

# CONNECTOR FOR DESIGNSYNC SYNOPSSES CD

## OBJECTIVE

**Connector for DesignSync® Synopsys CD** provides design data management for Synopsys® Custom Designer data in Open Access format. It extends the design data management capabilities for **Software and System-on-a-Chip Designer**.

## OVERVIEW

**Connector for DesignSync Synopsys CD** integrates **Software and System-on-a-Chip Designer** with the Synopsys Customer Designer graphical integrated circuit (IC) design environment, recognizing and efficiently managing Synopsys library design data. The Synopsys Customer Designer graphical design environment is modified with the addition of **Software and System-on-a-Chip Designer** menus and commands. Designers are able to perform design data management (DDM) operations without leaving the familiar Synopsys graphical environment, and without having to manage the actual collections of files and directories on disk which represent Synopsys library objects such as schematic diagrams.

### EDA Data Awareness—Synopsys Library Recognition

Data awareness is important because data created and modified by Electronic Design Automation (EDA) tools, such as a Synopsys schematic diagram or physical layout, is typically not stored on disk as a single file. Rather, a design object, such as a schematic diagram, consists of a specific set of files. In order for a DDM system to maintain a version history of changes to the schematic diagram, this set of files must be managed as a group. The group of files is also referred to as a “co-managed” set, or “collection object.” These collection objects are stored in a larger directory structure called a “library.” A Synopsys “library” consists of “cells,” and a cell may contain multiple “views,” which are models used for different purposes, such as schematic view, a layout view, etc.

**Connector for DesignSync Synopsys CD** recognizes Synopsys Open Access libraries on disk so as not to confuse them with ordinary directories and files. Collection objects are managed transparently to the end-user. So, when a user issues a command to checkout a version of a schematic diagram, the appropriate versions of each of the member files of the collection object are checked out automatically. The member files of the collection are each individually version controlled, and a mapping is maintained between the version of the design object and the versions of the member files which constitute the version of the object. Storage of data in the DDM repository is efficient because only member files of a collection which are modified in an edit operation are stored in the new version of the design object. And because the design object is managed as a “collection,” the tool prevents direct modification to individual member files, which can result in the corruption of the object as a whole.

### The User Interface

With **Connector for DesignSync Synopsys CD**, Synopsys data recognition allows users to operate on familiar constructs such as libraries, cells, and views. **Software and System-on-a-Chip Designer** menus are included in the Synopsys graphical environment. The Synopsys AutoCheckout/AutoCheckin functionality is enabled as well.

In addition to being able to operate on libraries, cells, and views, DDM operations may also be performed on a data “Category.” For example, if a standard cell library has been categorized by types such as “FlipFlops”, all the “FlipFlops” could be checked out for edit in a single operation.

A unique capability is also provided to perform data management operations based on the “hierarchy” of the design. For example, a Synopsys library may include ALU and MULTIPLIER design blocks. If the top level ALU schematic is fetched, one might issue the “DesignSync > Hierarchy > Tag” command which would identify and tag each version of each instance of the lower level schematics.

The level of hierarchical depth can be controlled. For example, one might want to tag the hierarchy of a standard cell design, yet not descend into the transistor level representations of the standard cells themselves. Once a hierarchy is tagged, it could be fetched into a new workspace. The result would be that one or more libraries could be fetched, with valid Synopsys library structures created on disk, but the local libraries would only include the cells/views which constitute the ALU design hierarchy. This is an example of the capability to construct a workspace with a subset of the data contained in Synopsys libraries as stored in the DDM repository.

Some operations are more efficient if performed using **Software and System-on-a-Chip Designer** rather than running the commands from within the Synopsys environment. For example, when starting a new project, it is typical that multiple libraries are put under revision control. Due to the restriction within Synopsys that one must select a library before performing any operations, checking in multiple libraries requires that each be checked in separately. If a project consists of 50 libraries, for example, this is a tedious process at best. Using **Software and System-on-a-Chip Designer**, all 50 libraries can be checked in by running a single command.

## HIGHLIGHTS

Key features and capabilities include:

### Synopsys Library Recognition and Processing

Synopsys library directory structures are recognized as such. Users manipulate familiar constructs such as cells or views, while the tool automatically processes the underlying files and directories which comprise data views. Designers need not be concerned with detailed version control bookkeeping, which is handled automatically.

### Locking Model Enforced

Because Synopsys design data is binary in nature, a strict locking model is enforced. This prevents the situation in which two designers are making changes to the same version of a cell view, because once the first designer checks in the changes, there is no automated capability to merge the changes of the second designer.

### Association with a Library

When libraries are created using Custom Designer, the library is automatically associated with the **Software and System-on-a-Chip Designer** version control system so that any subsequent read/edit access is via the DesignSync® revision control repository.

## Key Benefits:

- By integrating into the Synopsys Custom Designer graphical design environment, designers work in the tools with which they are familiar.
- All vaulting operations are executed with a thorough understanding of the unique structure of a Synopsys data library.
- Manages Synopsys data, along with non-Synopsys project data, letting companies connect to and manage the entire design chain with a unified DDM system.

## Automatic Checkout and Checkin of Cell Views

Auto checkout and check-in of cell views is enabled with functions registered with the Synopsys Version Control system. Custom Designer calls the Version Control System before editing (auto checkout) and after editing (auto check-in), which communicates with **Software and System-on-a-Chip Designer**. User preferences control whether auto checkout and auto check-in occur automatically, or query the user first.

## Operating on Libraries

DDM operations may be performed on an entire Synopsys library. For example, a library may be tagged with a label which signifies a given release, or quality level. Or a library may be updated with changes checked in by other team members.

## Operating on Cells

DDM operations may also be performed at the library “cell” level. For example, all views, or a subset of the views of a cell could be checked out for edit.

## Operating on Views

DDM operations are commonly performed on individual data views in the course of daily design activity. A “DesignSync” menu in each Synopsys graphical editing tool provides convenient access to DDM commands such as check-in, tag, or version history.

## Operating on Categories

If Synopsys cell data is organized using “Categories,” DDM operations may also be performed on the categories. For example, if the cells in a standard cell library have been categorized, all the cells in a category could be checked out together.

## Operating on Design Hierarchies

A unique capability enables the processing of a design hierarchy. A hierarchy is defined as the set of instance records contained in each level of a design hierarchy. If a design hierarchy is tagged, for example, a workspace could be created which contains the set of libraries which store the design data, yet each library would contain only the cell views which comprise the hierarchy of the design. Other cell views which are stored in the server but are not part of the specific design hierarchy would not be fetched.

## Operating on Subsets of Data

It is not necessary to fetch an entire Synopsys library into a workspace in order to work on a subset of the data. Only the data of interest can be fetched. A valid Synopsys library structure is created in the workspace, but the local library contains only a subset of the data as stored in the managed library in the data repository.

## Status Reporting in the Library Manager

The Custom Designer Library Manager is modified to include revision control information for cell views including versions, tags, and locking status.

## Distributing a Library Across Multiple Data Repositories

A single library can be distributed across multiple data repositories by using **Software and System-on-a-Chip Designer** module-based data storage. Local efficiencies are maximized at each design center because the majority of data transfer activity (check-in/checkout) occurs locally.

## GUI and Command Line Support

Although most day-to-day data editing operations are performed from within the Synopsys Custom Designer graphical design environment, DDM operations on Synopsys library data can be performed using either the **Software and System-on-a-Chip Designer** GUI or command line. Multiple libraries can be processed using one command, which is not possible from within the Synopsys environment.

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