design is initialized, you can start defining layer-based design partitions as follows.

1. On the Concurrent Layout assistant, click the *Define Design Partition* button or choose the *Define Design Partition* command on the *Concurrent* menu.

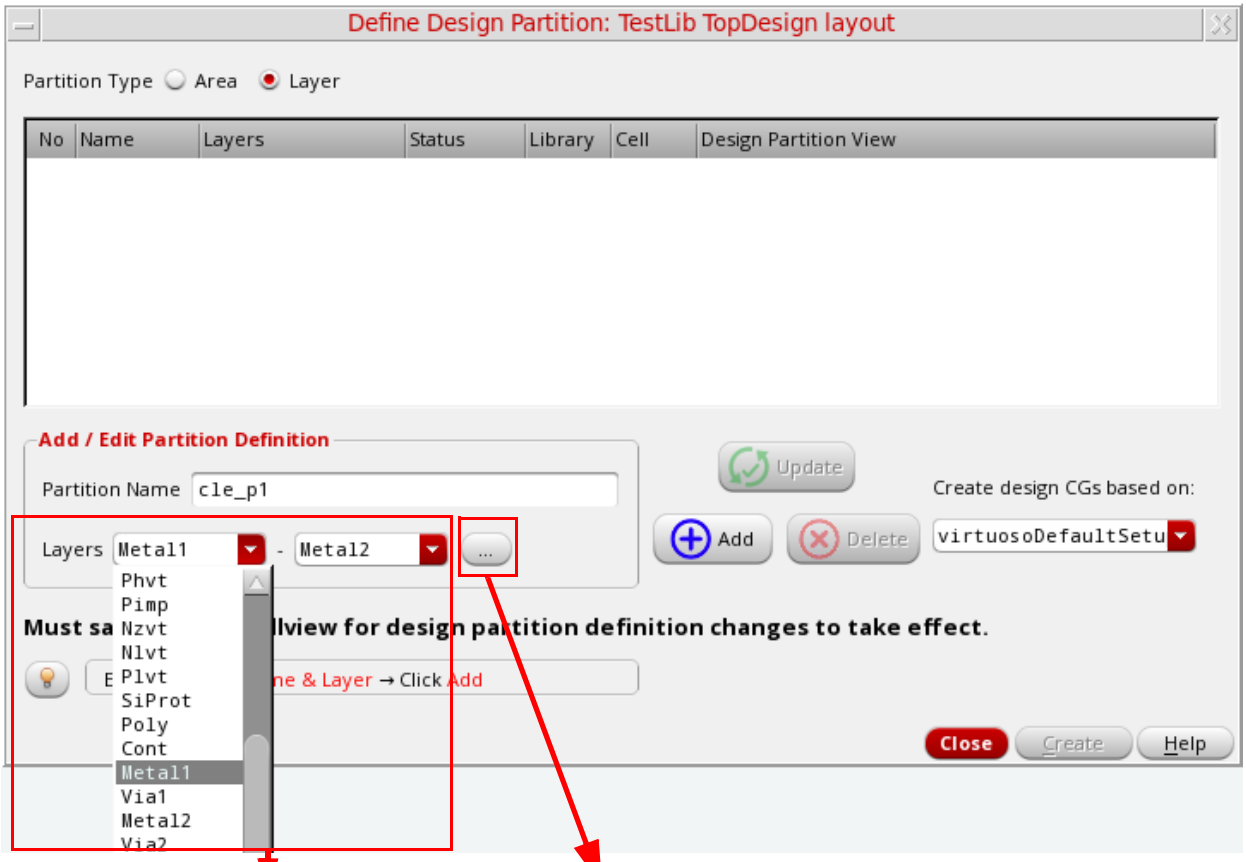
   The Define Design Partition form appears.

2. For *Partition Type*, select *Layer*.

3. In the *Partition Name* field, specify a name for the new design partition, if needed. If you do not specify a name, the default name in this field is used.

   Note: To change the name of a design partition after it is added, select the design partition in the table above, specify the new name in the *Partition Name* field and then click the *Update* button.

4. Specify the top and bottom layers to be included in the design partition in the *Layers* field.



5. To remove certain layers from the layer range or add other visible layers from the Palette, click the *Layer Preview* button.

   The Partition Layers form that appears.

   In this form you can:

   - ❑ Preview the layers included in the design partition.
   - ❑ Clear the check boxes of the layers you do not want to include in the design partition.
   - ❑ Import additional layers from the Palette by clicking the *Import Visible from Palette* button.

6. (Optional) To rebase a Concurrent Layout constraint group to a different parent constraint group, select it from the *Create design CGs based on* drop-down list and then click *OK* in the message box.

   This option specifies the parent constraint group based on which all the Concurrent Layout constraint groups dedicated to each design partition are created.

7. Click *Add* to add one or more design partitions.

   A design partition with the corresponding design partition view is added.

   The status of the new design partitions is *Defined*. If a design partition view already exists, the status is *Reuse*.

   By default, the names of the new design partitions and the corresponding design partition views are `cle_px` and `layout_cle_px`, where *x* is a number that is incremented for each new design partition. You can use the corresponding text box to specify different names.

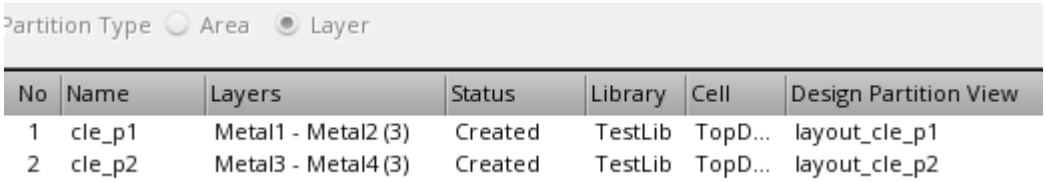
8. After you have completed defining all the design partitions, click *Create*.

   A message box appears listing the design partitions that will be created.

9. Click *OK*.

   You will notice the following:

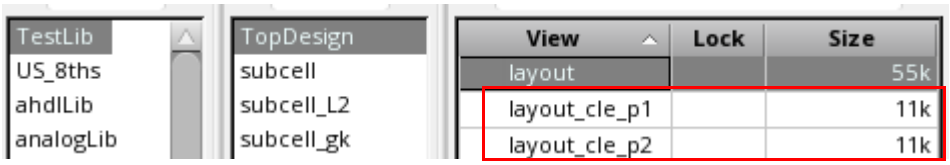
   - Design partition views are created, and the status *Created* is displayed in the Defined Design Partition form and the Concurrent Layout assistant.
   - The top design is saved.
   - Two types of Concurrent Layout constraint groups dedicated to each design partition are created to enable layer constraints. For more details, see Editing in a Layer-Based Design Partition.



10. Click *Close* to exit the Define Design Partition form.

    Note: In the Design Management environment, an additional dialog box is displayed to confirm that new design partition views have been checked into the design management system.

Open the *Library Manager* to review the created design partition views and observe the changes.

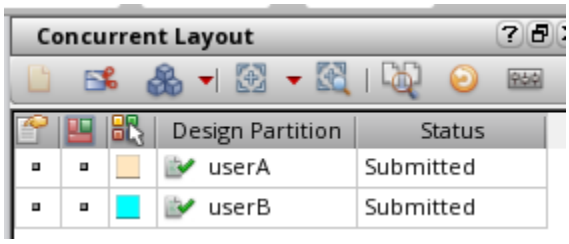


The created design partition view is of the minimum size. This is because only the changes made to the associated design partition are saved in this view.

Designers must have write permission to open a design partition view for concurrent editing. In the Design Management (DM) environment, file permission is handled by the DM check-in and check-out process. Otherwise, the manager can use UNIX commands to change the file permissions.

Merging or Rejecting the Submitted Design Partitions

After the designers have completed editing the design (see Designer Mode Tasks) and submitted their respective design partitions for merge, the manager needs to review these requests and then either approve or reject the merge requests.

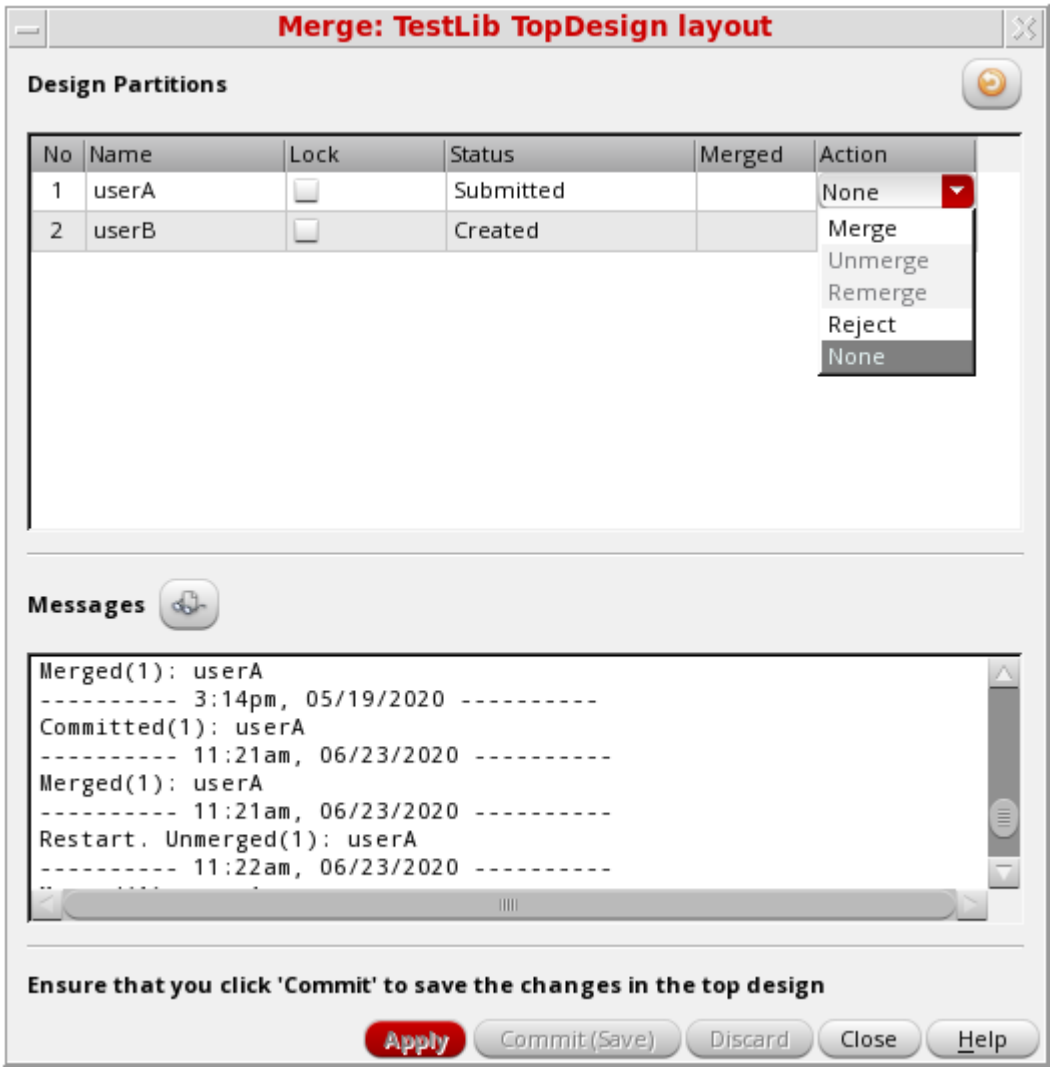


To either approve or reject merge requests:

1. Click the *Merge/Unmerge* button in the Concurrent Layout assistant on the *Concurrent* menu.

   The Merge form is displayed.

2. Click in the *Action* field of the design partitions you want to merge and change the value to *Merge*.



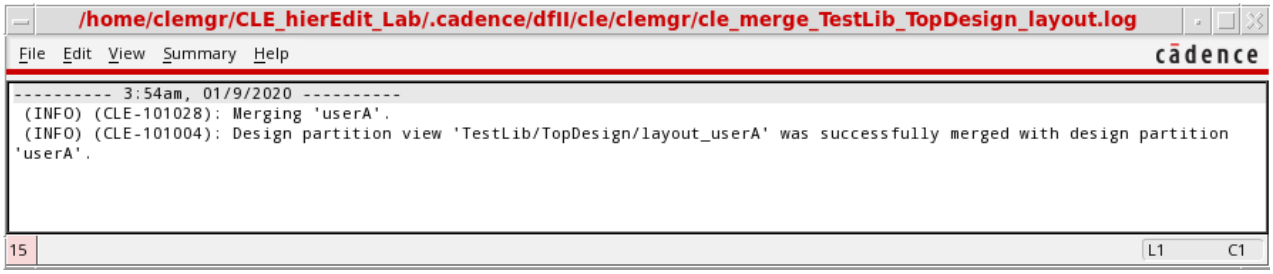
To reject a design partition, in the *Action* field of the design partitions you want to reject and change the value to *Reject*.

3. Click the *Apply* button.

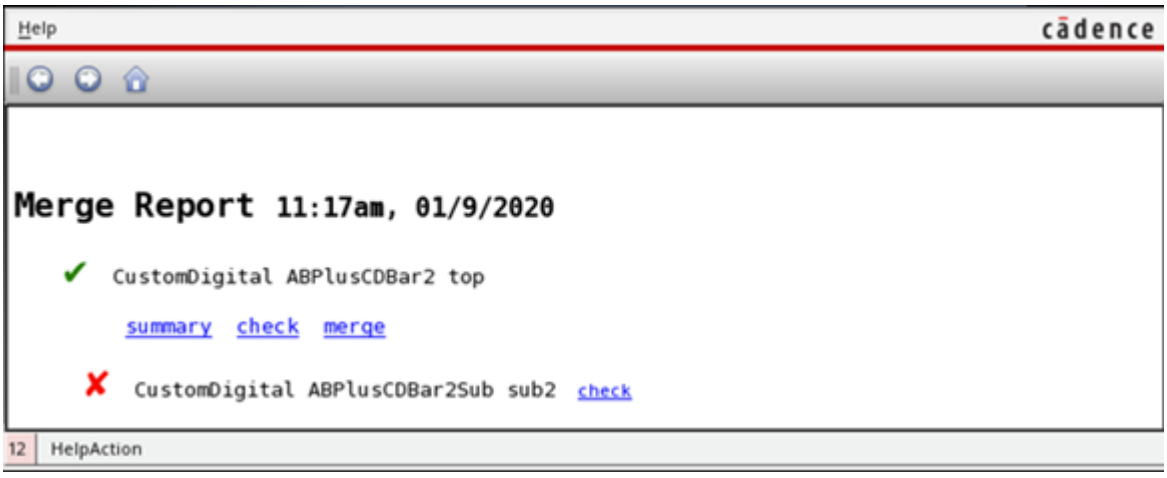
Design partitions with action set as *Merge* will be merged with the top design.

Information regarding the actions taken will be added to the message box on the form.

4. Click on the *Messages* button to view the merge log.



In case a conflict is detected during merge, then when you click the Messages button an HTML file is displayed with the Merge Report. This report will have details about the conflicts as shown in the screenshot below.



5. Select *Commit (Save)* on the *Merge* form to complete the merge process.

   Note: This step recursively merges the children hierarchical design partition views into the subcell and commit the changes.

   In the Concurrent Layout assistant, the design partition view status changes to *Committed*.

For rejected partitions the Reject Submission form is displayed. Provide the reason for rejecting the merge request and click *OK*.

In the Concurrent Layout assistant, the status of the rejected design partitions will change to *Rejected* and the status of the merged partitions will change to *Merged*.

Note: When the merge process is in progress, manager should make changes only in the design partition view. Any direct edits to the top design during merge are discarded when the top is reverted to the previously unmerged state.

Designer Mode Tasks

After the required design partition and design partition views are created, designers can start editing in the allocated design partition views. Concurrent Layout can be used both in single-user and multiple-user modes. Designers should have write permission on design partition views that store the edits of the top design.

Editing a Design Partition by Single or Multiple Users

In single-user mode the manager can move to designer mode to edit the design. Updates made in Concurrent Layout do not affect the top design until you merge the updates made in the design partition views with the top design. This is why you can use concurrent editing in single user mode to edit the design in different ways, and then merge the update that works the best.

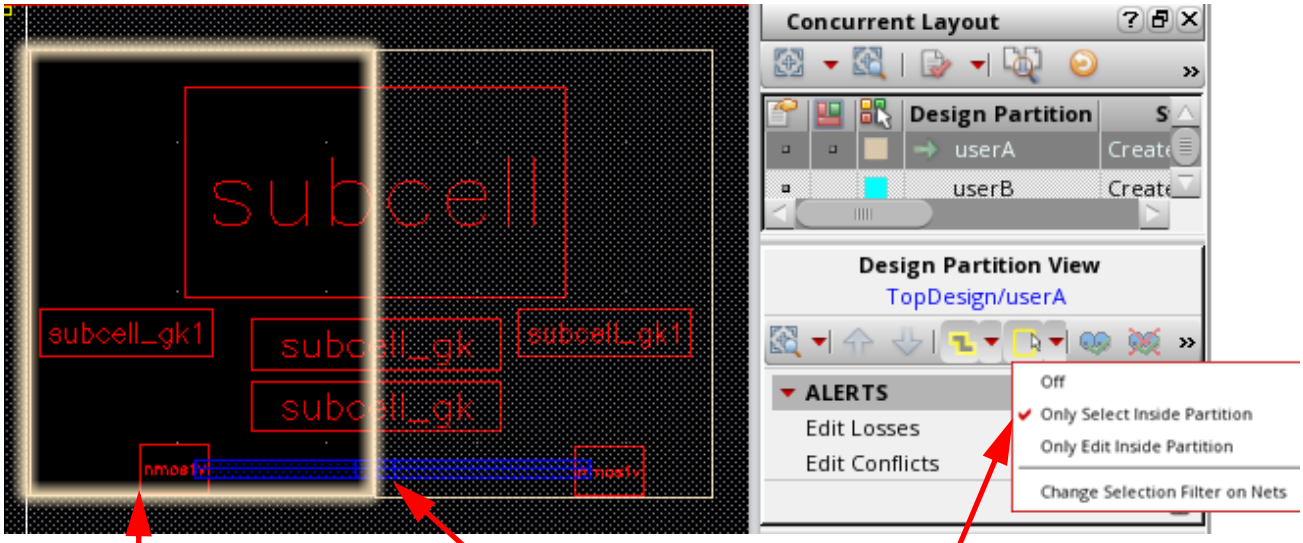
When a ***single user*** is editing the design, in the *Concurrent Layout* assistant right-click the design partition you want to edit and select *Edit in Design Partition*. The design switches to designer mode.

If ***multiple users*** are working on different design partitions open Library Manager and then select the design partition view you want to edit.

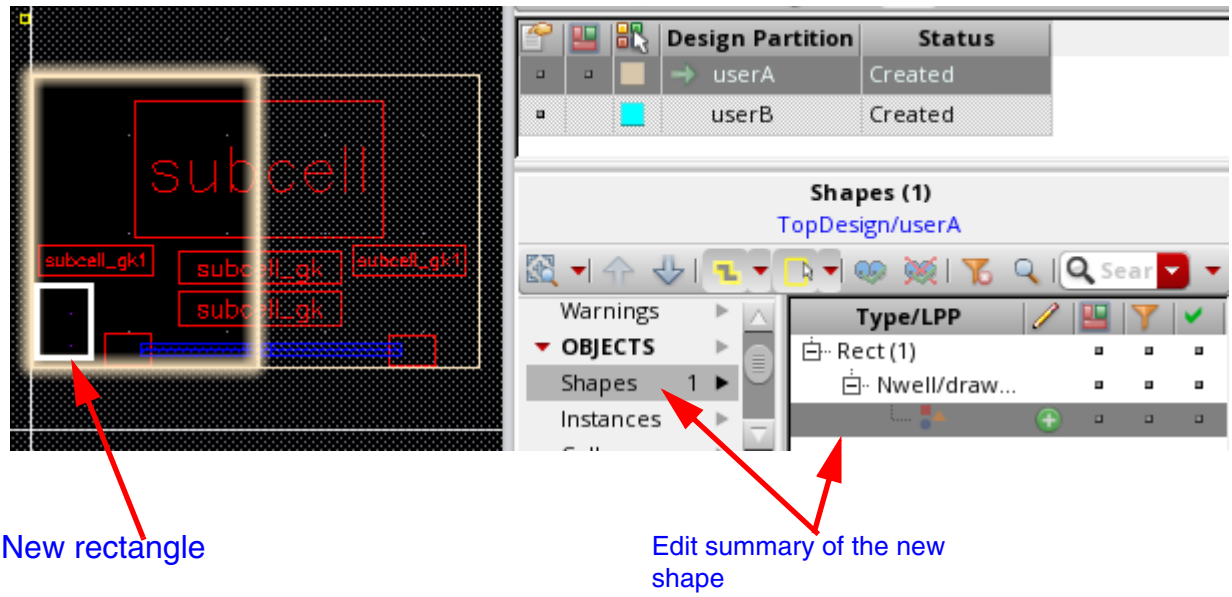
Editing an Area-based Design Partition

In designer mode, by default in area-based design partitions, the area boundary for the selected design partition is highlighted and the region outside to it is grayed out. This happens because the *Only Select Inside Partition* option is enabled by default in the *Concurrent Layout* assistant.

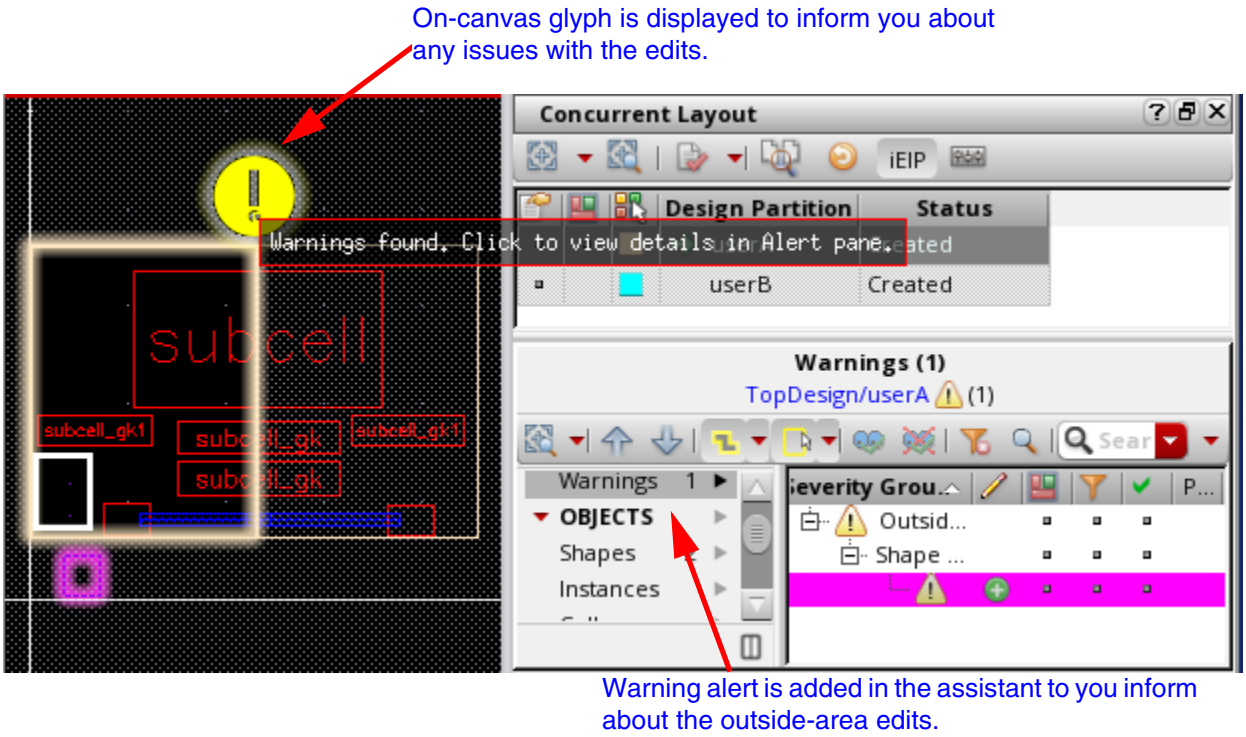
This helps in preventing users from selecting any objects outside their area partition. Additionally, wire that is crossing the design partition is split by default at the boundary.



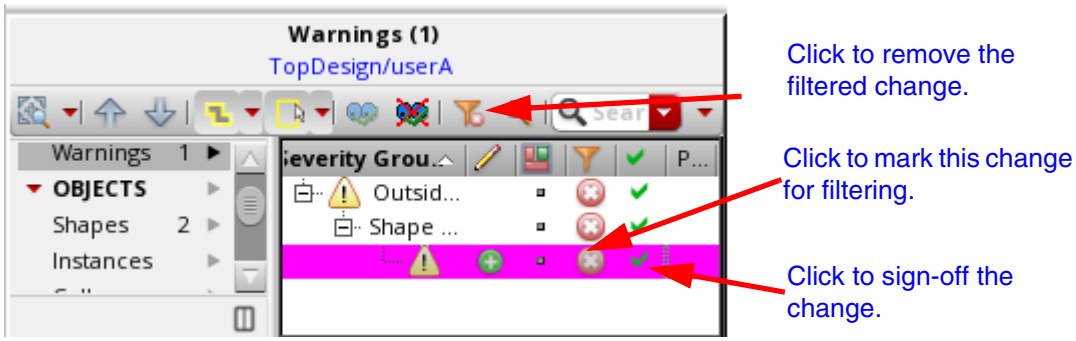
1. To edit the design, lets create a rectangle, inside the partition.



1. Next, add a shape outside the current design partition.

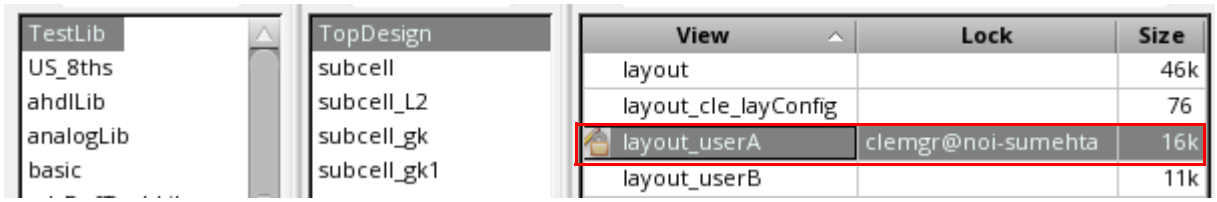


You will have to sign of the edits that are done outside the area boundary of the current partition. If your edit was done intentionally, sign off should indicate that they need to be retained. If any edits are not to be retained, use the filter to mark these changes and then use the *Remove Changes from Design Partition View* button to delete the filtered changes.



After you have completed editing the design, save the design. The status of the design will change to *Not submitted*. You can continue editing the design after saving.

Save the design when editing is complete. You can now check the size of the edited design partition in Library Manager. You will notice a marginal increase in the size indicating that the design partition now comprises saved changes.



Editing in a Layer-Based Design Partition

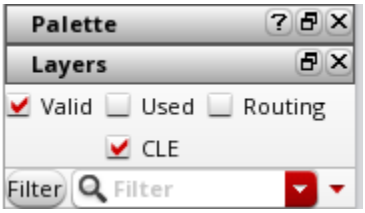
When you create a layer-based design partition, two constraint groups dedicated to it are also created automatically. These constraint groups are applied according to Edit Scope settings to enable the layer constraint while routing.

The following table shows these two constraint groups associated with a design partition. The *Type 1* constraint group uses the same name as the design partition, and the *Type 2* constraint group adds `_res_` to its name denoting that it restricts valid vias based on the design partition definition.

Design Partition	Constraint Group Type	Constraint Group Name	Process Rules	Via Availability	Edit Scope
`cle_p1`	Type 1	`dsn:cle_p1`	Valid Layers	Keep all valid vias inherited from the parent constraint group.	*Only Select Inside Partition*
	Type 2	`dsn:cle_res_p1`	Valid Layers Valid Vias	Restrict valid vias by removing those outside the design partition definition from the parent constraint group.	*Only Edit Inside Partition*

When you open a layer-based design partition, the Layer Palette, the Default Wire Constraint Group, and the Default Via Constraint Group change according to the Edit Scope.

The *Only Select Inside Partition* option is enabled by default, and when this option is active, the *CLE* filter is available in the *Layer* Palette.



The *CLE* filter is selected by default and lets you see only those layers that are available in the current layer-based design partition. Even if you deselect this filter to show all layers, for layers outside the design partition definition cannot be selected. The Default Wire Constraint Group and the Default Via Constraint Group change to the *Type 1* constraint group. When you create or modify a via for which the cut layer is outside the current design partition definition, a warning glyph is displayed. Sign off these edits in the assistant, to retain them.

Enabling the *Only Edit Inside Partition* option enables the *CLE* filter in the *Layer* Palette and applies the *Type 2* constraint group.

If you change the status of Edit Scope to *Off*, the *CLE* filter in the *Layer* Palette is disabled and hidden and you can see and use all layers. The Default Wire Constraint Group and the Default Via Constraint Group are reset. You must sign off all intentional edits that are outside the current design partition.

Reviewing Updates

To review the updates you have made:

➡ Right-click the design partition and select *Show Detailed Changes*.

Updates made to the design are highlighted in the canvas. Make sure that updates are as needed, otherwise, make the required edits.

Importing a Peer Partition

To import changes made to the peer design partitions:

➡ Right-click the design partition and click *Import Peer Design Partitions.*

Alternatively, choose *Import Peer Design Partitions* on the Concurrent menu.

The Import Peer Design Partition form is displayed. Use this form to select and import updates from peer partitions. This option is useful in viewing the updated design as a whole.

Note: Updates imported from peer partition are just for your reference. You cannot submit these changes for merge or make any further edits.

In constraint-aware editing, when a new wire with net is imported from a peer partition, to prevent wire commands from changing this wire and prevent edit loss, Concurrent Layout automatically sets the wire to locked. This triggers Constraint Manager to create a locked constraint on the wire's net that, in turn, prevents designers from moving the wire, preventing edit loss. This constraint appears only when such peer partition is imported.

Checking All Edits

To check your edits after importing peer designs:

➡ Right-click the design partition and click the *Post-Edit Check All Edits* option.

This command lets you check all objects modified by you to check for any new violations. Any warning or alerts related to violations and edit conflicts are reflected in the *Summary Pane* and *Details Pane* of the Concurrent Layout assistant.

Checking and Resolving Edit Conflicts

To check the log of all conflicts:

➡ Right-click on the design partition and then click *Check Edit Conflicts*.

The Check Edit Conflicts form is displayed. You can use this form to thoroughly check for conflicts between the selected design partitions and the top design. You should either resolve or sign off edit conflicts before submitted your design for merge. You can view alerts and warnings and then either resolve or sign-off these conflicts from the *Summary Pane* and *Details Pane* of the Concurrent Layout assistant.

Merging a Design Partition

To merge a design partition with the top design:

1. Click the *Submit for Merge* button on the *Concurrent Layout* toolbar in the Concurrent Layout assistant.

Alternatively, choose the *Submit for Merge / Recall* command in the *Concurrent* menu.

2. If the Save Changes dialog box is displayed, click *Yes* to save the design.
3. Review the details in the Submit for Merge dialog box and click *OK*.

   The status of the design partition will changes to *Submitted* and the *Submit for Merge button* on the *Concurrent Layout* toolbar will changes to *Recall*.

Recalling a Design Partition

To recall a design partition submitted for merge:

1. Click the *Recall* button on the *Concurrent Layout* toolbar in the assistant.

   Alternatively, choose the *Submit for Merge / Recall* command on the *Concurrent* menu.

2. In the Recall Submission dialog box, click *OK*.

   The design partition will be recalled and the status will change to *Editing*.

Important

You can recall a design partition only if the manager has not yet merged it.

Working with Hierarchical Designs

Hierarchical editing in the CLE flow lets multiple designers concurrently Edit In Place (EIP) into hierarchical subcells. The edit scope is retained in both area and layer-based design partitions. In area-based design partitions, area partitions defined at the top are pushed down the hierarchy. In layer-based design partitions, edit scope is limited to the layers available in the top design partition.

Concurrent hierarchical editing has two modes, Regular and Incremental. Concurrent Layout automatically detects the case and enables one of the following modes for hierarchical editing.

- **Regular mode**

  The main cellview is edited, and only one designer can edit at a time. This implies that concurrent editing of a hierarchical subcell is not possible in this mode. Additionally, it is not possible to undo any changes after they are saved. Hierarchical editing is done in regular mode when one of the following is true:

- The hierarchical subcell has one or more occurrences and they are all in a single design partition.

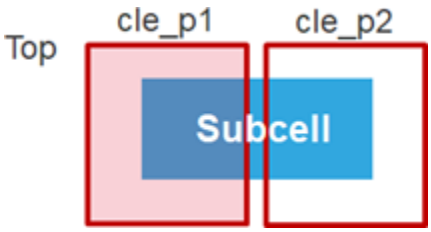
- The hierarchical subcell has one or more occurrences and they are in two or more design partitions.

Note: The Concurrent Layout assistant is disabled in regular mode.

■ Incremental mode

The original hierarchical subcell is not modified. Hierarchical design partition views are created when you descend into the design. Area partitions from the parent top partition are pushed down to retain the edit scope in the concurrently edited hierarchical subcell. This mode is enabled when the following conditions are true:

- Top-level design partitions are area-based.
- The subcell straddles two or more design partitions.
- There is only one occurrence of this subcell in the top design.

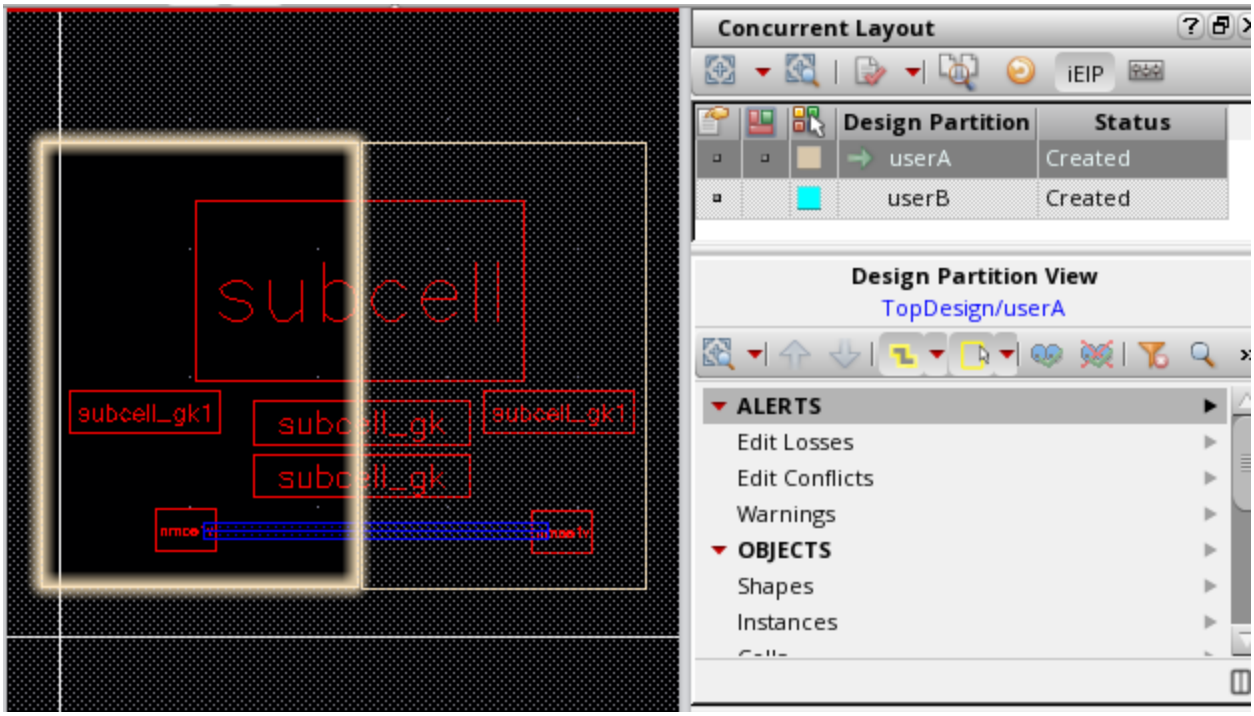


Note: To avoid performance-related issues, checking is performed only to the current display level or to the third level in the hierarchy.

Editing a Hierarchical Design

To edit a hierarchical design:

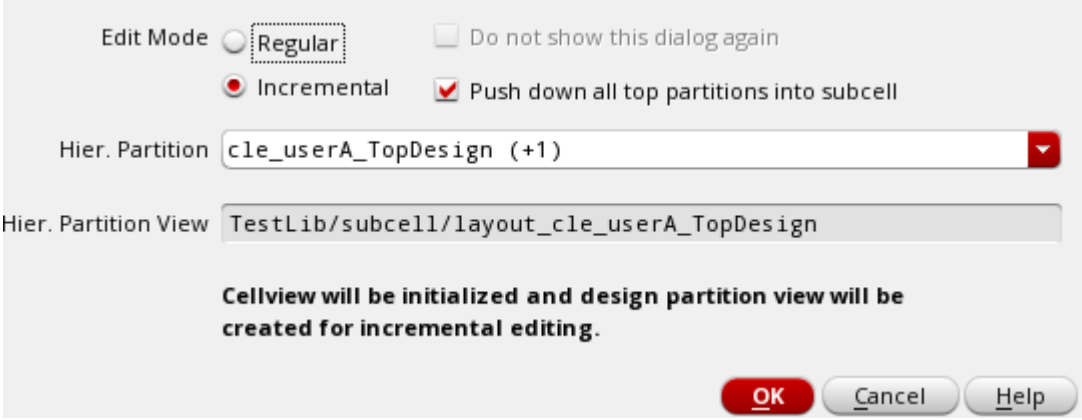
1. In designer mode, open the design partition view that you want to edit.



   Let's assume that the `userA` design partition view is the parent top-level design partition view.

2. Choose *Edit – Hierarchy – Descend Edit* or press `x` to EIP.

3. Point to the subcell you want to EIP. If all the conditions for editing in Incremental mode are met, the Hierarchical Edit Setup Form is displayed with *Edit Mode* as *Incremental*.

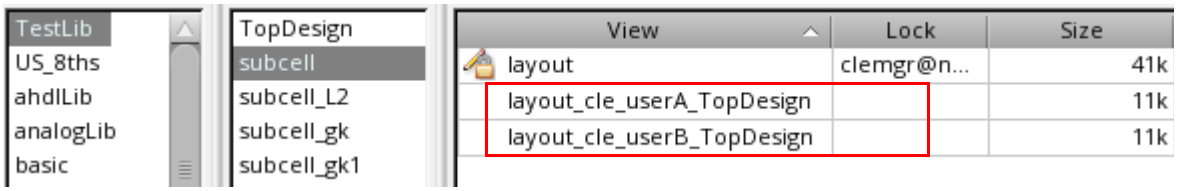


Here,

- In the *Hier. Partition* name, the suffix `(+1)` with the name indicates the number of hierarchical design partition views that will be created. In this case, two hierarchical design partition views will be created one for the current user `userA` and another one for the peer user `userB`.
- The *Hier. Partition View* name contains the name of the top design partition view, `userA`, and the name of the top design, `TopDesign`.

4. Click *OK* to create the hierarchical design partition views for the subcell.

You can check these views in the Library Manager.

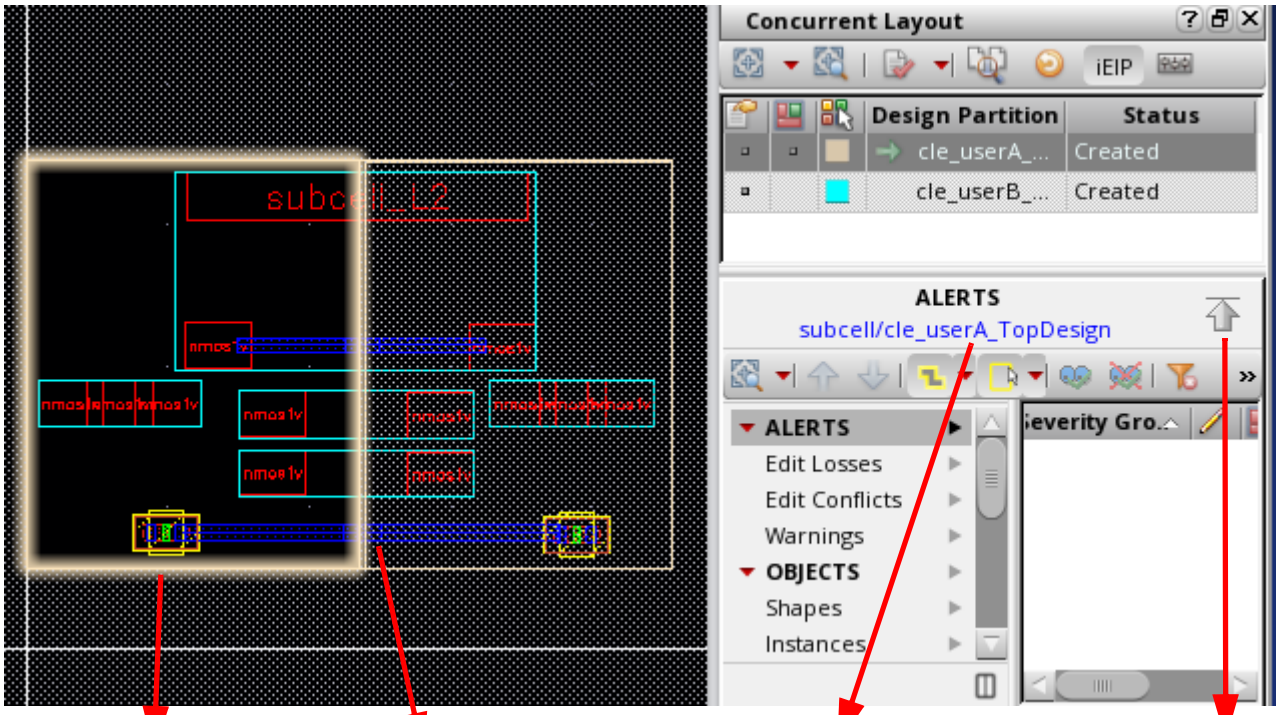


Here, `layout_cle_userA_TopDesign` is the incremental view for `userA` and `layout_cle_userB_TopDesign` is the incremental view for `userB`.

When you EIP this hierarchical subcell from the top design partition view `layout_userB`, you are automatically redirected into the incremental hierarchical partition view `layout_cle_userB_TopDesign`, which was created by the first peer designer `userA`. Therefore, Hierarchical Edit Setup Form will not be displayed.

The *Hier. Partition View* (child) stores a reference back to the top-level design partition (parent) and all the incremental descend edits. The parent design partition area is now

pushed down to the child so the designer can continue to edit in the same design partition area across the hierarchy.



5. Make some edits in the design and click *File – Save* to save the changes.

   Note: Changes made to the EIP design partition are saved in the EIP design partition view.

6. To return to the top-level design partition view, choose *Edit – Hierarchy – Return to Level.*

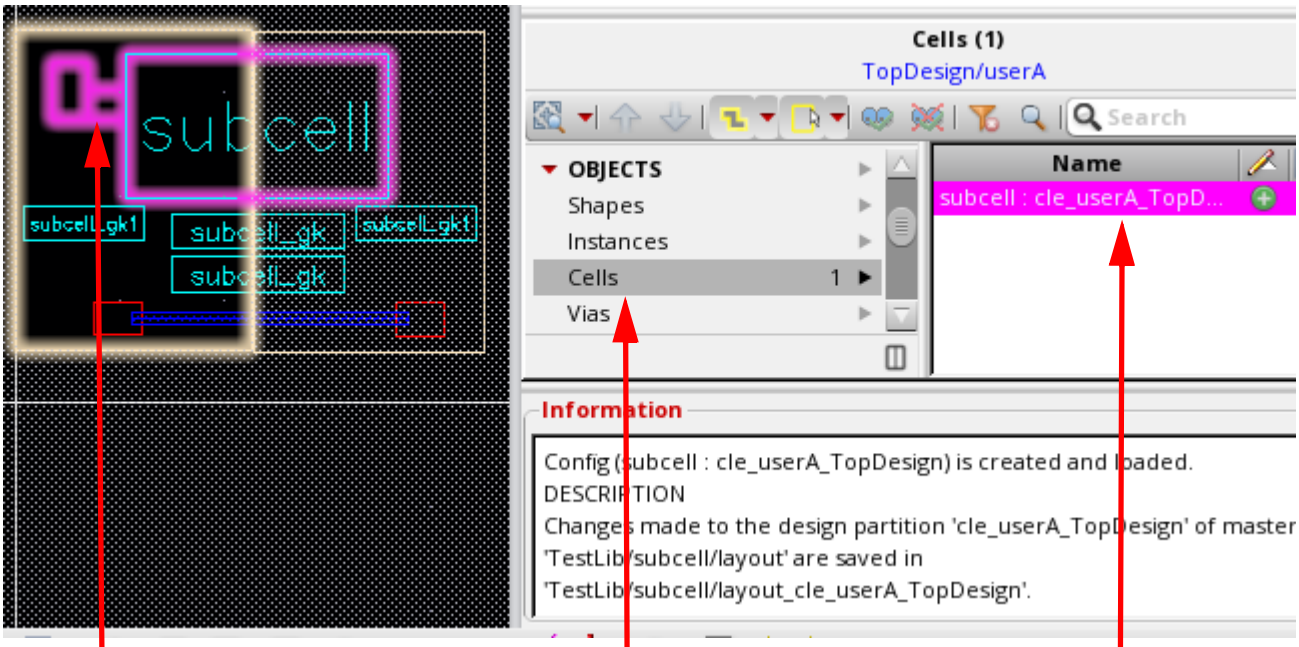
   Alternatively, click the *Return to top partition* button in the Concurrent Layout assistant.

   When doing incremental EIP, the top-level design partition view is at level 0, whereas incremental EIP happens at level `n`, where `n` represents the level of the hierarchical subcell being edited.

7. To view all changes made during incremental EIP, right-click the object representing the hierarchical design partition view and choose *Show Detailed Changes (EIP)*.

   This will perform EIP in read-only mode. The object is shown in the *Cells* category in the *OBJECTS* section on the *Summary* Pane.

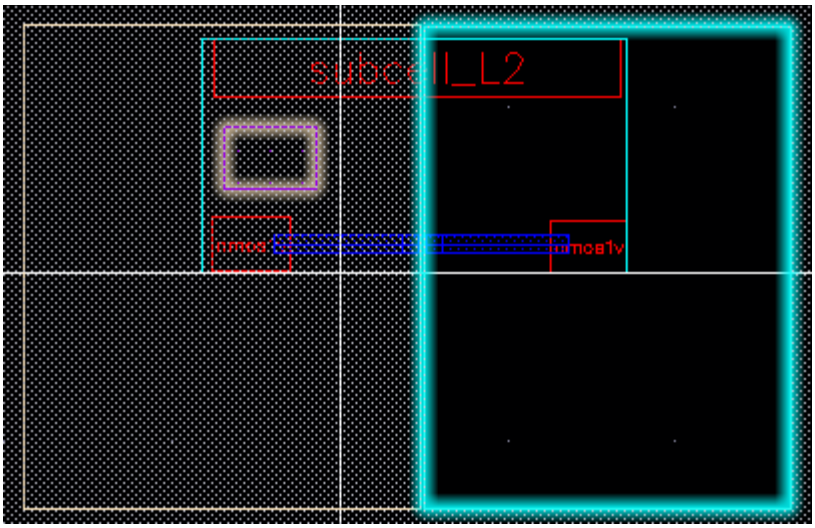
Note: Updates made in Regular mode are not displayed here.



8. At the top-level design partition view, click *File – Save* to save this layout configuration, which is a reference to the child hierarchical design partition that you just edited.
9. Repeat these steps for the peer design partition.

When you open the peer design partition, the Import Peer Design Partition form is displayed. Click *Yes* or *No* based on whether you want to view changes made by the peer user.

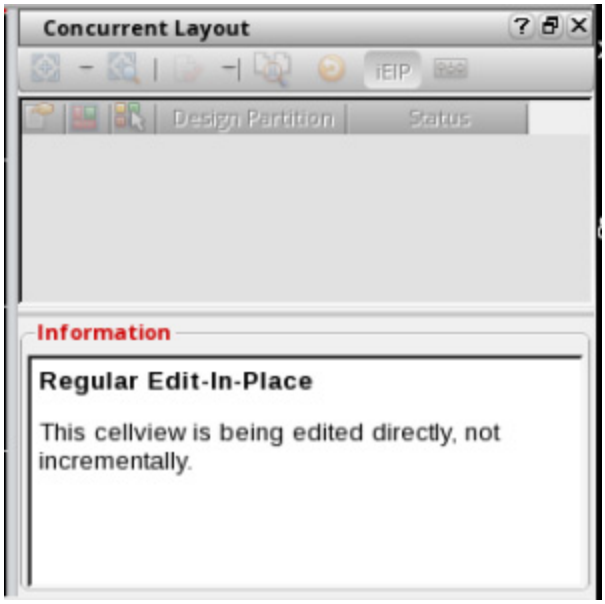
If you choose to import peer changes, the imported changes are marked by a halo in the canvas.



You can use the Layout Configuration form in Concurrent Layout to load or unload the changes in the design hierarchy.

Load the changes if the changes look fine in all occurrences of the subcell and unload the changes if the changes look incorrect in other occurrences of subcell.

Incremental EIP cannot be done from a read-only top partition. Therefore, when you EIP from a read-only top partition or if a subcell cannot be opened for editing, EIP is done in regular mode. The following information displayed in the Concurrent Layout assistant.



Merging Incremental EIP Updates

Merge at the top design is made easy because the parent and the child are kept in sync. For example, submitting the parent design partition view for merge automatically includes all child design partition views. Similarly, opening a submitted child design partition view for edit will automatically recall both the parent and child design partition views. Merging a parent will automatically load the children into the memory. To verify DRC, ensure to stream out the entire design hierarchy from VM.

Return to the top-level design partition. Next, to submit updates made in the subcell, click the *Submit for Merge* button on the Concurrent Layout toolbar in the Concurrent Layout assistant. Alternatively, choose the *Submit for Merge* or *Recall* command on the *Concurrent* menu.

In case you have already exited without submitting for merge:

1. Open the top-level design partition view from *Library Manager*.
2. In the Concurrent Layout assistant, select top design partition to merger and click *Submit for Merge*.

   Alternatively, choose the *Submit for Merge / Recall* command on the *Concurrent* menu.

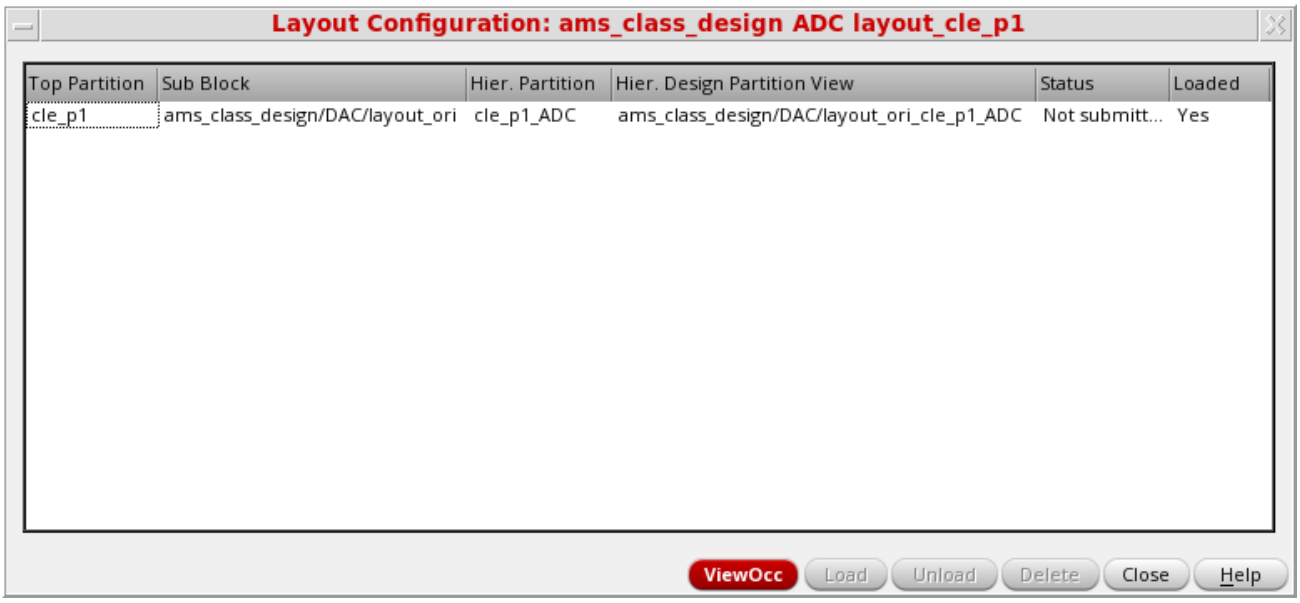
3. In the *Submit for Merge* dialog box, click *OK* and then close the top-level design partition view.
4. Open the top design cellview.
5. Click the *Merge* button on the *Concurrent Layout* toolbar in the Concurrent Layout assistant.

   Alternatively, choose the *Merge* command on the *Concurrent* menu to merge the top-level design partition with the top design.
6. Check the message box for successful merge of all design partition views and automatic loading of layout configurations.

Verifying Incremental EIP Updates

Changes made to the hier. design partition are saved in the hier. design partition view (child) pointed by a layout configuration. When a parent top-level design partition view is opened or imported, the layout configuration is automatically loaded, including all the changes in the child design partition view. These changes are applied to all occurrences of this subcell in the top-level design partition view.

Next time when you open or import a design partition view with a layout configuration, it will be automatically loaded. You can verify this on the Layout Configuration form as shown below.



The value `Yes` in the *Loaded* column indicates that the incremental changes have been imported to the subcell. The manager can see layout configurations in all design partitions

and load them as needed. Layout configurations are loaded automatically for the designer, which means the subcell design in memory will contain the incremental changes. However, if the designer opens the subcell cellview from the disk, the layout configuration is automatically unloaded and an *Unloaded Configurations* warning is displayed in the assistant.

After this subcell cellview is closed, you can click the *Load* button to refresh the selected layout configurations.

Points to Remember

Here are some points to remember while editing in Concurrent Layout:

- Net deletion and property changes of cellviews (`cv~>prop`) are not merged or imported. Net deletions can trigger unexpected deletions in the current partition. They are automatically updated in the top design. Similarly, property changes can cause edit conflicts so they are updated only in the top design.
- Avoid running block-level commands, such as automatic placement and routing, floor planning, pin optimization and, recolor all, because this may generate several edit conflicts if they run in two design partitions.
- Snap Boundary and P&R Boundary are global and should be modified only in the top design.
- *Generate All From Source* is disabled after initialization because it can erase concurrent layout editing data saved in the initial design. Run this command before initialization.
- There will be edit conflicts between two partitions if *Generate Selected From Source* picks the same objects.
- To filter out-of-area markers, type the following in the CIW, and after opening the design partition view, click *Hide Checked Markers* in Annotation Browser.

  ```
  envSetVal("layout.cle" "filterMarkerOutOfArea" 'boolean t)
  ```

- Saving many changes in a design partition view may slow down the open and save process, therefore, it is recommended to merge periodically (> 10k updates), or save the design partition view as a full design partition view to speed up these processes.

A

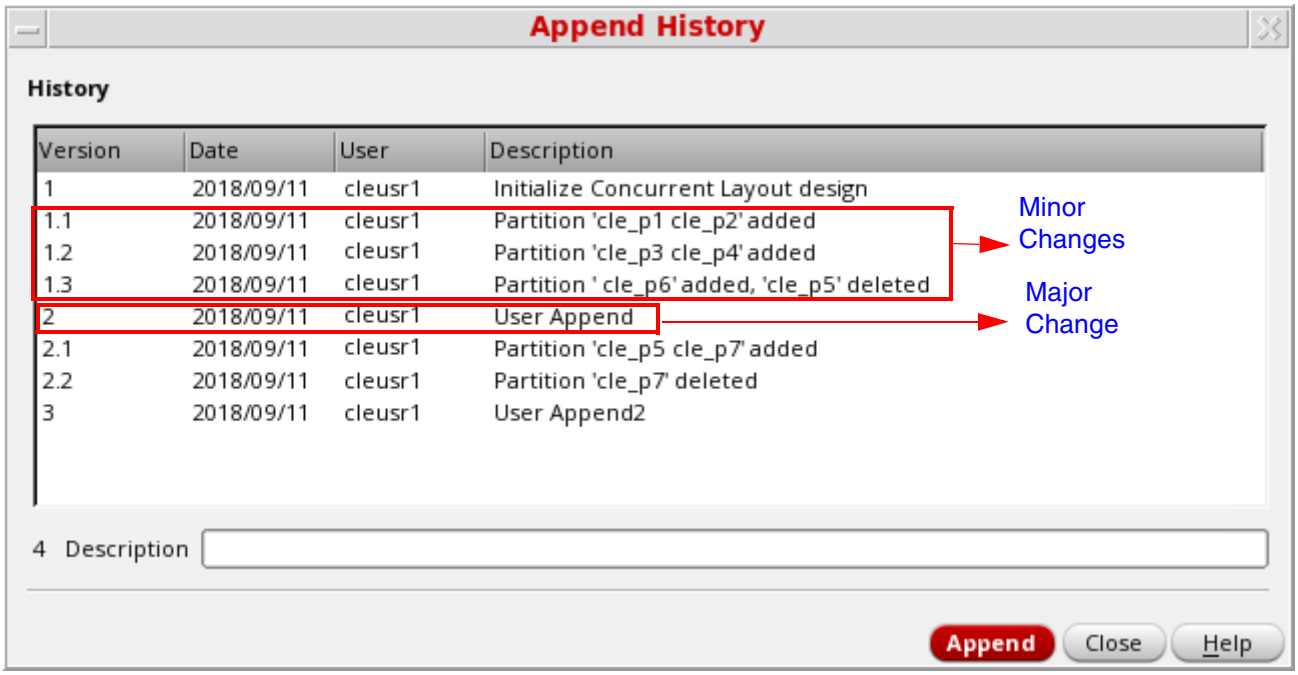
Virtuoso Concurrent Layout Forms

This section lists the Virtuoso Concurrent Layout forms.

- Append History
- Attach / Detach Areas
- Attach / Detach Nets
- Attach / Detach Objects
- Change Design Partition View
- Change Selection Filter on Nets
- Check Edit Conflicts
- Clear All Design Partitions
- Create Area Boundary
- Concurrent Layout Options
- Define Design Partition
- Define Design Partition View
- Edit in Design Partition
- Hierarchical Edit Setup Form
- Import Peer Design Partition
- Layout Configuration
- Merge
- Partition Layers
- Reject Submission
- Remove Changes from Design Partition View

- Save a Copy
- Save as Design Partition View
- Save As Full Partition View
- Save Figures for Comparison
- Select Net
- Split Crossing Objects Options
- View Design Partition
- View History
- View Instance Occurrence

Append History



Managers can use the **Append History** form to inform designers about important changes made to the top design. For example, nets being deleted or new partitions being added.

History displays information regarding the various updates.

Version is the version number of the change consisting of major and minor revisions. For example, a major revision can be to ask a designer to verify the design partition view against the latest top design, while a minor revision is just a record of the design partition change.

Date specifies the date on which the change was made.

User is the user name who made the change as a manager.

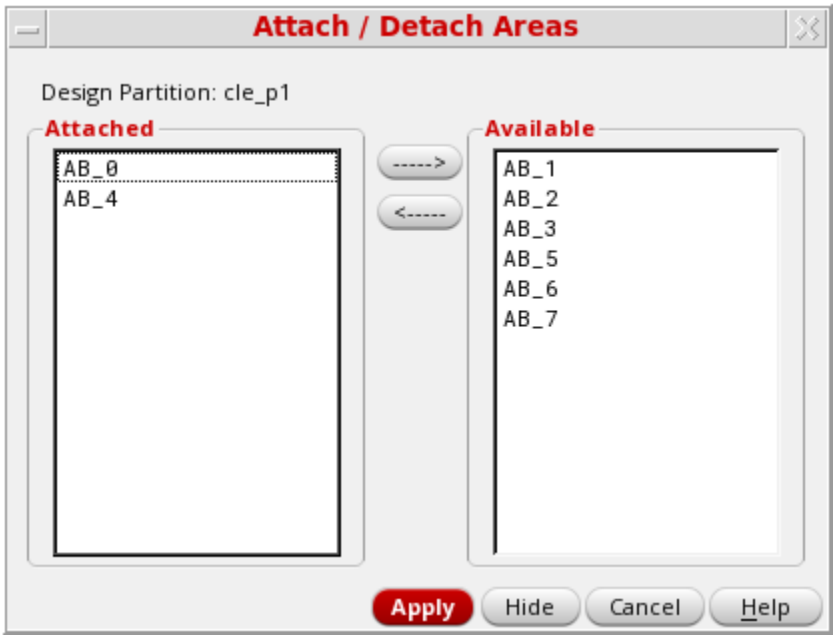
Description is a brief description of the change that was made. The number displayed before the description depicts the version number that will be assigned to the input description when appended.

Managers can specify additional description of the change in the *Description* field. Designers can view this information in the View History form. When designers open a design after a major change, they can be asked to verify the design partition view against the top design. This is indicated by an asterisk (*) on the partition status. After the design partition view is verified, saved, and the major revision is synchronized with the top

design, the designers will not be asked to repeat this activity when the design is opened the next time.

Append adds the description specified by the manager in the *Description* field to the *History* box.

Attach / Detach Areas



Use the **Attach / Detach Areas** form to add or remove area boundaries from the selected design partition. The currently attached areas are highlighted in blue and the selected areas are highlighted in brown.

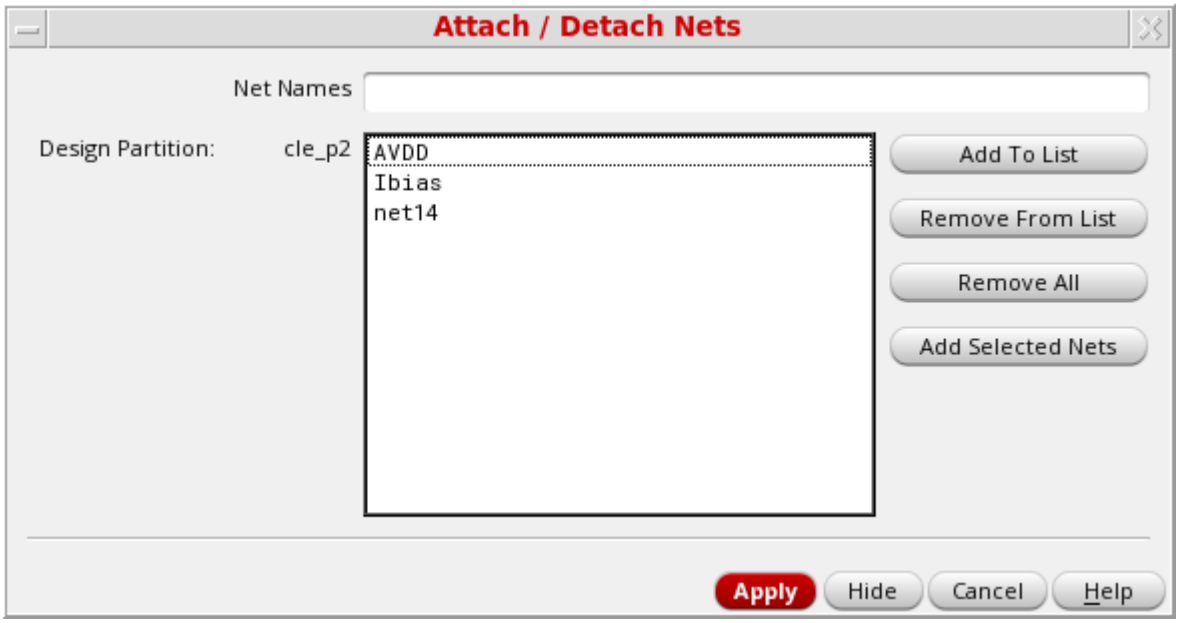
The **Attached** box lists the area boundaries currently attached to the design partition.

The **Available** box lists the area boundaries that can be attached to the selected design partition.

The **Right arrow** button moves the area boundaries selected in the *Attach* box to the *Available* box. These area boundaries are detached from the selected design partition.

The **Left arrow** button moves the area boundaries selected in the *Available* box to the *Attach* box. These area boundaries are attached to the selected design partition.

Attach / Detach Nets



Use the **Attach / Detach Net** form to attach nets to the selected design partition.

Net Names lets you specify one or more nets to be added or removed.

Design Partition box lists the nets to be attached to the specified design partition.

Add To List adds the nets specified in the *Net Names* field to the list.

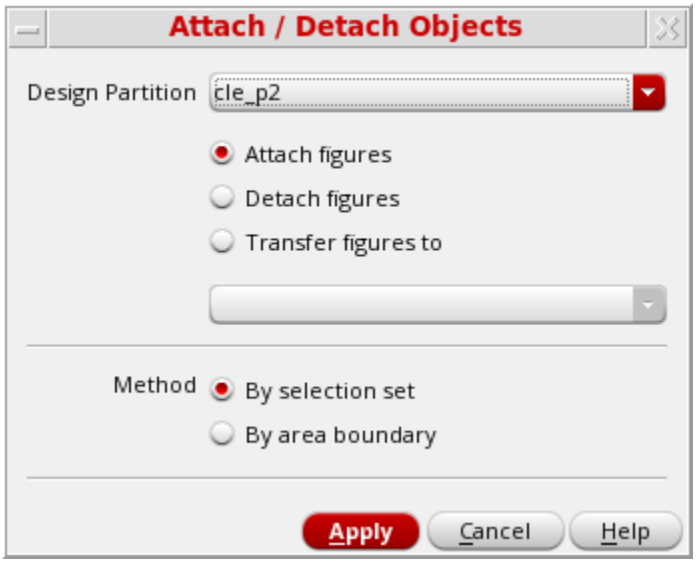
Remove From List removes the nets selected in the Design Partition box or the nets specified in the *Net Names* field from the list.

Remove All removes all the attached nets from the attached nets list and detaches them from the selected design partition.

Add Selected Nets lets you add nets to the list by selecting the nets in the *Navigator* assistant or from the canvas. This option can be used when a large number of nets need to be added to the list and manual typing in the Net Names field is time consuming.

Apply attaches nets on the list to the specified design partition and detaches everything else.

Attach / Detach Objects



Use the **Attach / Detach Objects** form to add or remove objects from the selected design partition. The currently attached objects are contained in a figure group highlighted in green. If you only see the name and outline of the figure group but want to see the details, you can increase the display level, or press `Shift + F`.

Design Partition specifies the design partition to which you want to attach or detach objects.

Attach figures attaches all figures in the selected set or by the area boundary.

Detach figures detaches all figures in the selected set.

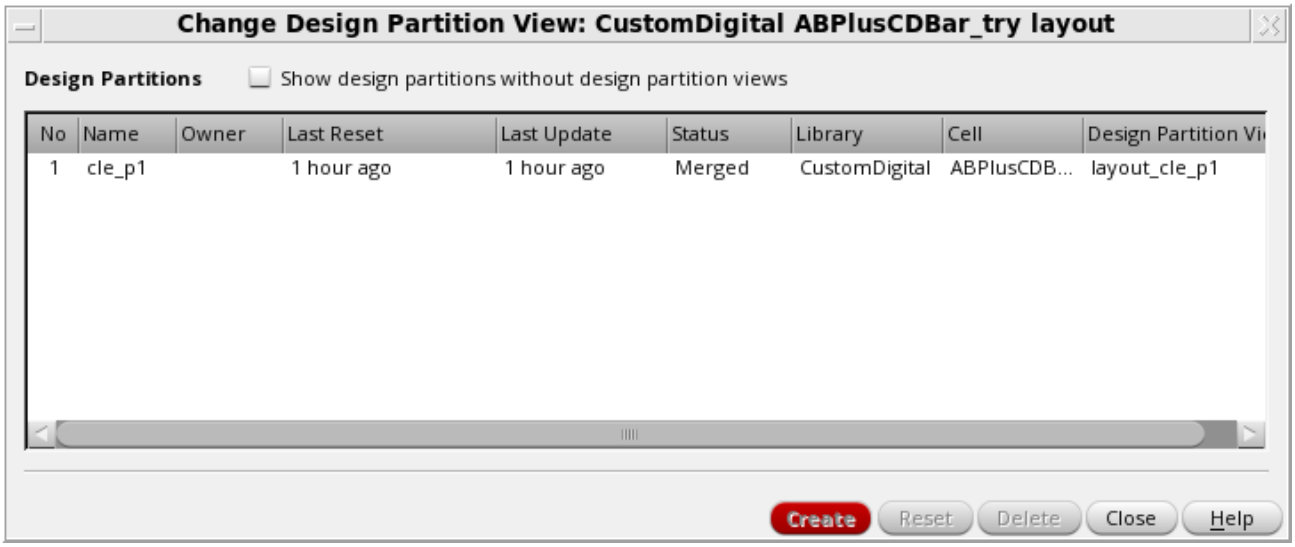
Transfer figures to moves all figures to the design partition specified in the drop-down list given below.

Method specifies how the objects need to be selected

By selection set attaches or detaches the objects selected in the canvas. Concurrent Layout can automatically expand the object set to include more related objects.

By area boundary selects objects from the attached area boundary. This is determined by Selection Options – Area Selection Controls – Full mode – Enclosed figures, Crossed figures or both.

Change Design Partition View



Use the **Change Design Partition View** form lets you manually fix the selected design partition view by resetting partition edits or re-creating the partition view.

Show design partitions without design partition views lets you display those design partitions that do not have associated design partition views. The option is deselected by default.

Design Partitions box lists the currently available design partitions.

Name specifies the name of the design partition.

Owner specifies the owner of the design partition. This information is not mandatory.

Last Reset shows when the partition was reset the last time.

Last Update shows when the partition was last updated.

Status specifies the current status of the design partition. Valid values are *Created*, *Editing*, *Submitted*, *Merged*, *Defined*, *Reset*, and *Rejected*.

Library specifies the name of library of the design partition view.

Cell specifies the cell name of the design partition view.

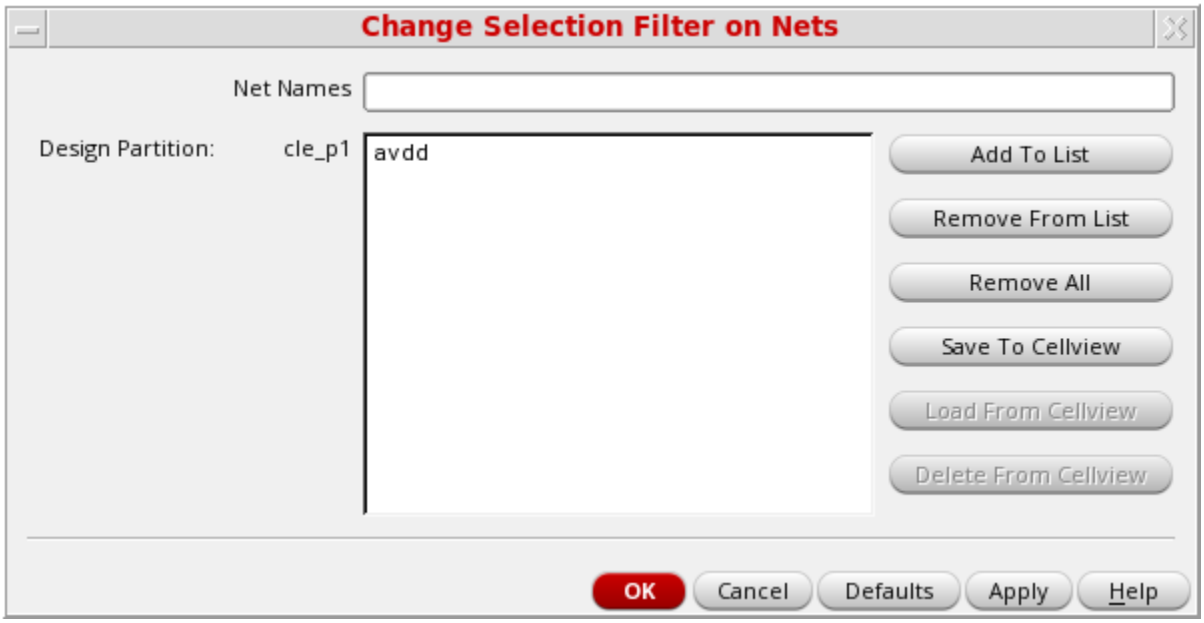
Design Partition View specifies the view name of the design partition view.

Create generates the associated design partition view, and the status changes from *Defined* to *Created*. This is done automatically while saving the top design.

Reset lets you clear all edits in the design partition view. The status changes to either *Created* or *Reset* (if this design partition view was merged before). If a design partition status is *Error*, see the tooltips for the reason and you may fix it by resetting.

Delete removes the selected partition from the existing design partition view but retains the partition. When you delete a partition, the status changes to defined.

Change Selection Filter on Nets



Use the **Change Selection Filter on Nets** form to change the selection filter on nets. Default filter is the currently set net, however, that can be changed.

Net Names lets you specify one or more nets to be added or removed.

Design Partition lists the nets that can be cross-selected in the *Navigator* and the canvas.

Add To List adds net names specified in the *Net Names* field or selected in the *Navigator to* nets list.

Remove From List removes the nets selected in the Design Partition box or specified in the *Net Names* field from the nets list.

Remove All removes all the nets listed in the Design Partition box.

Save to Cellview saves the specified net filter to the cellview.

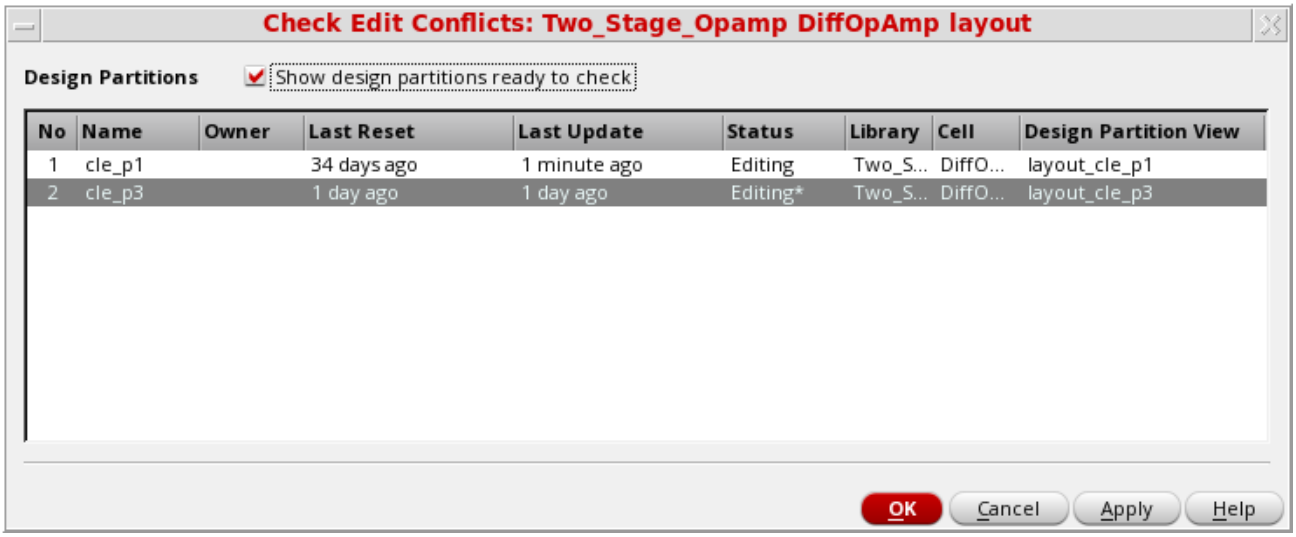
Load From Cellview loads the net filter from the cellview.

Delete From Cellview removes the selected net filter from the cellview.

Default applies the default net filters.

Apply saves and applies all updates.

Check Edit Conflicts



Use the **Check Edit Conflicts** form to conduct a more thorough checking among the selected design partitions and the top design to identify issues prior to merge. It can report edit conflicts undetected by the assistant alert system.

Show design partitions ready to check displays design partitions views that can be checked for edit conflicts. This option is selected by default, which means that design partitions with unmerged edits such as *Submitted*, *Editing*, and *Rejected* status are displayed. Status of empty design partitions view can be *Created*, *Merged*, *Reset*, and *Error*.

Design Partitions box lists the currently available design partitions.

Name specifies the name of the design partition.

Owner specifies the owner of the design partition. This information is not mandatory.

Last Reset shows when the partition was reset the last time.

Last Update shows when the partition was last updated.

Status specifies the current status of the design partition. Valid values are *Created*, *Editing*, *Submitted*, *Merged*, *Defined*, *Reset*, and *Rejected*.

Library specifies the name of library of the design partition view.

Cell specifies the cell name of the design partition view.

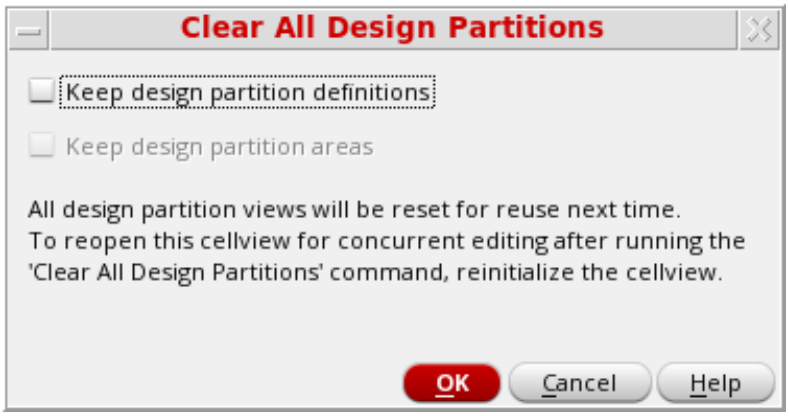
Design Partition View specifies the view name of the design partition view.

OK checks for edit conflicts, displays the *Edit Conflicts Summary* report, and closes the form.

Cancel closes the form without checking.

Apply checks for edit conflicts without closing the form.

Clear All Design Partitions



Use the **Clear All Design Partitions** form to remove the existing design partition views from the top design so the design can be edited without using Concurrent Layout. You are notified if any design partition view contains unmerged edits.

Keep design partition definitions lets you retain design partition definitions and areas attached to the design partitions when the *Clear All Design Partitions* command is run. This option is deselected by default, which means that design partition definitions are deleted when all design partitions are cleared.

Environment Variable: autoDeletePartitionView

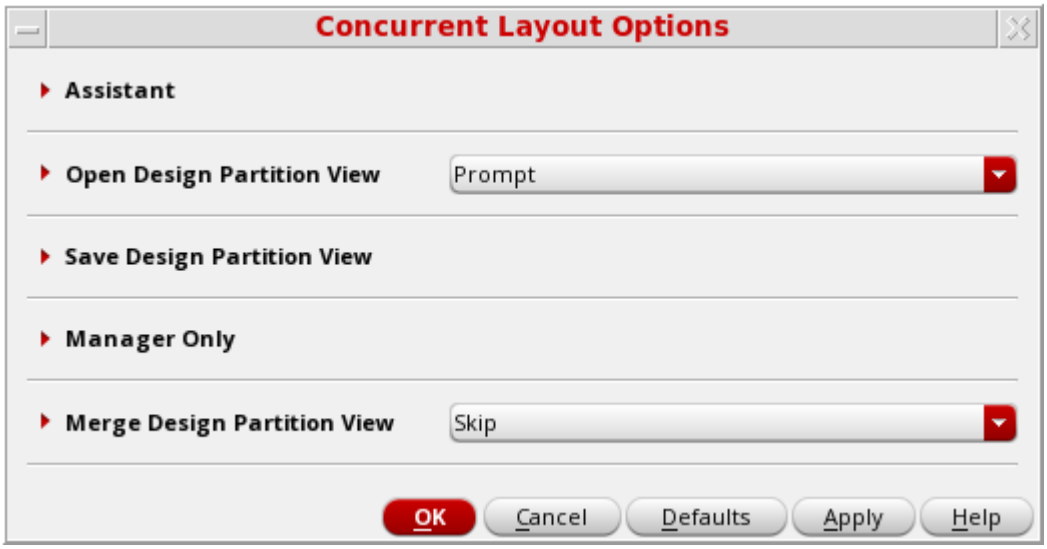
Keep design partition areas lets you retain the design partition areas created using Define Design Partition form. This option is deselected by default, which means that design partition areas are deleted when all design partitions are cleared. The option is enabled only when *Keep design partition definitions* option is selected.

Note: When design partition information is retained while clearing all design partitions, the information can be reused while creating new design partitions from the Define Design Partition form.

Create Area Boundary

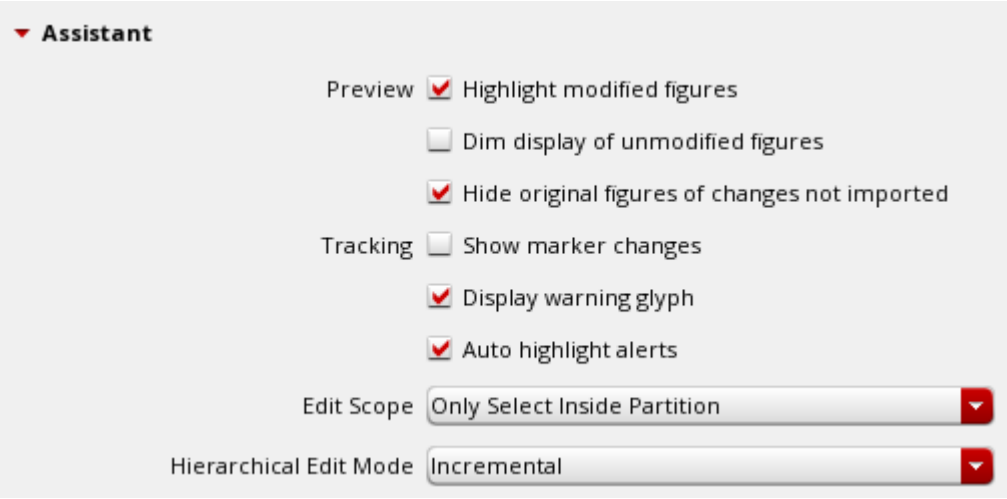
See Create Area Boundary.

Concurrent Layout Options



Use the **Concurrent Layout Options** form to modify the configuration settings related to the *Concurrent Layout* assistant and for opening, saving, and merging the design partition views.

The **Assistant** section provides options to customize the *Concurrent Layout* assistant. Expand each section to view related options.



Preview lets you specify the following preview options:

Highlight modified figures highlights all modified figures on the canvas. This option is selected by default.

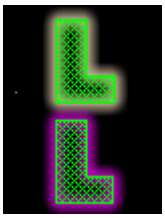
Environment variable: highlightModifiedFigPreview

Dim display of unmodified figures dims the display of the figures that have not been modified. This option is deselected by default.

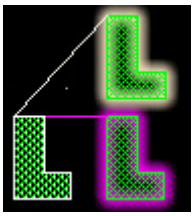
Environment variable: dimNotModifiedFigPreview

Hide original figures of changes not imported hides the original figures changed in the peer design partition, the changes are visible in preview, but are not imported. This option is selected by default, which means that in preview you will only see the modified shape because the original shape is hidden. If a shape is modified in more than one partition, in preview you will see several shapes without knowing whether there is an edit conflict. When this option is deselected, the original shape is also displayed along with a flightline pointing to the modified version so you can see an edit conflict.

The following example, shows difference in how the figures are displayed when this option is enabled or disabled.



When this option is selected, the relation between the two changes is not visible.



When this option is deselected, you can see how a figure was moved in two design partitions

Environment variable: hideOrignalFigPreview

The **Tracking** section provides options to configure the editing and alert information shown on the *Concurrent Layout* assistant and in the canvas.

Show marker changes displays the number of markers in the *Summary* pane and the marker details in the *Details* pane of the *Concurrent Layout* assistant. This option is deselected by default, which means that the markers are not displayed in the assistant.

Note: This option applies to the *OBJECTS* and *MODIFICATIONS* sections only. Markers in the *ALERTS* section are always displayed.

Environment variable: showMarkerChanges

Display warning glyph shows a yellow warning glyph in the canvas whenever a change is being made outside the design partition. Such changes increase the chance of edit conflicts and you may want to revert them immediately. Clicking on

the glyph will take you to the alert pane for more details. This option is selected by default and does not affect other types of glyph such as the red colored error glyph.

Environment variable: displayWarningGlyph

Auto highlight alerts highlights an alert automatically when it is added to the alert pane of Concurrent Layout assistant. This option is selected by default.

Environment variable: autoHighlightAlerts

Edit Scope sets the edit mode inside the current partition.

Off disables the edit mode settings.

Only Select Inside Partition lets you select only those objects that are inside the current partition. Objects that are fully or partially inside or have been temporarily moved outside the current partition for editing are also selectable.

Only Edit Inside Partition lets you edit only those objects that are inside current partition. When you specify this option, all edit commands are restricted to the specified design partition. You cannot edit objects outside this design partition.

Supported commands are: *Create – Shapes*, *Create – Instance*, *Create – Pin*, *Create – Label*, *Create – Fluid Guard Ring, Create – Wiring – Wire, Create – Via, Edit – Move, Edit – Copy, Edit – Stretch, Edit – Delete, Edit – Quick Align, Edit – Advanced – Reshape*.

Environment variable: cleEditMode

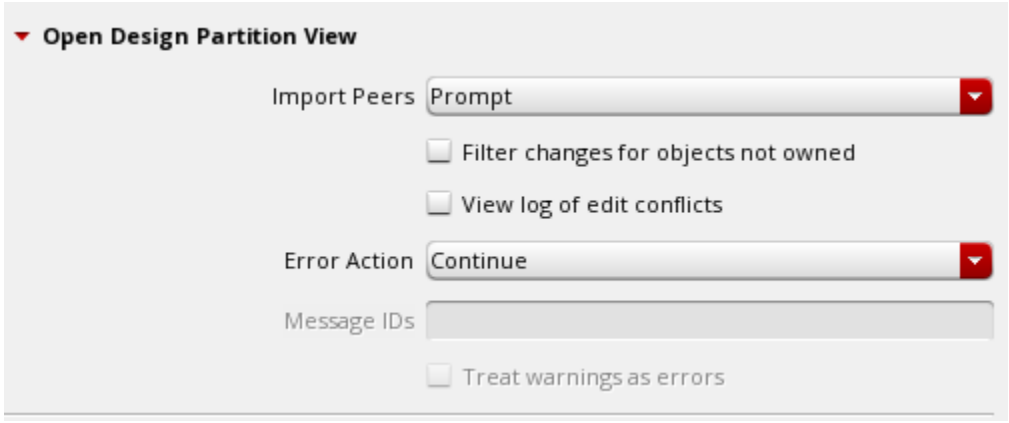
Hierarchical Edit Mode specifies the mode for hierarchal editing.

Regular disables the display of the Hierarchy Setup form and hierarchical editing is not done using concurrent layout.

Incremental displays the Hierarchy Setup form and lets you do hierarchical editing of area partitions using concurrent editing.

Environment variable: cleHierEditMode

The **Open Design Partition View** section provides options to configure the actions that occur when you open a design partition view.



Import Peers specifies actions to take when importing updates made in peer design partitions.

- **Prompt** displays a message to confirm whether you want to import updates made in peer design partitions.
- **Always** imports all peer partition updates.
- **Never** lets you work in isolation and the peer partition updates are never imported. You may still preview these changes in the foreground cellview.

  The default is *Prompt*.

  Environment variable: importPeerAtOpen

Filter changes for objects not owned filters updates to the objects you do not own. This option is applicable only for object-based partitions and is deselected by default.

Environment variable: importFilter

View log of edit conflicts specifies whether to display the log of edit conflicts while opening design partition views. This option is deselected by default, which means that the edit conflict log is not displayed when a design partition view opens.

Environment variable: importPeerViewLog

Error Action specifies the action to take when errors are found while opening a design partition view.

- ***Continue***
  The design partition view continues to open even in the case of error.

- ***Stop***
  Stops import of a design partition view in case of error.
- ***StopOnID***
  Stops import of a design partition view for the specified error message IDs.

  The default is *Continue*.

  Environment variable: importActionForError

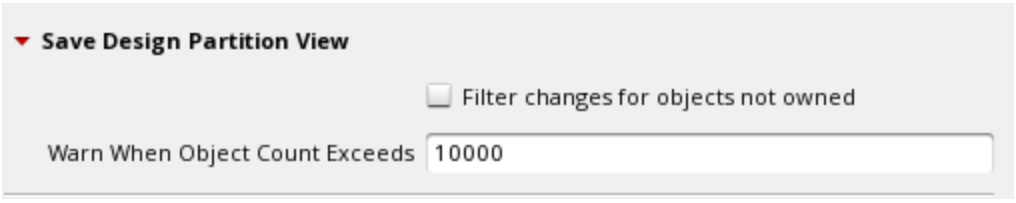
Message IDs specifies the error message IDs for which the import of a design partition view is stopped. This option is available only when the *Error Action* is specified as *StopOnID.*

Environment variable: importBlockErrorID

Treat warnings as errors increases the severity of warnings to the same level as errors so the specified error action can apply to them equally.

This option is available only when the *Error Action* is specified as *StopOnID.*

The **Save Design Partition View** section provides options to configure actions to take when saving a design partition view.



Filter changes for objects not owned specifies whether to filter changes for objects that the user does not own while saving a design partition view. This option is applicable only for object-based partitions.

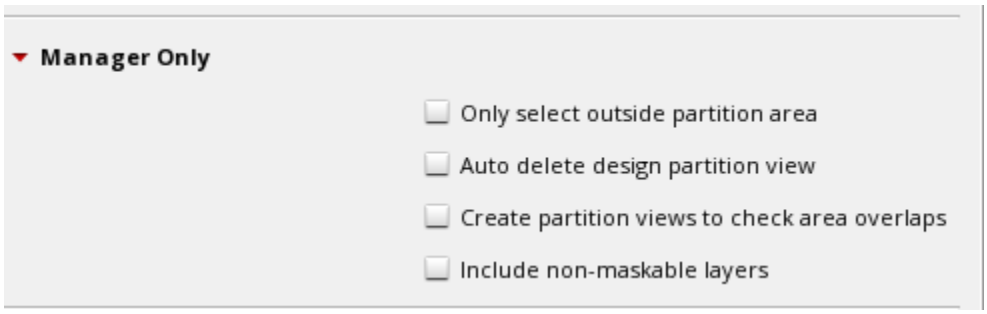
This option is deselected by default, which means that the changes made to the objects not owned by the user are not filtered and are saved in the design partition view.

Environment variable: exportFilter

Warn when Object Count Exceeds displays a warning to merge the design partition view when the number of objects being modified in the design partition view exceeds the specified value. You can disable this warning by setting the value to `0`.

Environment variable: mergeSizeReminder

The **Manager Only** section provides options that can be set in the manager mode.



Only select outside partition area specifies whether edits in manager mode should be allowed only outside design partition areas. The check box is deselected by default, which means that users can edit the top design from inside any design partition area. When selected, users cannot edit any object inside design partition area.

Environment variable: onlySelectOutsidePartition

Auto delete design partition view deletes design partition views when *Clear All Design Partitions* or *Delete* command is run. When deselected, the design partition views are reset to be reused when these commands are run. The check box is deselected by default.

Environment variable: autoDeletePartitionView

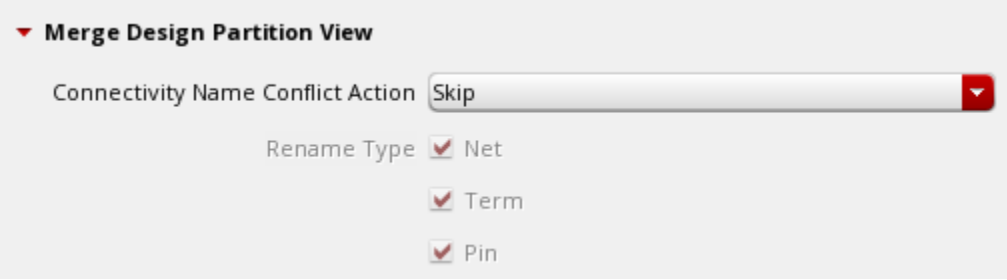
Create partition views to check area overlaps when *Create* is clicked on the Define Design Partition form, checks design partitions for area overlaps and reports them in CIW. The check box is deselected by default.

Environment variable: createPartcheckAreaOverlap

- **Include non-maskable layers** adds the non-maskable layer column on the Partition Layers form and lets you can include non-maskable layers in layer-based design partitions.

  Environment variable: includeNonMaskableLayers

The **Merge Design Partition View** section provides options to configure the actions that occur when you merge a design partition view.



Connectivity Name Conflict Action specifies the action to take when conflicts are found while merging design partition views. This option is used to resolve issues with connectivity objects with duplicate names.

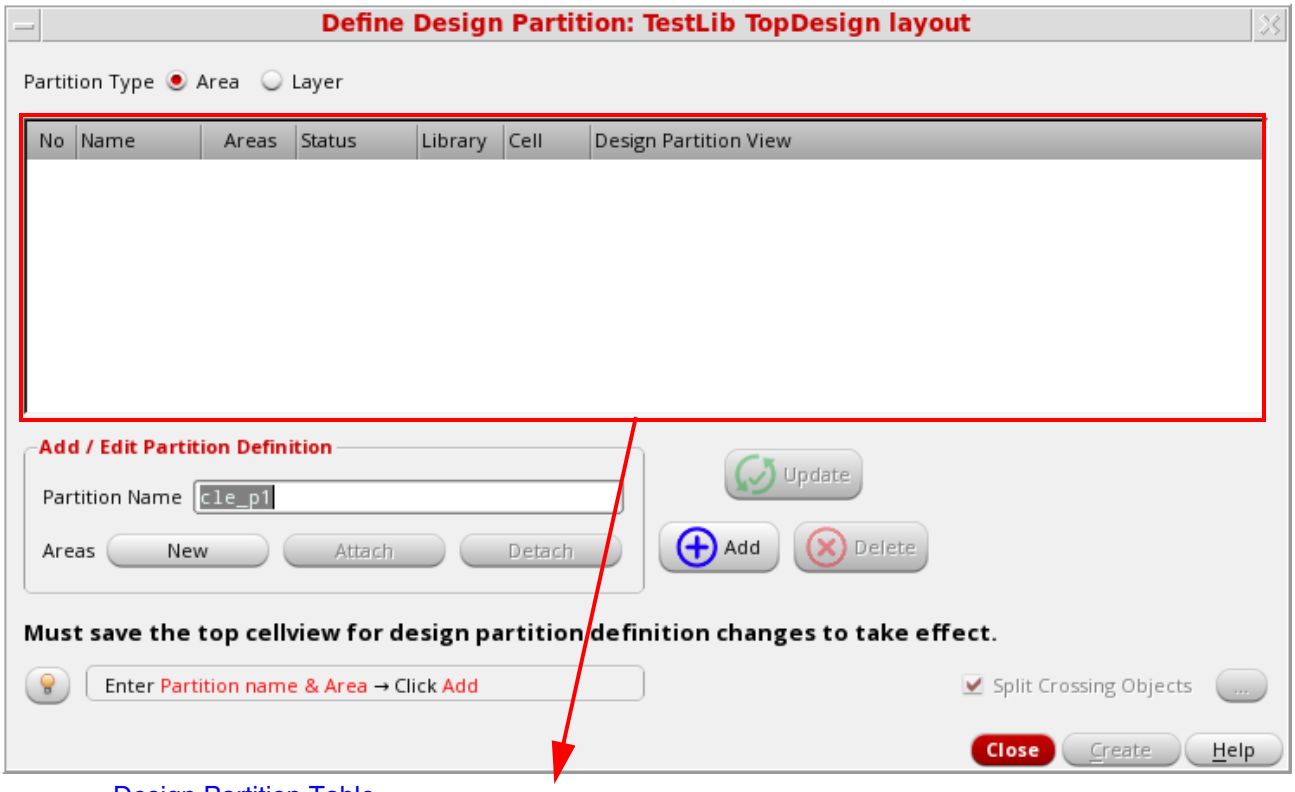
- ***Skip***
  Merges the first object and skips the next object.
- ***Replace***
  The second object replaces the previous or the first object.
- ***Rename***
  Renames the second object and retains both. You can set this option for **Net**, **Term**, and **Pin** by selecting the respective check boxes.

  Environment variable: conflictRenameNet, conflictRenamePin, conflictRenameTerm
- ***Error***
  An error is reported when duplicate entries are found.

The default is *Skip*.

Environment variable: conflictMergeAction

Define Design Partition



Design Partition Table

Use the **Define Design Partition** form to add design partitions, create area boundaries or specify a top/bottom layer range, and attach areas, objects, and nets to the selected design partition.

Partition Type specifies the type of design partition to create for concurrent layout editing.

Area creates area-based design partitions.

Layer creates layer-based design partitions.

Important

You cannot define both type of design partitions in the same concurrent layout editing environment.

The following options are available when you set *Partition Type* to *Area*.

The **Design Partitions** table displays the details of the currently defined or newly added design partitions.

Note: Click on a design partition to select it and then perform additional tasks related to it. To deselect a design partition, either click in an empty area or Ctrl +click on the selected design partition.

Selecting a design partition will highlight the attached areas, highlight the bounding box of attached objects, and probe the attached nets in the Navigator. This helps in identifying attached objects.

Name specifies the name of the design partition.

Areas summarizes the number of areas attached to the design partition.

Objects summarizes the number of objects attached to the design partition. The count also includes invisible objects.

This column is available only when an object-based partition exists or if cleEnableAdvPartitionType is set to `t`.

Nets summarizes the number of nets attached to the design partition.

This column is available only when an net-based partition exists or if cleEnableAdvPartitionType is set to `t`.

Status specifies the current status of the design partition. Valid values are *Created*, *Not Submitted*, *Submitted*, *Reuse*, *Merged*, *Defined*, *Reset*, and *Rejected*.

The status, *Reuse*, is used for retired design partitions that can be used create new design partitions.

Library specifies the name of library of the design partition view.

Cell specifies the cell name of the design partition view.

Design Partition View specifies the view name of the design partition view.

Partition Name displays the name for the selected design partition. You can also type in a different name.

Add adds a default design partition named with the value specified in *Partition Name*. When the design partition is selected, you can change the value in *Partition Name* and then click *Update* to apply the change.

Update lets you update the selected design partition view with a new name specified in *Partition Name*, or updates the changes made to area boundaries.

Delete removes the selected design partition and all associated design partition views in the hierarchy. When you select this option, a message is displayed to confirm the deletion of the listed top and hierarchical design partition views. An indicator (*) is used

to identify the design partition views with unmerged changes. Changes in these design partition views are lost if you continue to delete the design partition.

Areas lets you create new area boundaries and attach or detach selected area boundaries from the selected design partition. For more information on creating area boundaries, see Create Area Boundary.

New lets you create a new area partition in the canvas.

Note: If you select a design partition and click the *New* button to create area boundaries on the canvas, the area boundaries are attached to the selected design partition when you click *Update*.

Attach lets you attach preselected area boundaries on the canvas. You can also click the *Attach* button and then select area boundaries on the canvas to attach. For further assistance, press `F3` to display the Attach / Detach Areas form.

Detach lets you detach preselected area boundaries on canvas. You can also click the *Detach* button and then select area boundaries on the canvas to detach. For further assistance, press `F3` to display the Attach / Detach Areas form.

Note: Click *Update* after you have completed the changes to apply these changes on area boundaries to the selected design partition.

Objects lets you select objects to attach or detach from the selected design partition.

Attach lets you attach preselected objects on canvas. You can also click the *Attach* button and then select objects on the canvas to attach. For further assistance, press `F3` to display the Attach / Detach Objects form.

Detach lets you detach preselected objects on canvas. You can also click the *Detach* button and then select objects on the canvas to detach. For further assistance, press `F3` to display the Attach / Detach Objects form.

Select lets you select objects to perform additional tasks, such as *Fit to Selected*.

Note: This column is available only when an object-based partition exists or if cleEnableAdvPartitionType is set to `t`.

Here, objects are not limited to shapes and instances. They can also be a container, such as a figure group or a route. The partition can be adjusted at any time. However, a modified object is locked to its partition until the change is merged with the top design.

Nets lets you select nets to attach or detach from the selected design partition.

Attach lets you attach preselected nets from the *Navigator*. You can also click the *Attach* button and then select nets from the *Navigator* to attach. For further assistance, press `F3` to display the Attach / Detach Nets form.

Detach lets you detach preselected nets from the *Navigator*. You can also click the *Detach* button and then select nets from the *Navigator* to detach. For further assistance, press `F3` to display the Attach / Detach Nets form.

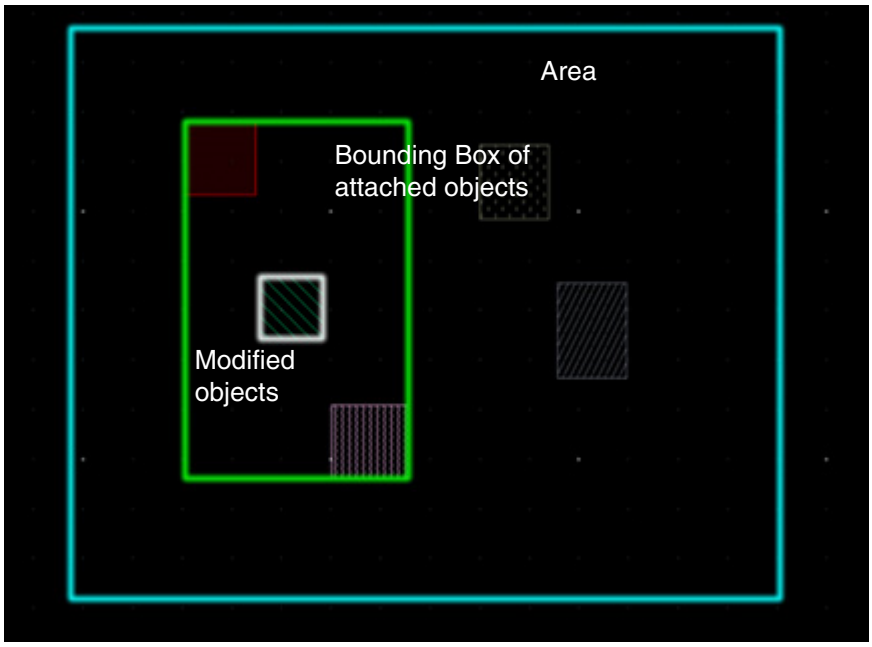
Select lets you select objects to perform additional tasks, such as *Fit to Selected*. For further assistance, press `F3` to display the Select Net form.

Note: This column is available only when an net-based partition exists or if cleEnableAdvPartitionType is set to `t`.

To highlight the design partition under selection while adjusting its definition and to prevent users from touching modified objects while using the *Attach* and *Detach* commands, colors are used to identify the following objects.

- Areas: Light blue
- The bounding box of attached objects: Green
- Modified objects: White

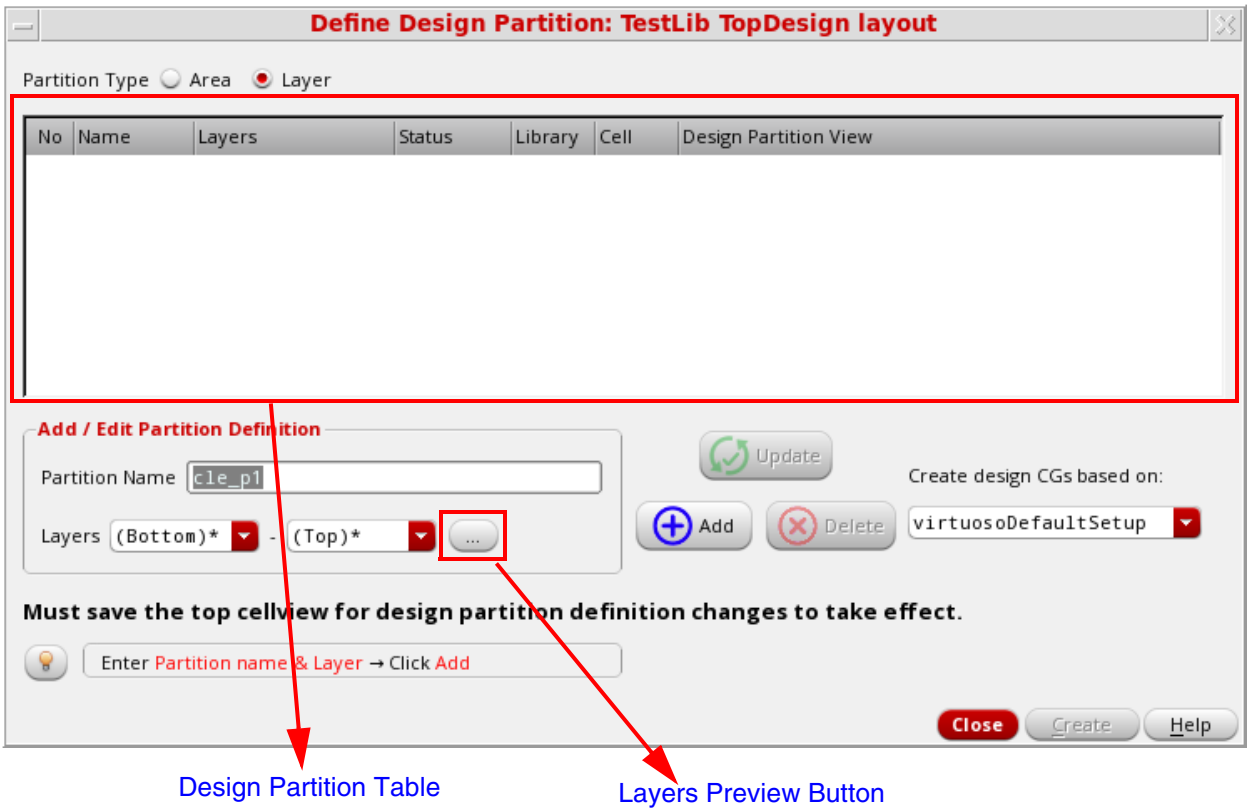
The following screenshot shows different colors used to highlight modified objects.



Split Crossing Objects automatically splits path segments when a partition view is created. This option is selected by default.

Select the button next to this option to display the Split Crossing Objects Options form that lets you specify how objects that are part of multiple design partitions are split across design partitions.

The following options are available when you set *Partition Type* to *Layer*.



The **Design Partitions** table displays the details of the currently defined or newly added layer-based design partitions.

Note: To select a design partition and perform additional tasks, click it in the design partition table. To deselect a design partition, either click in an empty area or Ctrl+click the selected design partition.

Name specifies the name of the design partition.

Layers displays the top and bottom layer range for each design partition.

Status specifies the current status of the design partition. Valid values are *Created*, *Not Submitted*, *Submitted*, *Reuse*, *Merged*, *Defined*, *Reset*, and *Rejected*.

Note: The status, *Reuse*, is used for retired design partitions that can be used create new design partitions.

Library specifies the name of library of the design partition view.

Cell specifies the cell name of the design partition view.

Design Partition View specifies the view name of the design partition view.

Partition Name displays the name for the selected design partition. You can also type in a different name.

Add adds the default design partition named with the value specified in *Partition Name*. When the design partition is selected, you can change the value in *Partition Name* and then click *Update* to apply the change.

Update lets you update the selected design partition view with a new name specified in *Partition Name*, or update the top/bottom layer range specified using *Layers* drop-box lists.

Delete removes the selected design partition and all associated design partition views in the hierarchy. When you select this option, a message is displayed to confirm the deletion of the listed top and hierarchical design partition views. An indicator (*) is used to identify the design partition views with unmerged changes. Changes in these design partition views are lost if you continue to delete the design partition.

Layers specifies the range of layers to be included in a design partition. You can use the drop-down lists to specify the top and bottom layers. You can click the *Layers Preview* button to display the Partition Layers form. This form lets you select the layers you want to keep in the design partition. You can also use this from to import other visible layers from the *Palette*.

Create design CGs based on specifies the parent constraint group based on which all the Concurrent Layout wire design constraint groups for different layer-based design partitions will be created. The Concurrent Layout wire design constraint groups assist in routing and interactive wire editing, and help you limit the editing only to those layers that are part of the current layer-based design partition.

All Concurrent Layout wire design constraint groups inherit the same parent constraint group between the top cell and corresponding subcells. If you want to rebase the parent constraint group, all these wire design constraint groups will be rebuilt for the top cell and all its subcells.

Hint provides information regarding the next step.

Close exits the Define Design Partition form without saving any changes.

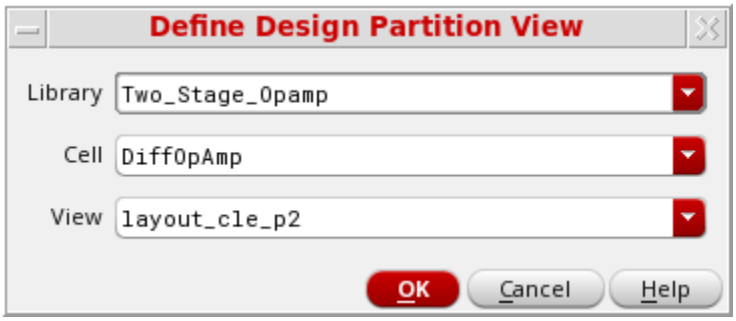
Create performs the following:

- Creates design partition view if status is *Defined.*

- Resets design partition view if status is *Reuse*.
- Creates two types of Concurrent Layout constraint groups dedicated to each design partition are created in order to enable layer constraints. For more information, see Editing in a Layer-Based Design Partition.
- Saves the top design with new definitions.

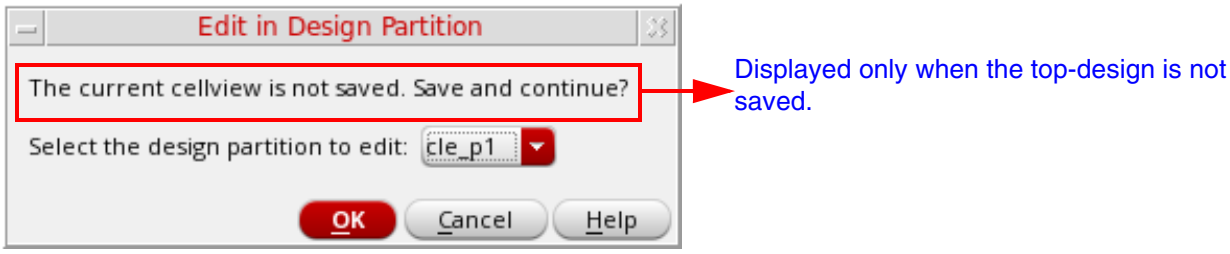
  Note: This option is enabled only when new design partitions are defined.

Define Design Partition View



Use the **Define Design Partition View** form to specify the **Library**, **Cell**, and **View** for the associated design partition view. By default, it will be created under the same cell as the top design and the view is named after the design partition name. The manager must have write permission to either create this cellview or reuse it.

Edit in Design Partition

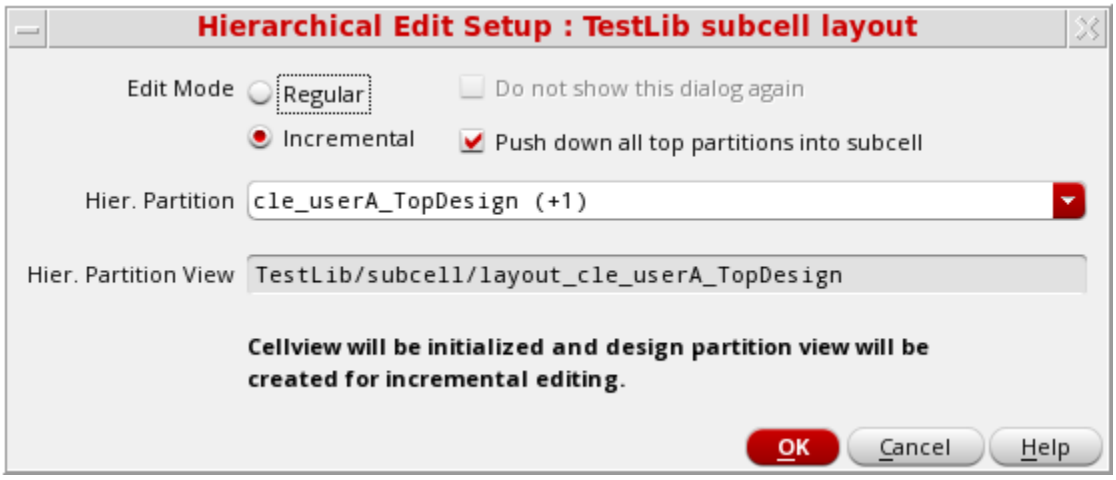


Use the **Edit in Design Partition** form to edit in a selected design partition view.

Select the design partition to edit dropdown list lets you select the design partition you want to start editing.

Note: If the top design is not saved, the Edit In Design Partition form displays a message informing you about it, and you are asked whether you want to save it before switching to the design partition editing.

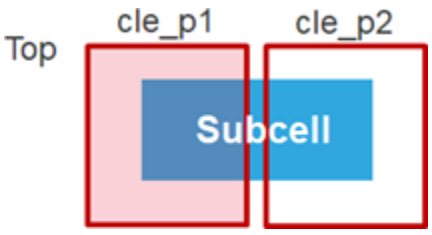
Hierarchical Edit Setup Form



Use the Hierarchical Edit Setup form to perform incremental Edit In Place (EIP) and save the changes to a design partition view in the sub hierarchy.

This form is displayed in Designer mode when you *Descend Edit or Edit In Place* into a subcell and the following conditions are all met:

- Top-level design partitions are area-based
- The subcell straddles two or more design partitions
- There is only one occurrence of this subcell in the top design (for performance reason, checking is performed only to the display level or minimum 3).



Edit Mode specifies the editing mode in which the hierarchy opens the configuration.

Regular opens a design in regular mode. All updates are saved in the subcell. In this mode, Concurrent Layout assistant is disabled.

Do not show this dialog again prevents the Hierarchy Setup dialog box from being displayed next time your hierarchical editing.

Incremental opens the design in incremental mode. Incremental EIP postpones an update in the sub-hierarchy until it is verified in all designs referencing it. This is the default. After you return to top and save the design, this choice is remembered so that you do not have to choose it again the next time.

Push down partition into subcell pushes the area boundaries of the top-level design partition into subcell. This option is available only in *Incremental* edit mode.

Design Partition specifies the hierarchical design partition name. The naming rule is `cle_<top_level_design_partition_name>_<top_cell_name>`. For example, it will be cle_p1_Top for the design partition `cle_p1` of the top design Top. This option is available only in *Incremental* edit mode.

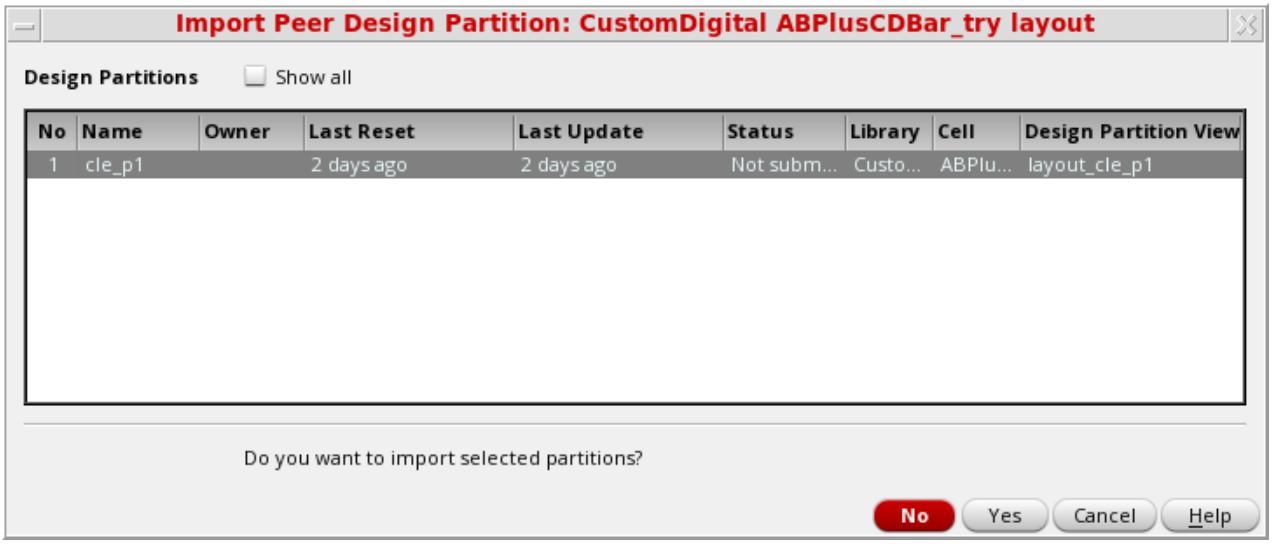
Design Partition View is the hier. design partition view to be applied to the sub cell. The configurations are stored in top-level design partition view and are automatically loaded during open or Import Peer Design Partition. You can view the configuration in the Layout Configuration form, which is available in both Designer and Manager mode. After they are loaded, the changes are applied to all occurrences of this subcell which can be outside of the current design partition. This option is available only for Incremental edit mode.

Deleting a configuration just unloads the hier. design partition view while incremental changes are still retained in the sub-hierarchy.

Note: Merging at the top design is easy because merging a parent top-level design partition automatically loads the children heir. design partitions into memory. Additionally, committing the top design recursively merges the children hier. design partition views into subcells and commit.

OK initializes the cellview for incremental editing.

Import Peer Design Partition



Use the **Import Peer Design Partition** form to import updates made by peer designers in their respective design partitions. When you open the form, partitions available for import are already selected.

Note: All new and edited wires are locked after they are imported in the current design partition.

Design Partitions displays the peer design partitions you can import.

> **Show all** lists all peer design partitions. This check box is deselected by default, which means that only design partitions with unmerged edits are displayed.

You can view the following details of the design partitions.

> **Name** shows the name of the design partition.
>
> **Owner** displays the name of the user who owns the design partition.
>
> **Last Reset** shows when the partition was reset the last time.
>
> **Last Update** shows when the partition was last updated.
>
> **Status** shows the current status of the partition. Valid values are *Defined*, *Created*, *Editing*, Submitted, *Rejected*, *Merged*, and *Reset*. Design partitions can be imported if their status is *Editing*, *Submitted*, or *Rejected*.
>
> **Library** in which the design partition is located.

Cell in which the design partition view has been created.

Design Partition View displays the view name of the design partition view.

Import Peers on Next Open specifies the action to take when the design partition is opened the next time.

Select **Prompt** to display a message to confirm whether you want to import updates made in peer design partitions.

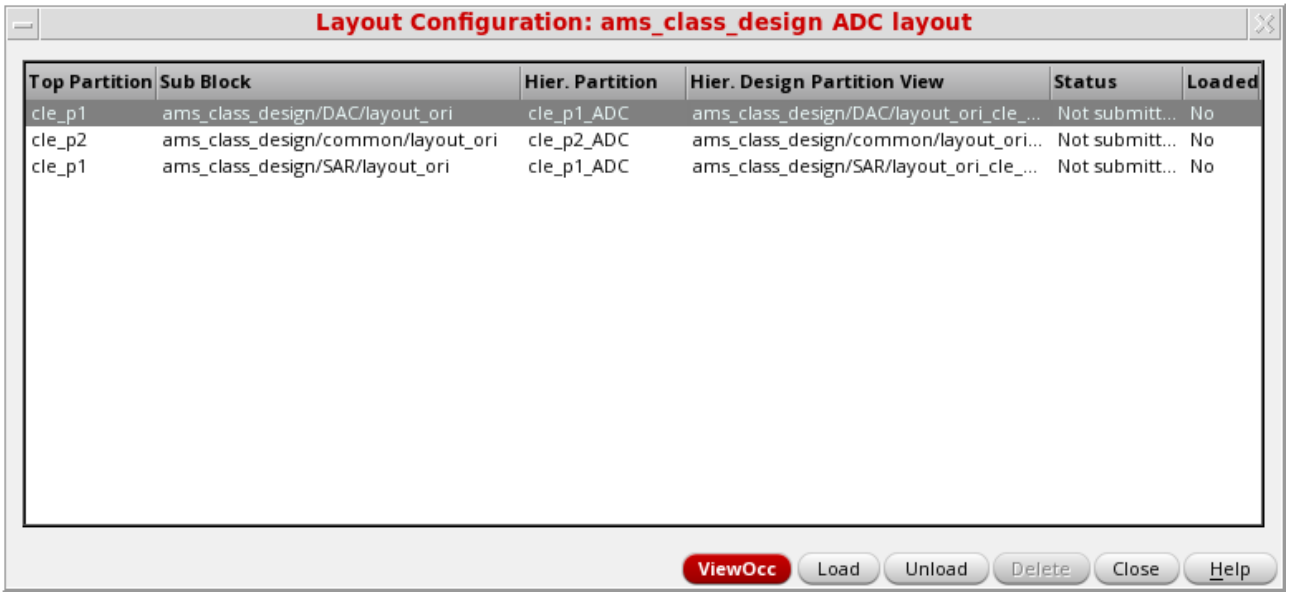
Select **Always** to always import updates made in peer design partitions.

Select **Never** to never import any updates made in peer design partitions.

Yes imports the peer partition. This option is available only when you select a partition to import.

No exists the form without importing any peer partitions.

Layout Configuration



Use the **Layout Configuration** form to load or unload layout configurations saved in a hierarchical design partition view. The loaded layout configuration is applied to the specified sub-hierarchy. Layout configurations can be inherited from a peer partition but they cannot be recursively inherited from the sub-hierarchy.

Top Partition displays the name of the top partition.

Sub Block displays the name of the sub-block associated with the top partition.

Hier. Partition displays the sub-partition for editing-in-place.

Hier. Design Partition View displays the name of the design partition view associated with the layout configuration.

Status displays the current status of the layout configuration. Valid values are *Editing*, *Peer, Init*, and *Inbound***.**

Loaded shows whether the current layout configuration is loaded.

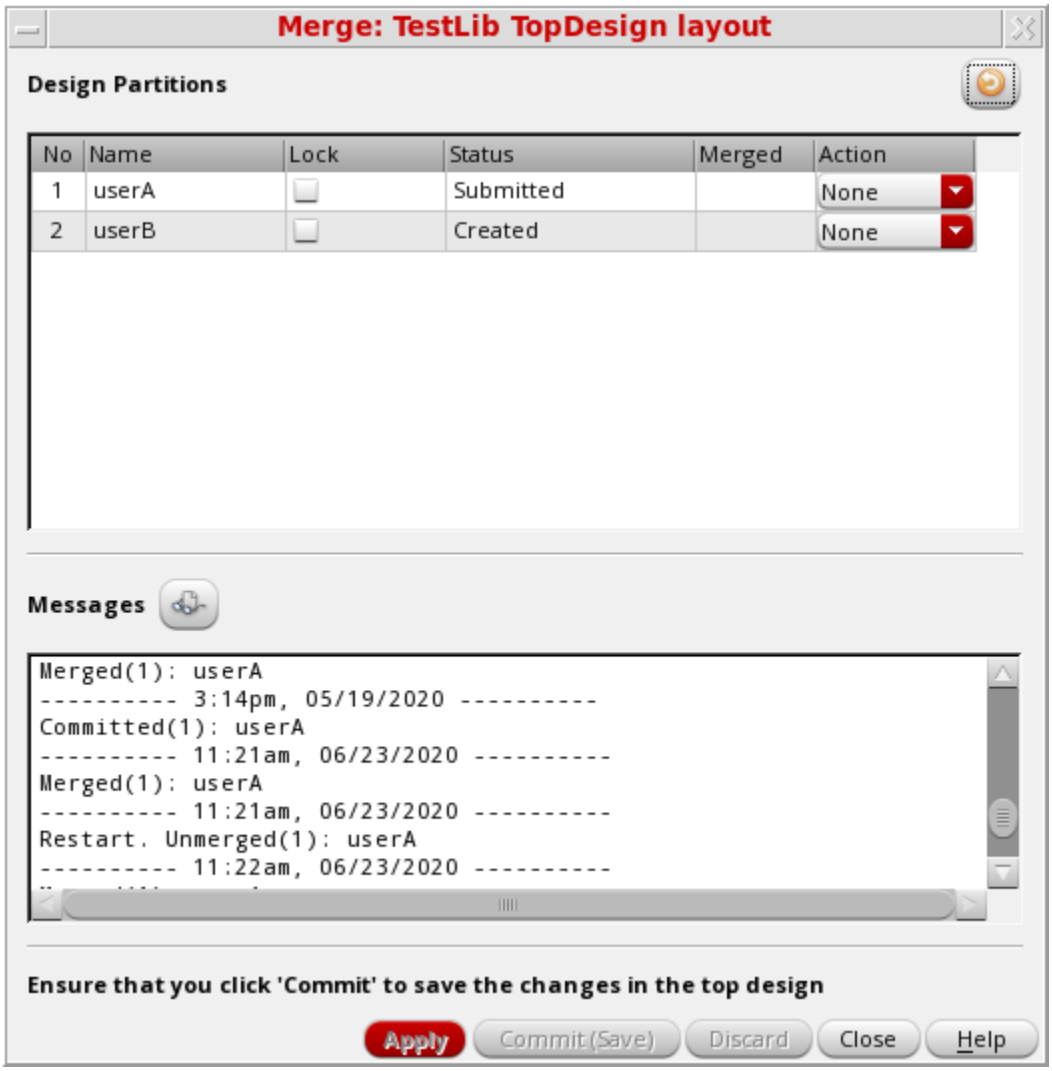
Viewocc displays that View Instance Occurrence form in which occurrences up to display t level three are displayed. Minimum value is 3.

Load lets you load the selected layout configuration.

Unload lets you unload the selected layout configuration.

Delete lets you delete the layout configurations that are not inherited.

Merge



Use the **Merge** form to merge or reject the design partition views submitted to be merged with the top design.

Refresh lets you refresh the list of design partitions available for merge and their current states. The option refreshes all information related to these partitions, such as Lock, and Status along with current states.

Design Partitions displays the peer design partitions.

You can view the following details of the design partitions you can merge.

Name shows the name of the design partition.

Lock shows the name of the user that has locked the design partition view. If this check box is selected, it means that the user has locked the partition.

You can lock a selected design partition by selecting the check box if it is currently deselected. When you deselect the check box for a locked design partition you own, it is unlocked.

Status shows the current status of the partition. Valid values are *Defined*, *Created*, *Editing*, *Submitted*, *Not Submitted*, *Rejected*, *Merging*, *Merged*, and *Reset*.

Merged indicates whether the design partition view has been merged with the top design. If the field shows *yes* it means that the partition has been merged.

Action lets you choose one of the following actions for the selected design partition. The action is executed when you click the *Apply* button.

- **Merge** merges the selected partition.
- **Unmerge** undoes the merge action.
- **Remerge** merges the selected design partition again.
- **Reject** rejects the request to merge the selected design partition.
- **None**

Click in the Action column of a design partition to view the list of actions. You can apply actions to multiple selected partitions.

Note: You can select one or more design partitions and use the RMB menu to lock/unlock design partition views, choose an action, or open the Layout Configuration form.

Message box displays the messages generated during the merge process. These messages provide you with more information related to the actions completed or issues faced during the merge process.

Apply applies the settings specified in the merge form.

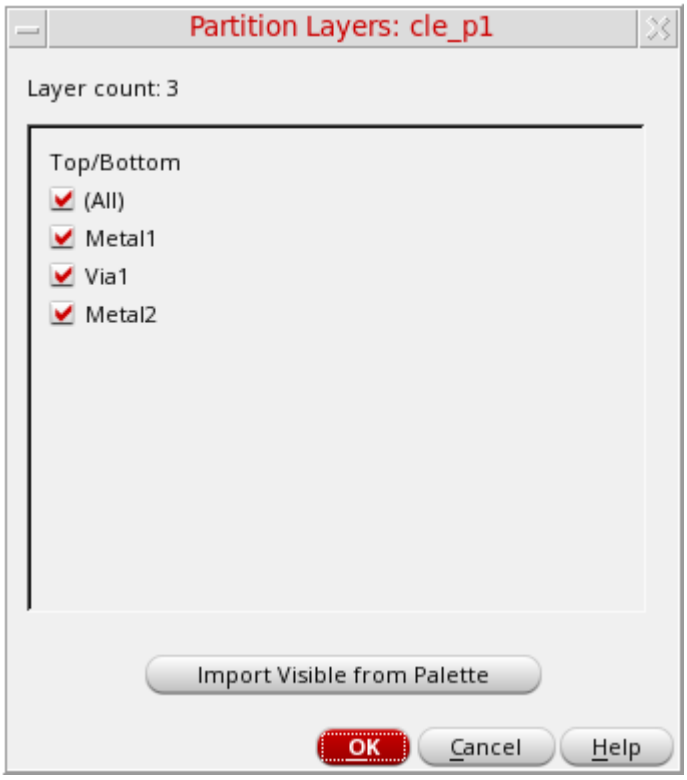
Commit (Save) saves the merged partition to the top design.

Note: When you commit your changes, a *Commit (Save) Failed* message is displayed to inform you about any issues that might exist and can cause issue during or after merge.

Discard discards the edits done in the current cellview and restores it from the disk.

Close exists the Merge form without saving any changes.

Partition Layers



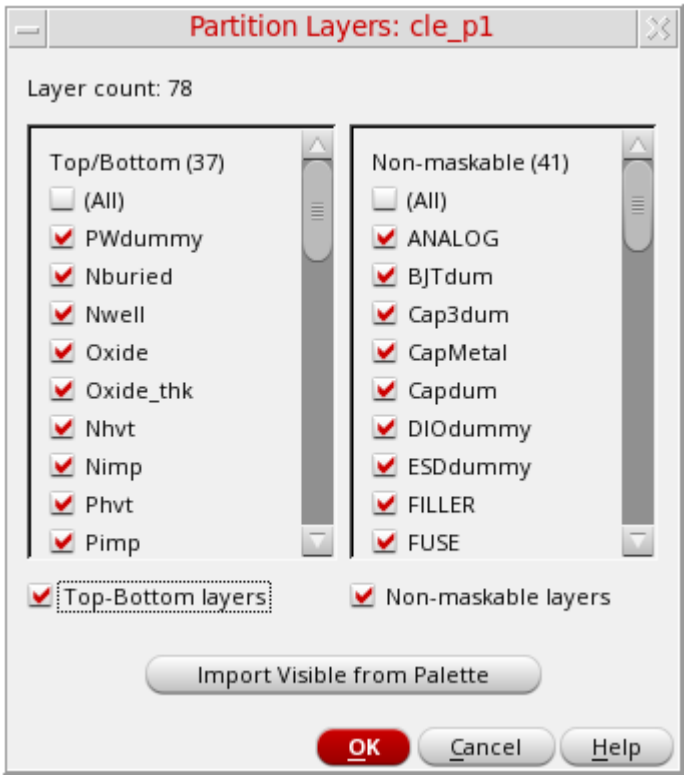
Managers can use the **Partition Layers** form to preview the layers included in the selected layer-based design partition.

Layer count specifies the number of layers included in the design partition. The layers added to the design partition are listed. You can clear the check boxes for the layers that you do not want to include in the design partition.

Import Visible from Palette incrementally adds visible layers displayed in the Palette.

When the *Include non-maskable layers* option is selected in the Concurrent Layout Options form, a column for non-maskable layers is added in the Partition Layers form. This

column lists the non-maskable layers. You can deselect the layers you do not want to add to the design partition.



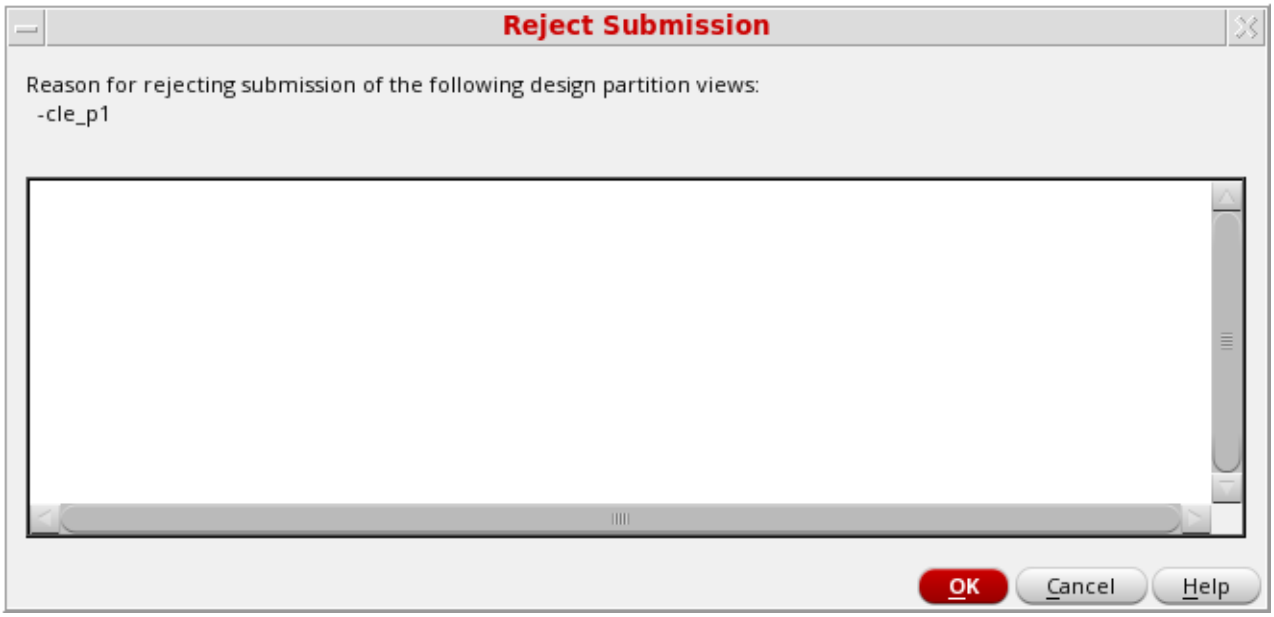
Top-Bottom layers

If selected, incrementally adds visible and maskable layers displayed in the Palette when the click *Import Visible from Palette* is clicked.

Non-maskable layers

If selected, incrementally adds visible and non-maskable layers displayed in the Palette when the click *Import Visible from Palette* is clicked.

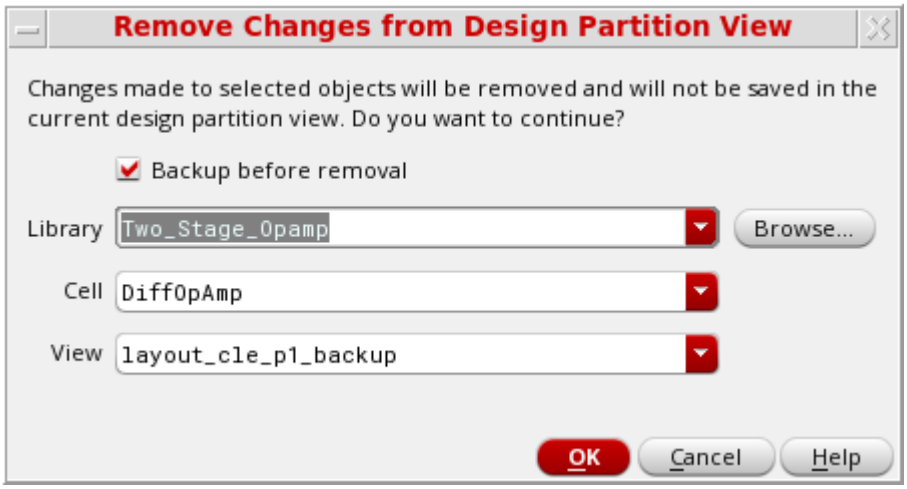
Reject Submission



Managers can use the **Reject Submission** form to reject a design partition view submitted by a designer to be merged with the top design. If the design partition status is *Merging*, undo the changes until the status changes back to *Submitted* and then reject it.

Managers can provide the reason for rejection in the text box provided and then click the **OK** button.

Remove Changes from Design Partition View



Use the **Remove Changes from Design Partition View** form to remove changes on the specified objects from the current design partition view. To specify an object, simply set the filter state next to it on the *Concurrent Layout* assistant.

A designer can use this form to remove simple changes on selected objects from the current design partition view. A change is simple, if it involves only one object. For example, stretching an MPP is not simple as it involves several shapes; in such cases, Concurrent Layout does not search for the additional changes that are needed to be removed together, so you might get a partial result.

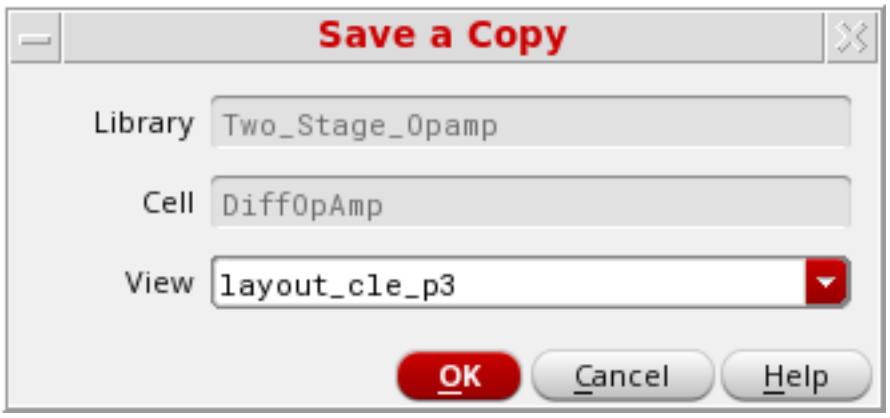
Note: To revert the changes you removed using this form, open the backup file and use the *Save As* command to replace the design partition view. The backup retains all the filter state settings.

If you are a manager and want to exclude an update from merge, you can switch your role to a designer, remove it from the design partition view and submit for merge.

Backup before removal specifies whether a backup file should be created for the objects being removed. Cadence recommends that you enable this feature because undoing the changes might not be simple.

Type in or browse to specify the **Library**, **Cell** and **View** name of the cellview where you want to save the backup information.

Save a Copy



Use the **Save a Copy** form to save a copy of your design partition view.

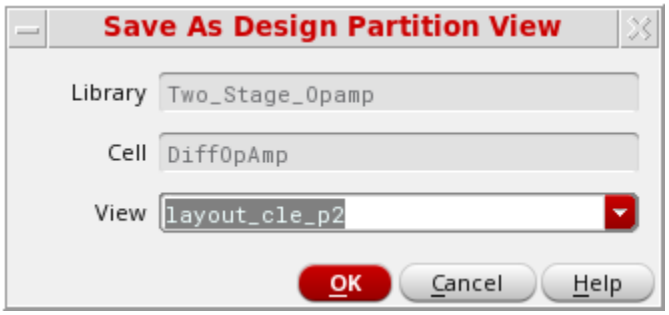
In Layout XL or Layout EXL window, select *File – Save a Copy* to display this form. When you open this form in designer mode of Concurrent Layout, it overrides the default layout Save a Copy form.

Library specifies the name of library of the design partition.

Cell specifies the top cell name of the design partition.

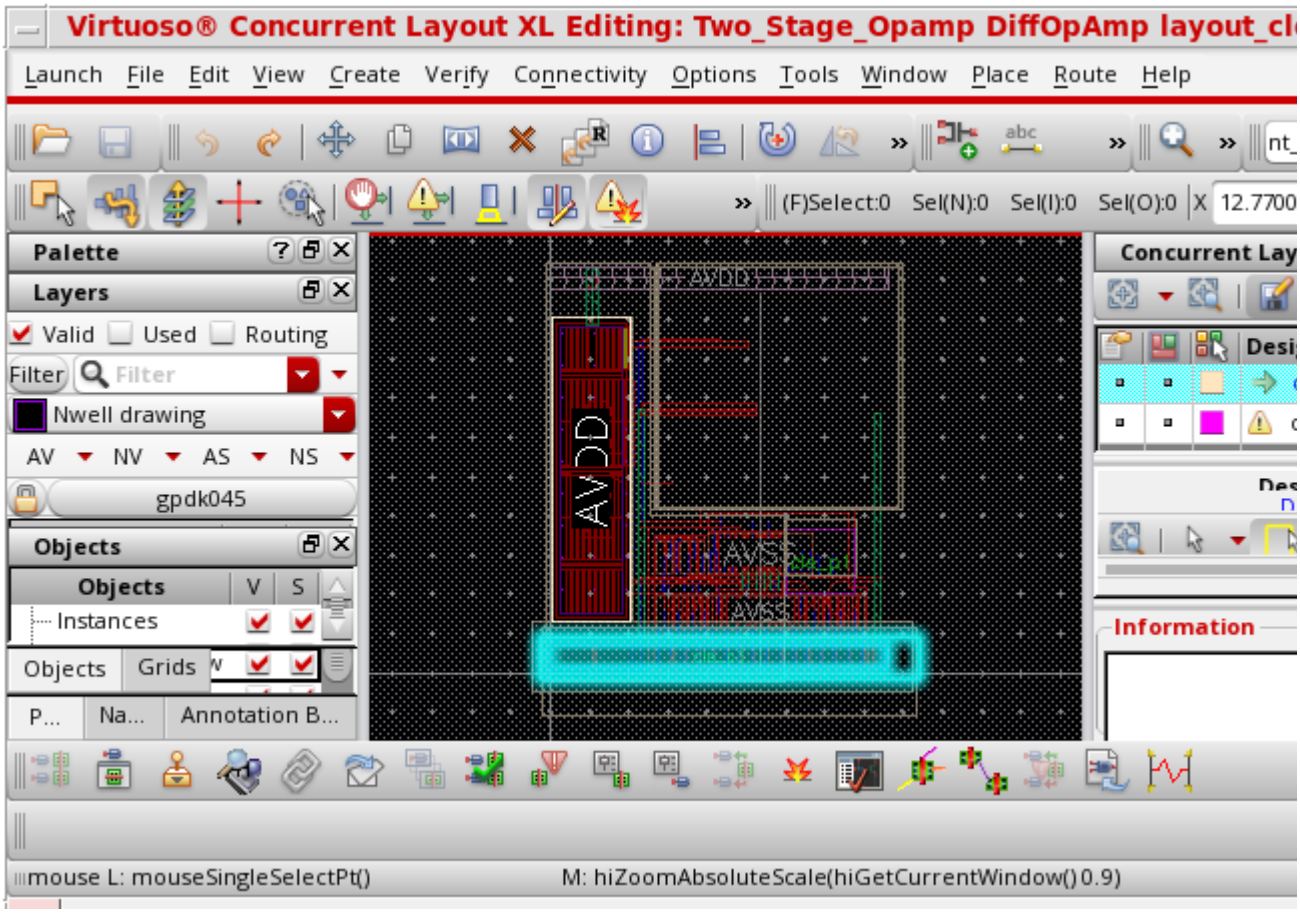
View specifies the view name of the design partition.

Save as Design Partition View



Use **the Save As Design Partition View** form to save your updates only for the specified design partition view.

The option to open this form is available only when you open the cellview in full design view. Full design view of a design partition can be saved using the Save As Full Partition View form.

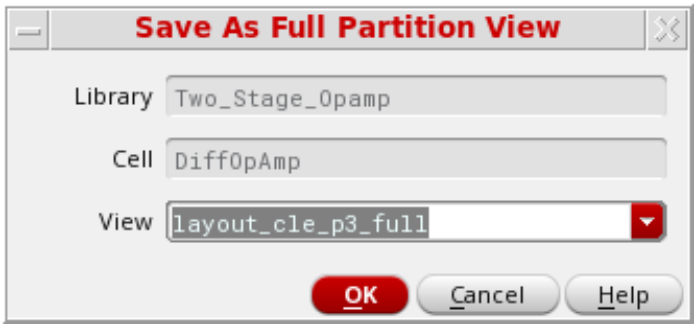


Library specifies the name of library of the design partition.

Cell specifies the top cell name of the design partition.

View specifies the design partition view name of the design partition.

Save As Full Partition View



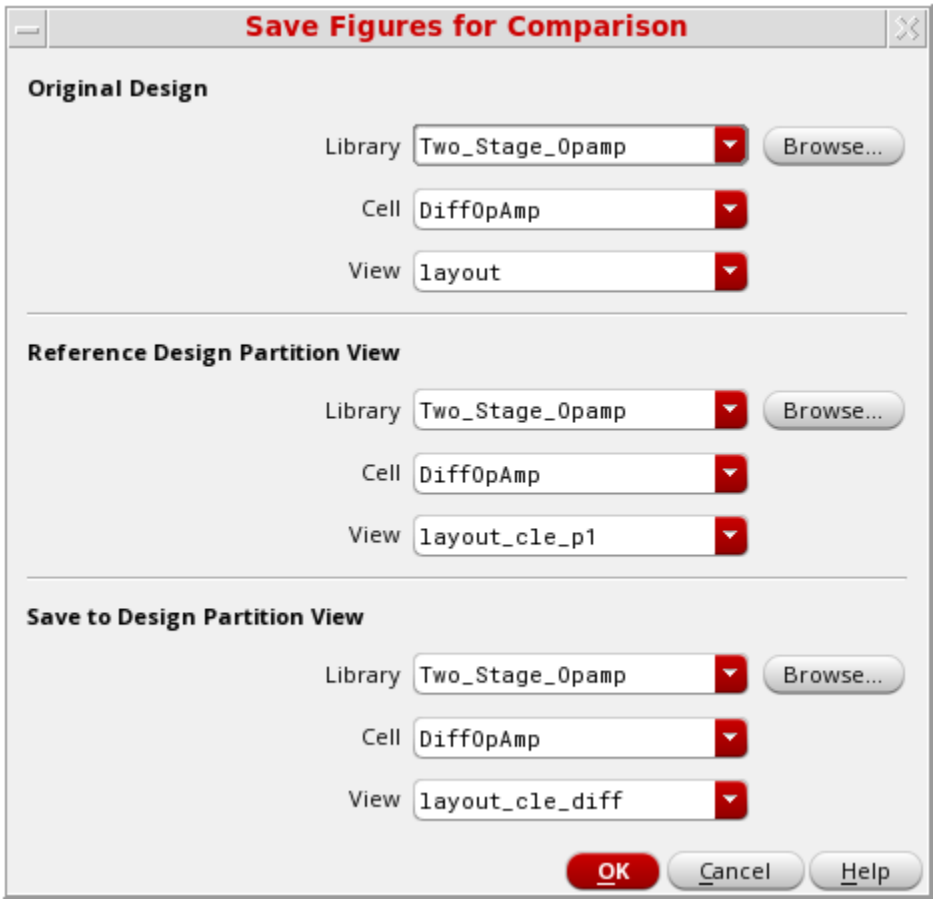
Use the **Save As Full Partition View** to save the full design partition view of the specified cellview.

Saving several changes in a specific design partition view can slow down the open and save processes. Cadence recommends merging the design partition views periodically, ideally not exceeding 10,000 changes per save. You can also speed up the save process by saving as a full partition view.

Another benefit of saving a full partition view is for tools that cannot read directly from the memory. Saving as a full partition view with all changes allows these tools to read the cellview as a regular cellview.

Type in the **Library**, **Cell**, and full partition **View** name of the cellview where you want to save the design as a full partition view.

Save Figures for Comparison



Use the **Save Figures for Comparison** form to:

- Save those figures from the original design (for example, `Two_Stage_Opamp/DiffOpAmp/Layout`) that have been modified in the reference design partition view to another design partition view (for example, `Two_Stage_Opamp/DiffOpAmp/layout_cle_p1`).
- Save the original and unmodified versions of the figures from the original design, in a *`cle_diff`* partition view (for example, `Two_Stage_Opamp/DiffOpAmp/layout_cle_diff`). *`cle_diff`* retains the original state of these figures before they were modified in the reference design partition view.

If the top design is modified and causes conflicts, you can preview the unmodified figures in the saved `cle_diff` partition by using the *Synchronized Preview* command in *Concurrent Layout* assistant.

For example, if a changed object is deleted in the top design it will lead to edit conflicts. In this case to sign off the conflict, you might want to check how the design looked originally before the change. You can use the *Save Figures for Comparison* command to preview the original figure for reference.

Original Design specifies the original cellview.

Type in or browse to specify the **Library**, **Cell**, and **View** name of the original cellview.

Reference Design Partition View specifies the library/cell/view of the design partition view where modified figures are saved.

Type in or browse to specify the **Library**, **Cell**, and **View** name of the reference cellview.

Save to Design Partition View specifies the library, cell, and view of the design partition view where unmodified figures from the original design are saved.

Type in or browse to specify the **Library**, **Cell**, and **View** name of the cellview where unmodified figures are saved.

Select Net

Use the **Select Net** form to select in the *Navigator* the nets that are attached to the selected design partition.

Design Partition drop box lets you select a design partition.

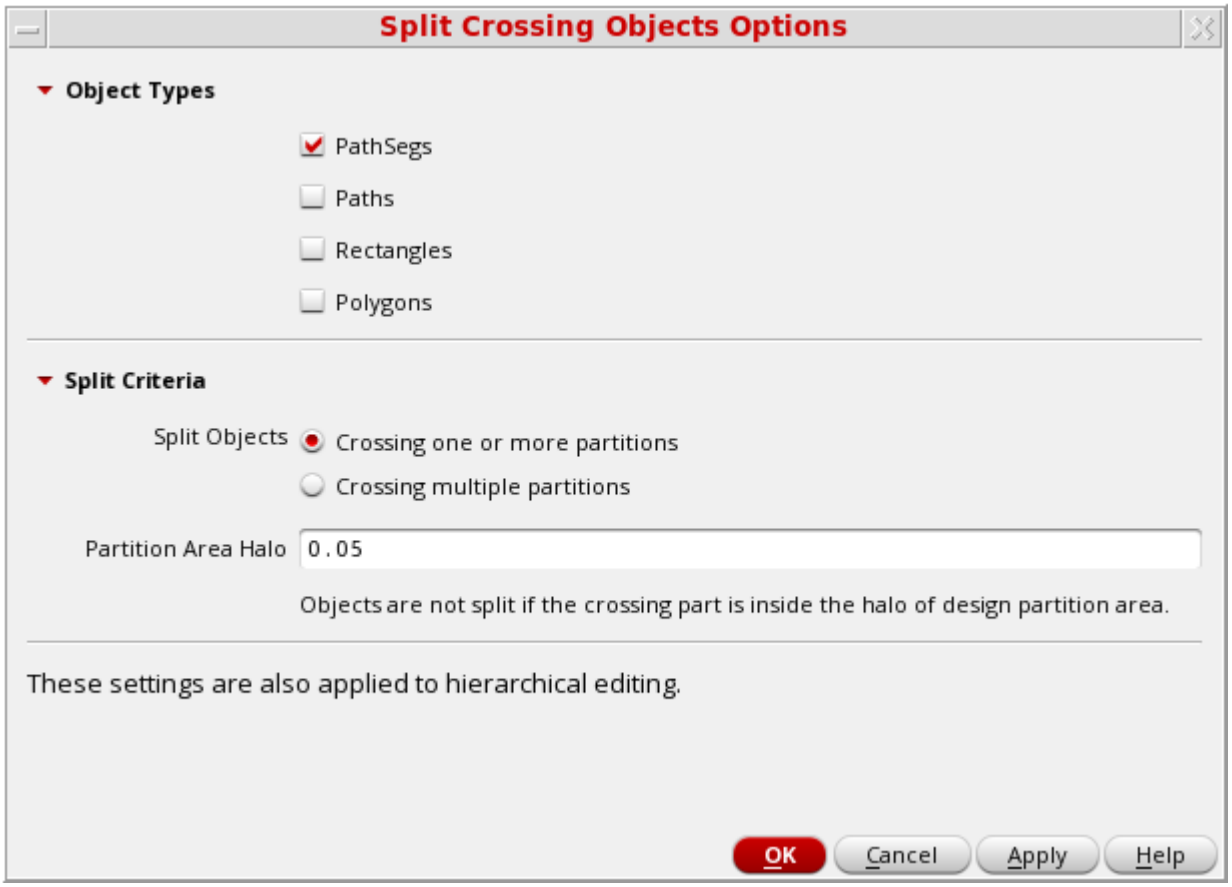
Sort section lets you sort the nets in **Ascending** or **Descending** order.

List of nets lets you select or deselect the listed nets.

Select All lets you select all nets.

Deselect All lets you deselect all nets.

Split Crossing Objects Options



Use the **Split Crossing Objects Options** form to specify how to split the objects that are part of single or multiple design partitions. All settings implemented in this form are also applied to hierarchical editing.

Object Types splits all objects crossing single or multiple partitions by object type. You can select one or more of the following objects

- PathSegs
- Paths
- Rectangle
- Polygons

Environment Variable: autoSplitObjTypes

Split Criteria sets the criteria for splitting the objects.

Split Objects specifies which objects need to be split across partitions.

Crossing one or more partitions splits the objects that are crossing one or more design partitions at the area boundary of each partition. When this option is selected, all objects that cross at least one design partition are split.

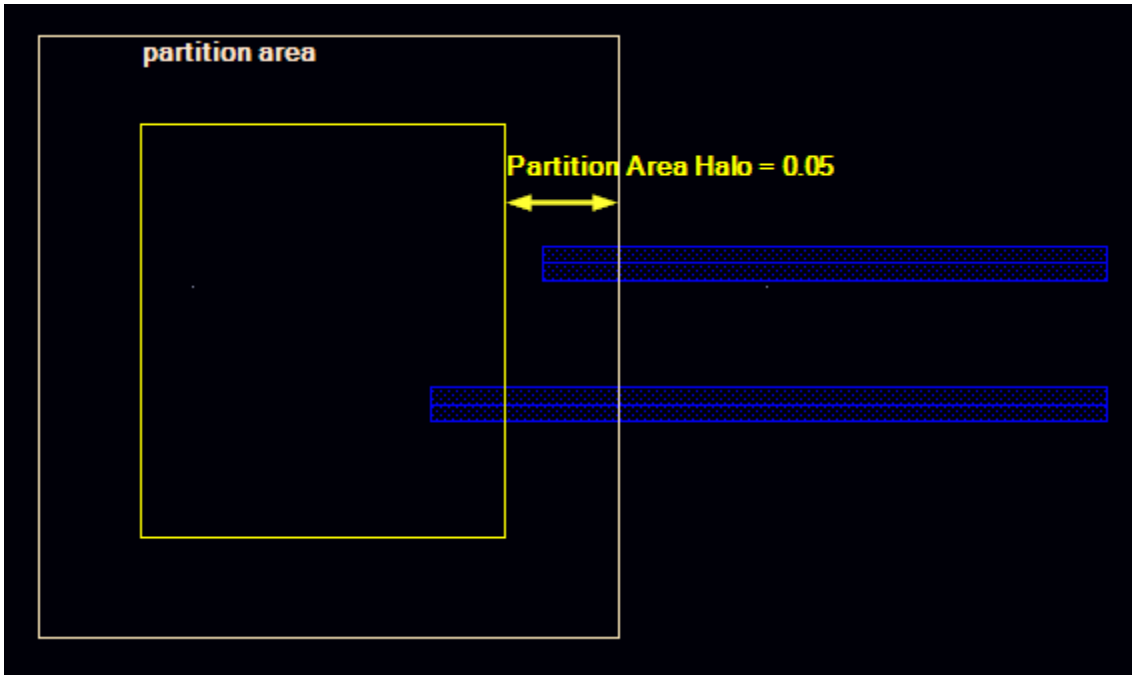
Crossing multiple partitions splits the objects that are crossing multiple design partitions at the area boundary of each partition. When this option is selected, objects crossing a single design partition are not split.

Environment Variable: autoSplitObjCrossingPartition

Partition Area Halo

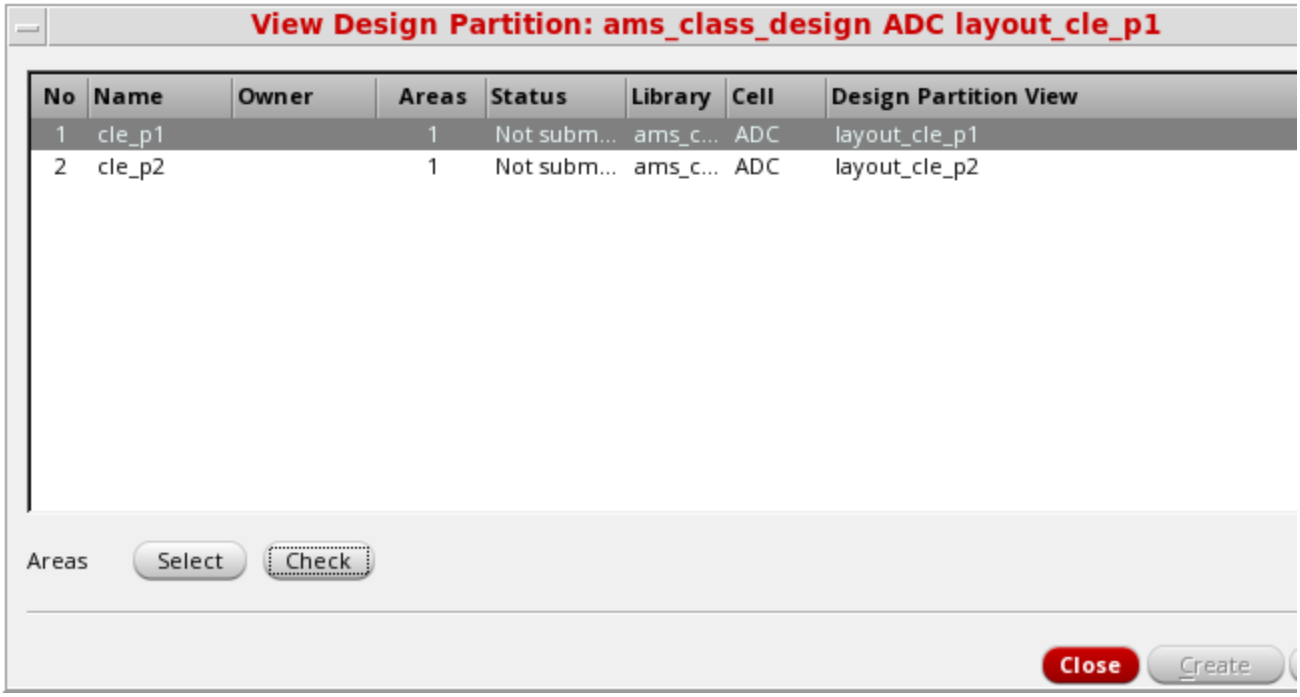
Objects are not split if the crossing part is inside the halo of design partition area.

For example, in the following screenshot, the upper path is not split because the crossing part of the path is not larger than the design partition area halo.



Note: The settings in this form are also applied during hierarchical editing.

View Design Partition



Use the **View Design Partition** form to check design partition definitions. It can help you identify attached areas, objects, and nets and to check information related to them in the Property Editor.

The following information regarding the existing design partitions is visible in the form:

Name specifies the name of the design partition.

Owner specifies the owner of the design partition. This information is not mandatory.

Areas specifies the number of areas attached to the design partition.

Objects specifies the number of objects attached to the design partition. The count also includes invisible objects.

> **Note:** This column is available only when an object-based partition exists or if cleEnableAdvPartitionType is set to `t`.

Nets specifies the number of nets attached to the design partition.

> **Note:** This column is available only when an net-based partition exists or if cleEnableAdvPartitionType is set to `t`.

Status specifies the current status of the design partition. Valid values are *Created*, *Editing*, *Submitted*, and *Merged*.

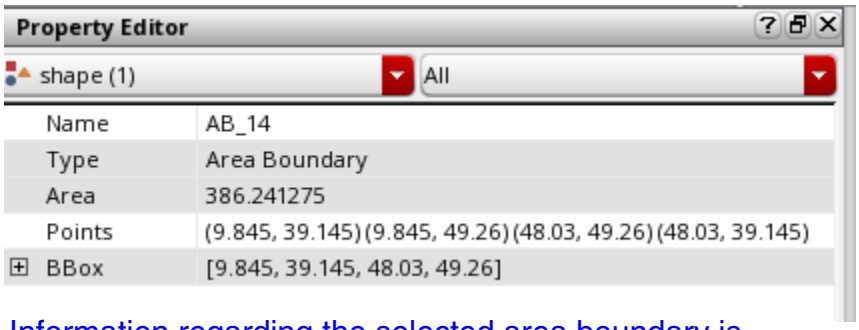
Library specifies the name of library of the design partition.

Cell specifies the cell name of the design partition.

Design Partition View specifies the design partition view name of the design partition.

Selecting a design partition will highlight the attached areas, highlight the bounding box of the attached objects, and probe the attached nets in the Navigator.

Select a design partition, and then click **Select** for **Areas**, **Objects**, or **Nets** to view the related information in the *Property Editor*.

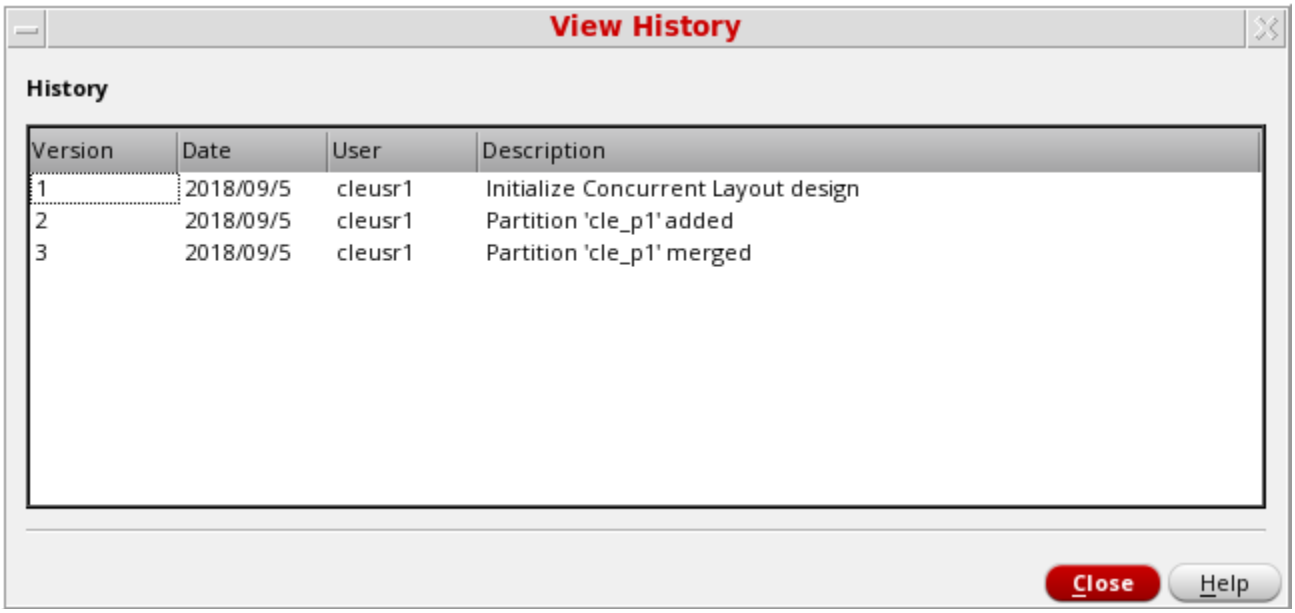


Information regarding the selected area boundary is displayed in the *Property Editor*.

When you click *Select* for *Nets*, the Select Net form is also displayed. This form lets you select the net for which you want to view the information.

Check lets you check for area overlaps in partitions and creates markers for any overlaps found.

View History

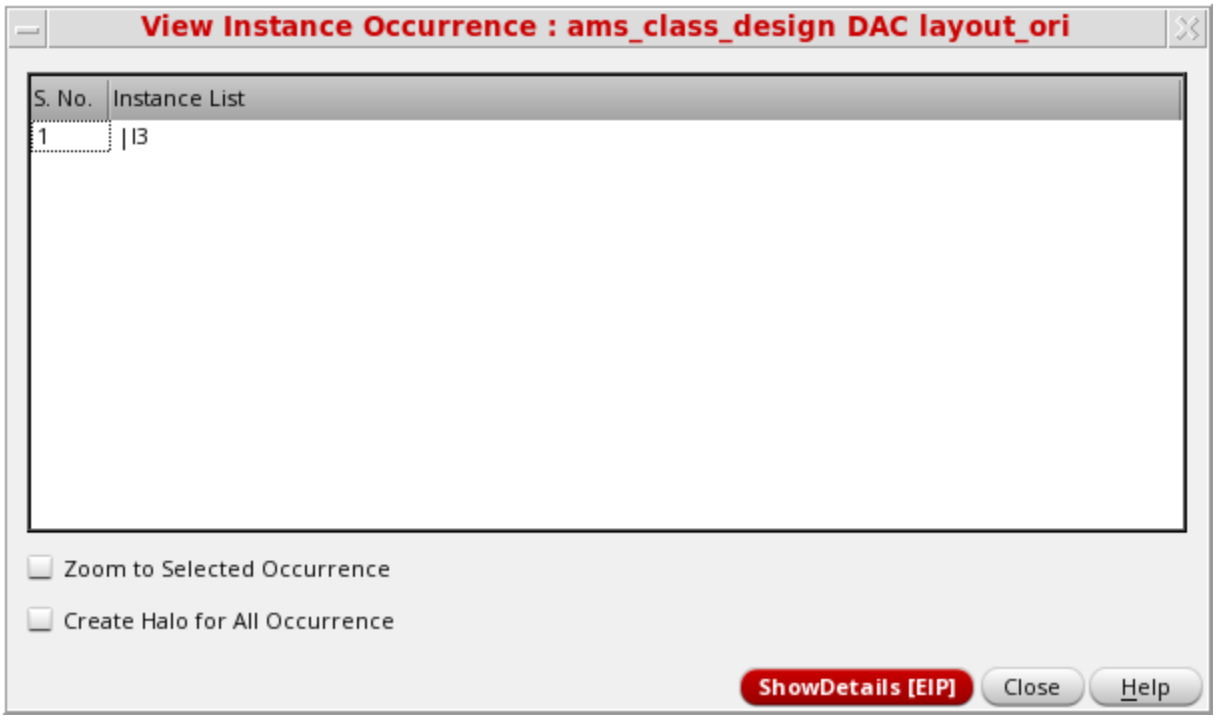


Designers can use the **View History** form to check information about important changes made to the top design. For example, nets being deleted or new partitions being added.

For more information, see Append History.

Delete Areas

View Instance Occurrence



Use the View Instance Occurrence form to view the instance occurrences up to specific display level. The minimum value is 3.

Instance List displays all instance occurrences of the selected sub block in the hierarchy.

Zoom to Selected Occurrence lets you zoom into the selected instance in the canvas.

Create Halo for All Occurrence displays halo around all instance occurrences of the selected sub block.

ShowDetails(EIP) displays the changes made to the selected instance during incremental Edit In Place.

B

Concurrent Layout Environment Variables

This appendix provides information on the names, descriptions, and graphical user interface equivalents for the Virtuoso Concurrent Layout environment variables.

All environment variables related to the Concurrent Layout are used to set default values for various Concurrent Layout options. You can set them either from CIW or load from cdsenv file through a SKILL function. For example, `envLoadFile("~/.cdsenv")`.

Note: Only the environment variables documented in this chapter are supported for public use. All other Concurrent Layout environment variables, regardless of their name or prefix, and undocumented aspects of the environment variables described below, are private and are subject to change at any time.

List of Concurrent Layout Environment Variables

- conflictRenamePin
- conflictRenameTerm
- createPartcheckAreaOverlap
- dimNotModifiedFigPreview
- displayWarningGlyph
- enableGDM
- exportFilter
- filterMarkerOutOfArea
- hideOrignalFigPreview
- highlightModifiedFigPreview
- importActionForError
- importBlockErrorID
- importFilter
- importPeerAtOpen
- importPeerViewLog
- importWarnAsError
- mergeLogFile
- mergeSizeReminder
- nameGenerator
- onlySelectOutsidePartition
- showMarkerChanges
- splitObjFilterByPalette

autoDeletePartitionView

```
layout.cle autoDeletePartitionView boolean { t | nil }
```

Description

Automatically deletes design partition views, if set to t, when the *Clear All Design Partitions* command or *Delete* command is run.

If set to `nil`, the design partition views are reset to be reused when these commands are run. The default is `nil`.

GUI Equivalent

Command	Concurrent Layout Options
Field	*Auto delete design partition view*

Examples

```
envGetVal("layout.cle" "autoDeletePartitionView")
envSetVal("layout.cle" "autoDeletePartitionView" 'boolean t)
envSetVal("layout.cle" "autoDeletePartitionView" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

autoHighlightAlerts

```
layout.cle autoHighlightAlerts boolean { t | nil }
```

Description

Highlights an alert automatically when it is added to the alert pane of the Concurrent Layout assistant. The default is `t`.

GUI Equivalent

Command	Concurrent Layout Options
Field	*Auto highlight alerts*

Examples

```
envGetVal("layout.cle" "autoHighlightAlerts")
envSetVal("layout.cle" "autoHighlightAlerts" 'boolean t)
envSetVal("layout.cle" "autoHighlightAlerts" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

autoSplitObjCrossingPartition

```
layout.cle autoSplitObjCrossingPartition cyclic { "Off" | "single" | "multiple" }
```

Description

Sets whether objects crossing single or multiple design partitions should be split at the boundary of each design partition. The default is `"single"`.

GUI Equivalent

Command	Split Crossing Objects Options
Field	*Split Criteria*

Examples

```
envGetVal("layout.cle" "autoSplitObjCrossingPartition")
envSetVal("layout.cle" "autoSplitObjCrossingPartition" 'cyclic "Off")
envSetVal("layout.cle" "autoSplitObjCrossingPartition" 'cyclic "single")
envSetVal("layout.cle" "autoSplitObjCrossingPartition" 'cyclic "multiple")
```

Related Topics

List of Concurrent Layout Environment Variables

autoSplitObjTypes

```
layout.cle autoSplitObjTypes string { "pathSeg" | "path" | "rect" | "polygon" |
     "mppPath" | "mppGuardring" }
```

Description

Specifies the object types to be split when design partitions are created or are pushed down to hierarchical sub cells. The default is `"pathSeg"`.

GUI Equivalent

Command	Split Crossing Objects Options
Field	*Object Types*

Examples

```
envGetVal("layout.cle" "autoSplitObjTypes")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "pathSeg")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "path")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "rect")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "polygon")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "mppPath")
envSetVal("layout.cle" "autoSplitObjTypes" 'string "mppGuardring")
```

You can specify multiple objects types in the following way:

```
envSetVal("layout.cle" "autoSplitObjTypes" 'string "rect polygon mppGuardring")
```

categoryName

```
layout.cle categoryName string  "category_name"
```

Description

Specifies the category name created in the Library Manager for the concurrent layout designs. When set to `""` no category is created.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "categoryName")
envSetVal("layout.cle" "categoryName" 'string "concurrent_layout")
```

Related Topics

List of Concurrent Layout Environment Variables

checkLogFile

`layout.cle checkLogFile string "check_log_file_path"`

Description

Specifies the path for the check log file. The default path is used if not specified.

The default path is `cle_check_%LIB_%CELL_%VIEW.log`.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "checkLogFile")
envSetVal("layout.cle" "checkLogFile" 'string "cle_check.log")
```

Related Topics
List of Concurrent Layout Environment Variables

cleEditMode

```
layout.cle cleEditMode cyclic { "Off" | "Only Select Inside Partition" | "Only Edit
     Inside Parition" }
```

Description

Sets the edit mode inside the current partition.

- `Off`
  Disables the edit mode settings.
- `Only Select Inside Partition`
  Lets you select only those objects that are inside the current partition.
- `Only Edit Inside Partition`
  Lets you edit only those partitions that are inside current partition.

GUI Equivalent

Command	*Concurrent Layout Options – Assistant*
Field	*Edit Scope*

Examples

```
envGetVal("layout.cle" "cleEditMode")
envSetVal("layout.cle" "cleEditMode" 'cyclic "Off")
envSetVal("layout.cle" "cleEditMode" 'cyclic "Only Select Inside Partition")
envSetVal("layout.cle" "cleEditMode" 'cyclic "Only Edit Inside Partition")
```

Related Topics
List of Concurrent Layout Environment Variables

cleEnableAdvPartitionType

```
layout.cle cleEnableAdvPartitionType boolean { t | nil }
```

Description

Enables buttons, labels, and column headers related on object-based and net-based partitions on the Define Design Partition form. Status of this environment variable is checked when the Define Design Partition form is opened.

GUI Equivalent

Command	*Define Design Partition*
Field	*Objects*, *Nets*

Examples

```
envGetVal("layout.cle" "cleEnableAdvPartitionType")
envSetVal("layout.cle" "cleEnableAdvPartitionType" 'boolean t)
envSetVal("layout.cle" "cleEnableAdvPartitionType" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

cleHierEditMode

```
layout.cle cleHierEditMode cyclic { "Regular" | "IncrByArea" }
```

Description

Specifies the action to take during hierarchal editing.

- `Regular`
  Disables the display of the Hierarchy Setup form and hierarchical editing is not done using concurrent layout.
- `IncrByArea`
  Displays the Hierarchy Setup form and lets you do hierarchical editing of area partitions using concurrent editing. GUI Equivalent.

GUI Equivalent

Command	Concurrent Layout Options – *Assistant*
Field	*Hierarchical Edit Mode*

Examples

```
envGetVal("layout.cle" "cleHierEditMode")
envSetVal("layout.cle" "cleHierEditMode" 'cyclic "Regular")
envSetVal("layout.cle" "cleHierEditMode" 'cyclic "IncrByArea")
envSetVal("layout.cle" "cleHierEditMode" 'cyclic "IncrNoArea")
```

Related Topics

List of Concurrent Layout Environment Variables

conflictMergeAction

```
layout.cle conflictMergeAction cyclic { "Skip" | "Replace" | "Rename" | "Error" }
```

Description

Specifies the action to take when conflicts are found while merging design partition views. This environment variable is used to resolve issues with objects having duplicate names.

- `Skip`
  Merges the first object and skips the next object.
- `Replace`
  The second object replaces the previous or the first object.
- `Rename`
  Renames the second object and retains both.
- `Error`
  An error is reported when duplicate entries are found.

The default is `Skip`.

GUI Equivalent

Command	*Concurrent Layout Options – Merge Design Partition View*
Field	*Conflict Action*

Examples

```
envGetVal("layout.cle" "conflictMergeAction")
envSetVal("layout.cle" "conflictMergeAction" 'cyclic "Skip")
envSetVal("layout.cle" "conflictMergeAction" 'cyclic "Rename")
envSetVal("layout.cle" "conflictMergeAction" 'cyclic "Error")
```

Related Topics

List of Concurrent Layout Environment Variables

conflictRenameNet

```
layout.cle conflictRenameNet boolean { t | nil }
```

Description

Specifies whether conflicting nets should be renamed during merge. The default is `t`, which means that conflicting nets are renamed.

GUI Equivalent

Command	*Concurrent Layout Options – Merge Design Partition View – Rename Type*
Field	Net

Examples

```
envGetVal("layout.cle" "conflictRenameNet")
envSetVal("layout.cle" "conflictRenameNet" 'boolean t)
envSetVal("layout.cle" "conflictRenameNet" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

conflictRenamePin

```
layout.cle  conflictRenamePin boolean { t | nil }
```

Description

Specifies whether conflicting pins should be renamed during merge. The default is `t`, which means that conflicting pins are renamed.

GUI Equivalent

Command	*Concurrent Layout Options – Merge Design Partition View – Rename Type*
Field	Pin

Examples

```
envGetVal("layout.cle" "conflictRenamePin")
envSetVal("layout.cle" "conflictRenamePin" 'boolean t)
envSetVal("layout.cle" "conflictRenamePin" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

conflictRenameTerm

```
layout.cle  conflictRenameTerm boolean { t | nil }
```

Description

Specifies whether conflicting terminals should be renamed during merge. The default is `t`, which means that conflicting terminals are renamed.

GUI Equivalent

Command	*Concurrent Layout Options – Merge Design Partition View – Rename Type*
Field	*Term*

Examples

```
envGetVal("layout.cle" "conflictRenameTerm")
envSetVal("layout.cle" "conflictRenameTerm" 'boolean t)
envSetVal("layout.cle" "conflictRenameTerm" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

createPartcheckAreaOverlap

```
layout.cle createPartcheckAreaOverlap boolean { t | nil }
```

Description

Checks design partitions for area overlaps and reports them in CIW. The default is `nil`.

GUI Equivalent

Command	*Concurrent Layout Options – Merge Design Partition View – Rename Type*
Field	Net

Examples

```
envGetVal("layout.cle" "createPartcheckAreaOverlap")
envSetVal("layout.cle" "createPartcheckAreaOverlap" 'boolean t)
envSetVal("layout.cle" "createPartcheckAreaOverlap" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

dimNotModifiedFigPreview

```
layout.cle dimNotModifiedFigPreview boolean { t | nil }
```

Description

Dims the display of the figures that have not been modified. The default is `nil`, which means unmodified figures are dimmed in the canvas.

GUI Equivalent

Command	*Concurrent Layout Options – Assistant*
Field	*Dim display of unmodified figures*

Examples

```
envGetVal("layout.cle" "dimNotModifiedFigPreview")
envSetVal("layout.cle" "dimNotModifiedFigPreview" 'boolean t)
envSetVal("layout.cle" "dimNotModifiedFigPreview" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

displayWarningGlyph

```
layout.cle     displayWarningGlyph boolean { t | nil }
```

Description

Shows a yellow warning glyph in the canvas whenever a change is being made outside the design partition. Clicking on the glyph will take you to the alert pane for more details. The default is `t`.

GUI Equivalent

Command	*Concurrent Layout Options – Assistant – Tracking*
Field	*Display warning glyph*

Examples

```
envGetVal("layout.cle" "displayWarningGlyph")
envSetVal("layout.cle" "displayWarningGlyph" 'boolean t)
envSetVal("layout.cle" "displayWarningGlyph" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

enableGDM

```
layout.cle enableGDM boolean { t | nil }
```

Description

Enables GDM support in Concurrent Layout.

GUI Equivalent

None.

Examples

```
envGetVal("layout.cle" "enableGDM")
envSetVal("layout.cle" "enableGDM" 'boolean t)
envSetVal("layout.cle" "enableGDM" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

exportFilter

```
layout.cle exportFilter boolean { t | nil }
```

Description

Specifies whether to filter changes for objects that the user does not own while saving a design partition view. The default is `nil`, which means that the changes made to the objects not owned by the user are not filtered and are saved in the design partition view.

GUI Equivalent

Command	*Concurrent Layout Options – Save Design Partition View*
Field	*Filter changes for objects not owned*

Examples

```
envGetVal("layout.cle" "exportFilter")
envSetVal("layout.cle" "exportFilter" 'boolean t)
envSetVal("layout.cle" "exportFilter" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

filterMarkerOutOfArea

```
layout.cle" "filterMarkerOutOfArea" boolean { t | nil }
```

Description

Selects all out-of-area markers in the Annotation Browser. You can use the *Hide Checked Markers* command in the Annotation Browser to filter the selected markers. The default is `nil`, which means that out-of-area markers are not selected.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "filterMarkerOutOfArea")
envSetVal("layout.cle" "filterMarkerOutOfArea" 'boolean t)
envSetVal("layout.cle" "filterMarkerOutOfArea" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

hideOrignalFigPreview

```
layout.cle hideOrignalFigPreview boolean { t | nil }
```

Description

Hides the figures for which changes have not been imported. The default is `t`, which means that if a shape is modified, then the original shape is removed and the modified version is displayed in the canvas. If `nil`, then only the original shapes are displayed along with the halo of the modified version..

GUI Equivalent

Command	*Concurrent Layout Options – Assistant*
Field	*Hide original figures of changes not imported*

Examples

```
envGetVal("layout.cle" "hideOrignalFigPreview")
envSetVal("layout.cle" "hideOrignalFigPreview" 'boolean t)
envSetVal("layout.cle" "hideOrignalFigPreview" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

highlightModifiedFigPreview

```
layout.cle" "highlightModifiedFigPreview" boolean { t | nil }
```

Description

Highlights all modified figures on the canvas. The default is `t`.

GUI Equivalent

Command	*Concurrent Layout Options – Assistant*
Field	*Highlight modified figures*

Examples

```
envGetVal("layout.cle" "highlightModifiedFigPreview")
envSetVal("layout.cle" "highlightModifiedFigPreview" 'boolean t)
envSetVal("layout.cle" "highlightModifiedFigPreview" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

importActionForError

```
layout.cle  importActionForError  cyclic  "Continue" nil ("Continue" "Stop"
     "StopOnID")
```

Description

Specifies the action to take when errors are found while opening a design partition view.

- `Continue`
  The design partition view continues to open even in case of error.
- `Stop`
  Stops import of design partition view in case of error.
- `StopOnID`
  Stops import of design partition view for the specified error message IDs.

The default is `Continue`.

GUI Equivalent

Command	*Concurrent Layout Options – Open Design Partition View*
Field	*Error Action*

Examples

```
envGetVal("layout.cle" "importActionForError")
envSetVal("layout.cle" "importActionForError" 'cyclic "Continue")
envSetVal("layout.cle" "importActionForError" 'cyclic "Stop")
envSetVal("layout.cle" "importActionForError" 'cyclic "StopOnID")
```

Related Topics

List of Concurrent Layout Environment Variables

importBlockErrorID

```
layout.cle  importBlockErrorID    string  ""
```

Description

Specifies the error message IDs for which the import of design partition view is stopped.

This option is available only when importActionForError is specified as `StopOnID`.

GUI Equivalent

Command	*Concurrent Layout Options – Open design partition view*
Field	*Message IDs*

Examples

```
envGetVal("layout.cle" "importBlockErrorID")
envSetVal("layout.cle" "importBlockErrorID" 'string "107009 107010")
```

Related Topics

List of Concurrent Layout Environment Variables

importFilter

```
layout.cle importFilter boolean { t | nil }
```

Description

Specifies whether to filter changes of objects that the user does not own while opening a design partition view. The default is `nil`, which means that the changes are imported.

GUI Equivalent

Command	*Concurrent Layout Options – Open Design Partition view*
Field	*Filter changes for objects not owned*

Examples

```
envGetVal("layout.cle" "importFilter")
envSetVal("layout.cle" "importFilter" 'boolean t)
envSetVal("layout.cle" "importFilter" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

importPeerAtOpen

```
layout.cle importPeerAtOpen cyclic { "Prompt" "Always" "Never" }
```

Description

Specifies whether updates made to the peer design partitions should be imported while opening design partition views.

- `Prompt`
  Prompts whether to import updates made to the peer design partitions.
- `Always`
  Automatically imports updates made to the peer design partitions.
- `Never`
  Ignores updates made to the peer design partitions.

The default is `Prompt`.

GUI Equivalent

Command	*Concurrent Layout Options – Open Design Partition View*
Field	*Import Peers*

Examples

```
envGetVal("layout.cle" "importPeerAtOpen")
envSetVal("layout.cle" "importPeerAtOpen" 'cyclic "Prompt")
envSetVal("layout.cle" "importPeerAtOpen" 'cyclic "Always")
envSetVal("layout.cle" "importPeerAtOpen" 'cyclic "Never")
```

Related Topics
List of Concurrent Layout Environment Variables

importPeerViewLog

```
layout.cle importPeerViewLog boolean { t | nil }
```

Description

Specifies whether to display the log of edit conflicts while opening design partition views. The default is `nil`, which means edit conflict log is not displayed when a design partition view opens.

GUI Equivalent

Command	*Concurrent Layout Options – Open Design Partition View*
Field	*View log of edit conflicts*

Examples

```
envGetVal("layout.cle" "importPeerViewLog")
envSetVal("layout.cle" "importPeerViewLog" 'boolean t)
envSetVal("layout.cle" "importPeerViewLog" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

importWarnAsError

```
layout.cle importWarnAsError boolean { t | nil }
```

Description

Specifies whether to convert warning messages to error messages while opening design partition views. The default is `nil`, which means that the warning messages are not converted to error messages.

GUI Equivalent

Command	*Concurrent Layout Options – Open Design Partition View*
Field	*Convert warning message IDs to errors*

Examples

```
envGetVal("layout.cle" "importWarnAsError")
envSetVal("layout.cle" "importWarnAsError" 'boolean t)
envSetVal("layout.cle" "importWarnAsError" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

includeNonMaskableLayers

```
layout.cle includeNonMaskableLayers boolean { t | nil }
```

Description

Includes the non-maskable layer column on the Partition Layers form and lets you include non-maskable layers in the layer-based design partitions. The default is `nil`, which means that the non-maskable layer column are not visible in the Partition Layers form.

GUI Equivalent

Command	*Concurrent Layout Options – Manager Only*
Field	*Include non-maskable layers*

Examples

```
envGetVal("layout.cle" "includeNonMaskableLayers")
envSetVal("layout.cle" "includeNonMaskableLayers" 'boolean t)
envSetVal("layout.cle" "includeNonMaskableLayers" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

mergeLogFile

`layout.cle mergeLogFile string "path_for_merge_log_file"`

Description

Specifies the path for the merge log file. The default path is used if not specified.

The default path is `"cle_merge_%LIB_%CELL_%VIEW.log"`.

For more information see How to Customize Log Path.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "mergeLogFile")
envSetVal("layout.cle" "mergeLogFile" 'string "")
envSetVal("layout.cle" "mergeLogFile" 'string "cle_merge.log")
```

Related Topics

List of Concurrent Layout Environment Variables

mergeSizeReminder

```
layout.cle mergeSizeReminder int { 0_to_any_positive_integer }
```

Description

Displays a warning to merge the design partition view when the number of objects being modified in the design partition view exceeds the specified value. You can disable this warning by setting the value to `0`.

GUI Equivalent

Command	*Concurrent Layout Options – Save Design Partition View*
Field	*Warn when object count exceeds*

Examples

```
envGetVal("layout.cle" "mergeSizeReminder")
envSetVal("layout.cle" "mergeSizeReminder" 'int 5000)
envSetVal("layout.cle" "mergeSizeReminder" 'int 0)
```

Related Topics

List of Concurrent Layout Environment Variables

nameGenerator

```
layout.cle  nameGenerator boolean { t | nil }
```

Description

Specifies whether to add the name of the design partition as a prefix to the name of the newly created object. This helps in preventing name conflicts among design partitions. The default is `t`, which means that the design partition name is added as a prefix to the names of new objects.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "nameGenerator")
envSetVal("layout.cle" "nameGenerator" 'boolean t)
envSetVal("layout.cle" "nameGenerator" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

onlySelectOutsidePartition

```
layout.cle onlySelectOutsidePartition boolean { t | nil }
```

Description

Specifies whether edits in manager mode should be allowed only outside design partition areas. The default is `nil`, which means that users can edit the top design from inside any design partition area. When set to `t`, users cannot edit any object inside design partition area.

GUI Equivalent

None

Examples

```
envGetVal("layout.cle" "onlySelectOutsidePartition")
envSetVal("layout.cle" "onlySelectOutsidePartition" 'boolean t)
envSetVal("layout.cle" "onlySelectOutsidePartition" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

showMarkerChanges

```
layout.cle     showMarkerChanges boolean { t | nil }
```

Description

Displays the number of markers in the *Summary* pane and the marker details in the *Details* pane of the *Concurrent Layout* assistant. The default is nil, which means that the markers are not displayed in the assistant.

Note: This option applies to the *OBJECTS* and *MODIFICATIONS* sections only. Markers in the *ALERTS* section are always displayed.

GUI Equivalent

Command	*Concurrent Layout Options – Assistant – Tracking*
Field	*Show marker changes*

Examples

```
envGetVal("layout.cle" "showMarkerChanges")
envSetVal("layout.cle" "showMarkerChanges" 'boolean t)
envSetVal("layout.cle" "showMarkerChanges" 'boolean nil)
```

Related Topics

List of Concurrent Layout Environment Variables

splitObjFilterByPalette

```
layout.cle splitObjFilterByPalette cyclic { "off" | "selectable" | "visible" }
```

Description

Filters the split objects according to their selectable and visible configurations in the palette. The default is `"off"`.

GUI Equivalent

None.

Examples

```
envGetVal("layout.cle" "splitObjFilterByPalette")
envSetVal("layout.cle" "splitObjFilterByPalette" 'cyclic "Off")
envSetVal("layout.cle" "splitObjFilterByPalette" 'cyclic "single")
envSetVal("layout.cle" "splitObjFilterByPalette" 'cyclic "multiple")
```