Milkyway™ Database Application Note

Version 5.1, December 2010

SYNOPSYS®

Contents

Preface

This preface includes the following sections:

What's New in This Release

Information about new features, enhancements, and changes, along with known problems and limitations and resolved Synopsys Technical Action Requests (STARs), is available in the product release notes in SolvNet.

To see the product release notes,

1. Go to the Download Center on SolvNet located at the following address:

   https://solvnet.synopsys.com/DownloadCenter

   If prompted, enter your user name and password. If you do not have a Synopsys user name and password, follow the instructions to register with SolvNet.
2. Select Milkyway, and then select a release in the list that appears.

About This Application Note

This application note describes the Milkyway database, the unifying design storage format for tools in the Synopsys Galaxy™ Design Platform, including Design Compiler, IC Compiler, StarRC™, IC Validator, PrimeRail, and the Milkyway Environment.

Audience

This application note is for engineers who use one or more Synopsys tools to store or access physical design data in the Milkyway format.

Related Publications

For additional information about the Milkyway database and tools that work with the database, see the documentation on SolvNet at the following address:

https://solvnet.synopsys.com/DocsOnWeb

Conventions

The following conventions are used in Synopsys documentation.

Convention	Description
`Courier`	Indicates syntax, such as `write_file`.
`Courier italic`	Indicates a user-defined value in syntax, such as `write_file` *`design_list`*.
`Courier bold`	Indicates user input—text you type verbatim—in examples, such as `prompt>` **`write_file top`**
[ ]	Denotes optional arguments in syntax, such as `write_file [-format` *`fmt`*`]`
...	Indicates that arguments can be repeated as many times as needed, such as *`pin1 pin2 ... pinN`*
|	Indicates a choice among alternatives, such as `low | medium | high`
Control-c	Indicates a keyboard combination, such as holding down the Control key and pressing c.
\	Indicates a continuation of a command line.
/	Indicates levels of directory structure.
Edit > Copy	Indicates a path to a menu command, such as opening the Edit menu and choosing Copy.

Customer Support

Customer support is available through SolvNet online customer support and through contacting the Synopsys Technical Support Center.

Accessing SolvNet

SolvNet includes a knowledge base of technical articles and answers to frequently asked questions about Synopsys tools. SolvNet also gives you access to a wide range of Synopsys online services including software downloads, documentation, and technical support.

To access SolvNet, go to the following address:

https://solvnet.synopsys.com

If prompted, enter your user name and password. If you do not have a Synopsys user name and password, follow the instructions to register with SolvNet.

If you need help using SolvNet, click HELP in the top-right menu bar.

Contacting the Synopsys Technical Support Center

If you have problems, questions, or suggestions, you can contact the Synopsys Technical Support Center in the following ways:

- Open a support case to your local support center online by signing in to SolvNet at https://solvnet.synopsys.com, clicking Support, and then clicking "Open A Support Case."
- Send an e-mail message to your local support center.
  - E-mail support_center@synopsys.com from within North America.
  - Find other local support center e-mail addresses at http://www.synopsys.com/Support/GlobalSupportCenters/Pages
- Telephone your local support center.
  - Call (800) 245-8005 from within North America.
  - Find other local support center telephone numbers at http://www.synopsys.com/Support/GlobalSupportCenters/Pages

1 The Milkyway Database

The Milkyway database is the unifying design storage format for the Synopsys Galaxy™ Design Platform. The database provides persistent storage of physical design data that links Galaxy platform tools together. The database is periodically updated with new features to support advances in EDA technology.

The basic features of the Milkyway database are described in the following sections:

- Milkyway Database Overview
- Milkyway Database Model Versions
- Milkyway Libraries and Cells
- Milkyway-Related Commands
- Physical Library Data Preparation

Detailed usage information is provided in the documentation for the respective tools that access the Milkyway database, including Design Compiler, IC Compiler, IC Validator, PrimeRail, StarRC, and the Milkyway Environment tool.

Milkyway Database Overview

The Milkyway database is the unifying design storage format for the Synopsys Galaxy Design Platform. The database provides persistent data storage that links Galaxy platform tools together, which eliminates the need for large, intermediate exchange files and prevents loss of design intent that could occur using other data exchange formats. The Milkyway database format is regularly augmented with new capabilities to support tool features such as signal integrity analysis, power reduction, and yield enhancement.

The Milkyway database offers the following features and benefits:

- Production-proven database for all Galaxy Design Platform tools
- Capacity to support the largest designs
- Support for the latest technologies, including 65, 45, and 32 nm
- Third-party data input to the Galaxy Platform via LEF and DEF

For today's large designs, tremendous volumes of data are generated as designs move through the implementation phase. Without a common database, tools must communicate through ASCII design interchange files that present a range of problems, including excessive files sizes and transfer times, errors due to semantic mismatches, and inconsistent revision of data formats between different tools.

The Milkyway database solves these issues for the Galaxy Platform because all implementation tools have direct, binary interfaces to the database. Direct database access eliminates the need for large, slow ASCII interchange files and semantic gaps between different tool functions. Each tool is able to see the data in the same way, preventing costly errors and reducing design iterations.

The following Synopsys tools use the Milkyway database:

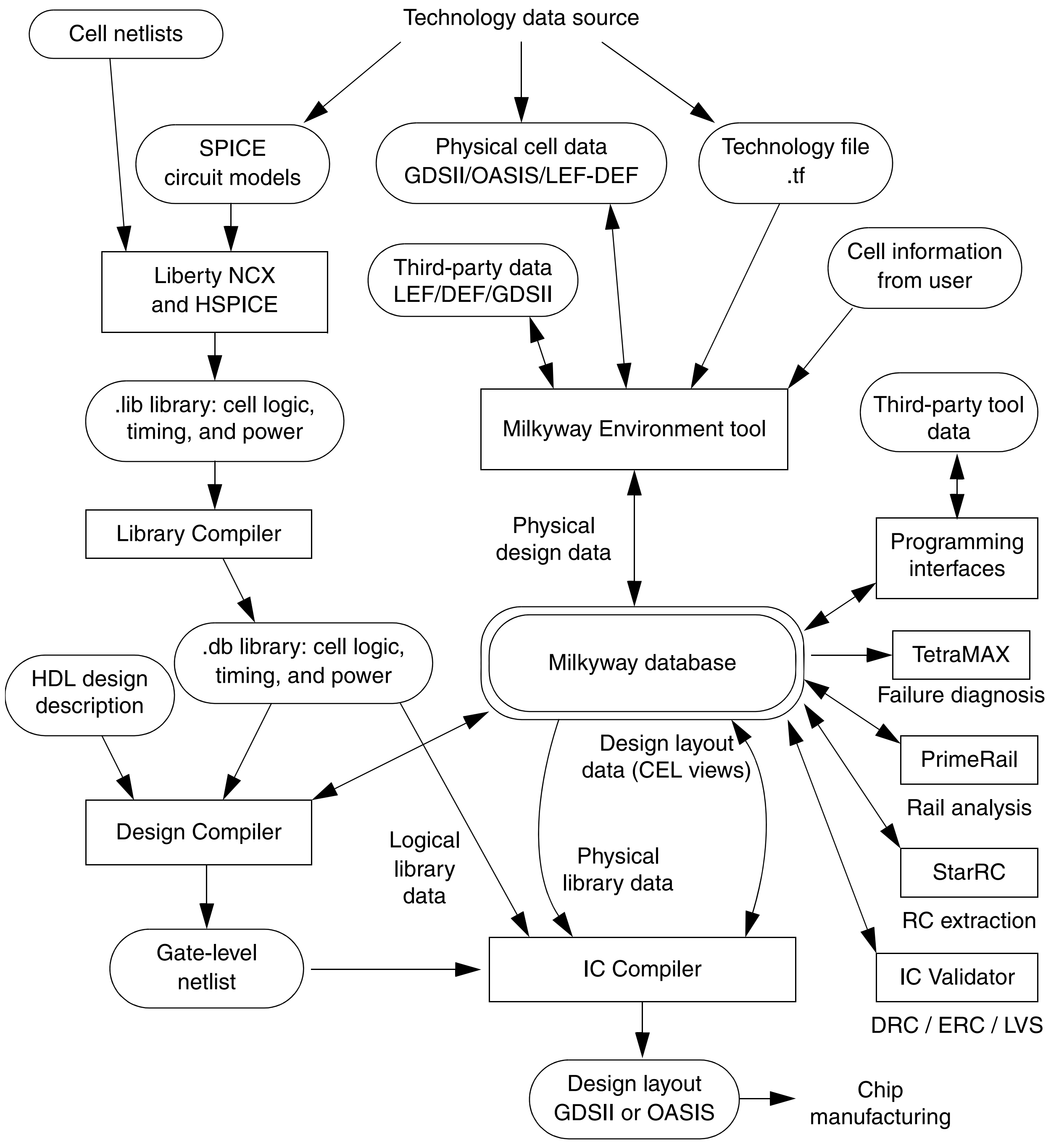
- Design Compiler writes a mapped, uniquified design into the Milkyway database with the `write_milkyway` command, including the netlist and synthesis constraints. It also writes the Synopsys Physical Guidance (SPG) information, if any. It can also write out the design in other formats such as .ddc and Verilog.
- IC Compiler reads physical design information and library cell information from the Milkyway database to perform placement, clock tree synthesis, and routing. It writes the resulting chip design information back into the Milkyway database.
- The Milkyway Environment prepares new library cells from physical data in other formats such as GDSII, OASIS, and LEF/DEF, and writes the new library cells to the Milkyway database. The Milkyway Environment can also be used to copy, edit, and delete cells; and to perform blockage, pin, and via (BPV) extraction to make FRAM views.

- IC Validator reads physical design information from the Milkyway database to perform design rule checking (DRC), electrical rule checking (ERC), layout versus schematic (LVS) checking, and fill-pattern generation. It writes the results back into the database for IC Compiler to read and use for error reporting.
- PrimeRail reads physical design data from the CEL and FRAM views in the Milkyway database to perform IR drop and electromigration analysis. In some cases, it reads connectivity information from the CONN or XTR views and parasitic RC data from the PARA view. It stores the rail analysis results in the RAIL view.
- StarRC reads physical design information from the Milkyway database to perform parasitic RC extraction. It writes the results back into the database for IC Compiler to read and use for timing and crosstalk analysis.
- Older tools such as JupiterXT™, Astro®, and Hercules™ use the Milkyway database in a manner similar to the corresponding current tools.

For detailed information about using Synopsys tools with the Milkyway database, see the documentation for the respective tools, available on SolvNet. The Milkyway Environment tool can be used for Milkyway library maintenance and library cell preparation as described in the *Library Data Preparation for IC Compiler User Guide*, available on SolvNet in the IC Compiler documentation collection.

Figure 1-1 shows some of the chip design and analysis data flows using the Milkyway database.

Figure 1-1 Milkyway Database Usage in the Galaxy Design Platform



Milkyway Database Model Versions

The Milkyway database infrastructure is periodically updated to support new database features. When a major new version is released, existing Milkyway design libraries must be updated to the new database model version in order to work with the Synopsys tools released at the same time or after the Milkyway version release.

Table 1-1 shows the earliest IC Compiler and Milkyway Environment product version number corresponding to each new Milkyway database model version.

Table 1-1 IC Compiler and Milkyway Environment Versions and Milkyway Versions

IC Compiler and Milkyway Environment version	Milkyway version
D-2010.03-SP1	5.1 (compatible with version 5.0)
D-2010.03	5.0
C-2009.06	4.0
B-2008.09	3.2
A-2007.12	2.0

A major database model version update, such as from 4.0 to 5.0, requires an update of Milkyway design libraries to work with current tools. Reference libraries do not need to be updated. A minor version update involving a number change after the decimal point, such as from 5.0 to 5.1, does not require an update of existing libraries. Design libraries saved under Milkyway versions 5.0 and 5.1 can be used freely with any tools that support versions 5.0 and 5.1.

Note:
IC Compiler and Milkyway Environment versions D-2010.03 through E-2010.12 are compatible with Milkyway versions 5.0 and 5.1, so no database update is needed when reading designs saved under these versions into IC Compiler or Milkyway Environment version E-2010.12.

Table 1-2 is a list of Synopsys tools and the earliest release numbers of those tools that are compatible with Milkyway versions 5.0 and 5.1.

Table 1-2 Earliest Versions of Synopsys Tools That Support Milkyway Version 5.0/5.1

Synopsys tool name	**Earliest tool release that supports Milkyway version 5.0/5.1**
Design Compiler	D-2010.03
Formality	D-2010.03
IC Compiler	D-2010.03
IC Validator	D-2009.12-SP1
Library Compiler	D-2010.03
MVRC (MVtools)	Tools do not read Milkyway database
PrimeRail	D-2009.12-SP1 and D-2010.06
PrimeTime/PrimeTime-SI	D-2010.06
PrimeYield LCC	B-2008.09-SP2
StarRC	D-2010.06
TetraMAX ATPG	E-2010.12

Note:
There are no plans to update Milkyway database support for Astro and JupiterXT. Hercules version B-2008.09-SP3 uses Milkyway 5.0.

You can explicitly convert Milkyway cells and libraries from the previous Milkyway database model version to the current version by using the `convert_mw_lib` command in IC Compiler or the Milkyway Environment. If you do not convert your data explicitly, when you open a Milkyway cell with the latest version of the tool, the tool performs an implicit conversion of the cell and issues a message about the conversion. You should save the converted cell before you close the library. Otherwise, the conversion will need to be performed again when you reopen the cell.

Using the `convert_mw_lib` command to convert all your data is recommended. This ensures complete conversion of your data and is more efficient than converting cells one at a time. In IC Compiler, you can use the `-previous` option of the `convert_mw_lib` command to convert a library from the current Milkyway database model version to the previous version. For more information, see the man page for the `convert_mw_lib` command, the *IC Compiler Implementation User Guide*, or the *Library Data Preparation for IC Compiler User Guide*.

Milkyway Libraries and Cells

A physical library contains information about the geometry of the cells that are placed in the design and connected with power, ground, clock, and signal routes. This library information includes the cell dimensions, border, pin locations, and mask layers, as well as technology information such as wire tracks, antenna rules, and electromigration data.

The physical library information is maintained in the Milkyway database. Synopsys tools can access the design and library information in the database. The database contains not only leaf-level physical cell information and technology information, but also design-specific physical information such as the placement and routing of the design.

The Milkyway database is organized as a hierarchy of data files. However, you must not create, delete, copy, or edit these files directly using operating system commands such as `cp` and `rm`. Instead, you should access the database by using a compatible tool such as IC Compiler or the Milkyway Environment and use the tool commands to read, write, or change the database contents. This will ensure the consistency and integrity of the database.

In Design Compiler, IC Compiler, or the Milkyway Environment, you open a Milkyway database for viewing or editing with the `open_mw_lib` command. By default, opening a Milkyway library makes that library accessible to the tool for both reading and writing physical design information. You can open no more than one Milkyway design library at a time. However, the design can contain references to cells contained in other Milkyway libraries, called reference libraries. Multiple users can open same design library in different sessions. However, only one user at a time can have permission to write into a Milkyway design library.

The basic unit of information in a Milkyway library is the cell. A cell is a representation of a physical structure in the chip layout, which can be something as simple as a single via or as large and complex as an entire chip. In IC Compiler or the Milkyway Environment, you open a cell for editing by using the `open_mw_cel` command. The cell must be contained in the Milkyway library that is currently open.

A chip design is typically built as a hierarchy of cells. The entire chip is a single cell built out of lower-level blocks, which are also cells. These blocks are built out of smaller blocks, and so on, down to the level of leaf-level cells, which are gate-level standard cells.

Cell Views

The Milkyway database can contain different representations of the same cell, called “views” of that cell. These are the main types of views used in physical implementation tools:

- CEL view: The full layout view of a physical structure such as a via, standard cell, macro, or whole chip; contains placement, routing, pin, and netlist information for the cell
- FRAM view: An abstract representation of a cell used for placement and routing; contains only the metal blockages, allowed via areas, and pins of the cell
- ILM view: An interface logic model representation of a cell, which is created from a CEL view by the `create_ilm` command in IC Compiler
- FILL view: A view of metal fill, which is used for chip finishing and has no logical function, created by the `insert_metal_filler` command in IC Compiler.
- ERR view: A graphical view of physical design rule violations found by verification commands in the physical implementation tool

A physical design stored in a Milkyway library must have at least a CEL view, which contains all of the cell information needed for placement, routing, and mask generation. This includes placement information such as tracks, site rows, and placement blockages; routing information such as netlist, pin, route guide, and interconnect modeling information, and all mask layer geometries, which are used for final mask generation.

Each macro cell typically has both a CEL view and a FRAM view. The FRAM view is an abstraction of the cell containing only the information needed for placement and routing: the metal blockage areas where routes are not allowed, the allowed via areas, and the pin locations. The process of creating a FRAM view from a CEL view is often called blockage, pin, and via (BPV) extraction.

Each gate-level standard cell can also have both a CEL view and a FRAM view. The FRAM view is used for placement and routing, whereas the CEL view is used only for generating the final stream of mask data for chip manufacturing.

Additional types of views are created and used by various special-purpose tools. For example, PrimeRail stores its rail analysis results in a RAIL view in the Milkyway database.

Do not attempt to copy, edit, or delete cell view files directly in the Milkyway database using operating system commands such as `cp` or `rm`. Instead, use a compatible tool such as IC Compiler or the Milkyway Environment to make any changes to cell views.

In the past, the Milkyway database was used to store logic, timing, and power data files in LM, TIM, and PWR views. However, these types of information are now usually stored in files maintained outside the Milkyway database, such as .db files.

Design and Reference Libraries

The Milkyway database contains the physical library information needed by implementation and analysis tools. The database contains not only leaf-level physical cell information and technology information, but also design-specific physical information such as the placement and routing results. A chip design typically uses multiple libraries, organized as a hierarchy of design libraries and reference libraries.

A Milkyway library that you open for editing is called a design library. You can open no more than one design library at a time. A library can contain any number of cells. You can open and display multiple cells at the same time from one library. A cell can be built using instances of cells from other libraries that are not currently open. These other libraries are called reference libraries.

In Design Compiler, IC Compiler, or the Milkyway Environment, you can open a Milkyway design library by using the `open_mw_lib` command. In IC Compiler and the Milkyway Environment, you can open a cell in that library for editing by using the `open_mw_cel` command.

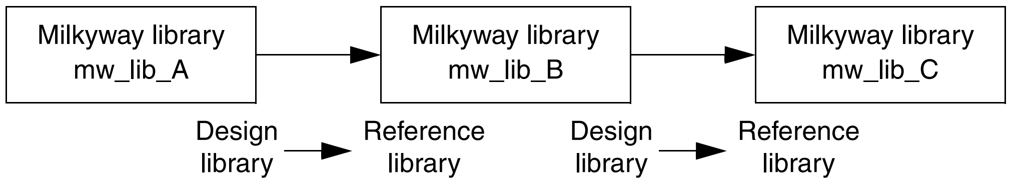
A design is typically built as a hierarchy of cells. The entire chip is a single cell built out of lower-level blocks, which are also cells. These blocks are built out of smaller blocks, and so on, down to the level of leaf-level cells. The physical representations of these cells are stored in Milkyway libraries.

When you open a Milkyway library, you can have both read and write access to the cells in that library. The open library containing the design you are working on is called the design library. The lower-level cells in the design can be found in either the design library that is currently open or in Milkyway libraries that are not open. The other Milkyway libraries containing lower-level cells are called reference libraries. The design you are working on contains hierarchical references to cells contained in those libraries.

The terms “design library” and “reference library” describe a one-way relationship between two Milkyway libraries. If you define mw_lib_B to be a reference library of design library mw_lib_A, then cells contained in mw_lib_B can used to build cells contained in mw_lib_A. However, this does not imply that cells contained in mw_lib_A can be used to build cells in mw_lib_B.

A given Milkyway library can serve as both a design library and a reference library. For example, you can define mw_lib_B to be a reference library of mw_lib_A and define mw_lib_C to be a reference library of mw_lib_B. Then cells in mw_lib_C can be used to build designs in mw_lib_B, and cells in mw_lib_B can be used to build cells in mw_lib_A. Thus, mw_lib_B is a reference library of mw_lib_A and also a design library to mw_lib_C, as shown in Figure 1-2.

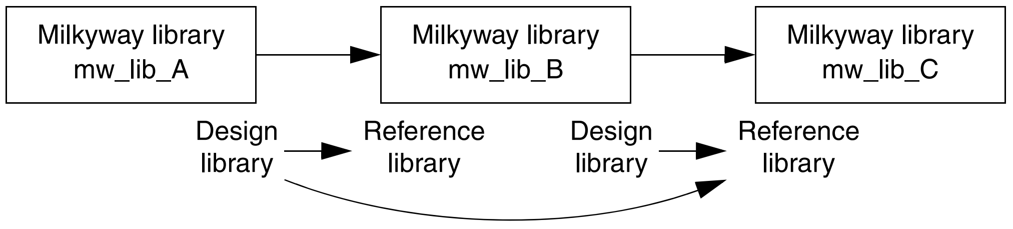
Figure 1-2 Design and Reference Library Relationships Example 1


Milkyway library mw_lib_A
Milkyway library mw_lib_B
Milkyway library mw_lib_C
Design library
Reference library
Design library
Reference library

```
LIBRARY /mw/LIBS/mw_lib_A        LIBRARY /mw/LIBS/mw_lib_B
 REFERENCE /mw/LIBS/mw_lib_B      REFERENCE /mw/LIBS/mw_lib_C
```

Each reference library definition is one level deep. In Figure 1-2, cells in mw_lib_C cannot be used *directly* in mw_lib_A because the relationship is two levels deep. However, library mw_lib_C can also be explicitly defined as a reference library of mw_lib_A, which would allow its cells to be used directly in mw_lib_A. See Figure 1-3.

Figure 1-3 Design and Reference Library Relationships Example 2


Milkyway library mw_lib_A
Milkyway library mw_lib_B
Milkyway library mw_lib_C
Design library
Reference library
Design library
Reference library

```
LIBRARY /mw/LIBS/mw_lib_A        LIBRARY /mw/LIBS/mw_lib_B
 REFERENCE /mw/LIBS/mw_lib_B      REFERENCE /mw/LIBS/mw_lib_C
 REFERENCE /mw/LIBS/mw_lib_C
```

The Milkyway library that is currently open is the design library. The associated Milkyway libraries containing read-accessible cells are the reference libraries. You define the association between design and reference libraries with the `set_mw_lib_reference` command.

Setting Milkyway Reference Libraries

In Design Compiler, IC Compiler, or the Milkyway Environment, the `set_mw_lib_reference` command defines the Milkyway reference libraries associated with a specified Milkyway design library. To use this command, the Milkyway design library must be *closed*. If the design library is currently open, close it first with the `close_mw_lib` command.

You can specify the list of reference libraries explicitly in the command itself or in a separate text file called the reference control file. You must specify relative or absolute paths to the top-level Milkyway directory names.

For example, to define the Milkyway libraries mw_lib_B and mw_lib_C to be reference libraries of design library mw_lib_A, first close mw_lib_A if it is open. Then use the following command:

```
prompt> set_mw_lib_reference \
         -mw_reference_library {/mw/LIBS/mw_lib_B /mw/LIBS/mw_lib_B} \
         /mw/LIBS/mw_lib_A
```

To define the reference libraries using an external file instead of an explicit list in the command, use the following command:

```
prompt> set_mw_lib_reference \
         -reference_control_file my_refs_A /mw/LIBS/mw_lib_A
```

You specify an absolute or relative path to the reference control file as well as to the Milkyway design library. The file format is described in the next section.

To generate a report showing a list of the reference libraries defined for a particular design library, use the `report_mw_lib` with the `-mw_reference_library` option. For example,

```
prompt> report_mw_lib -mw_reference_library mw_lib_A
/mw/LIBS/mw_lib_B
/mw/LIBS/mw_lib_C
```

If you do not specify which Milkyway design library to report, the currently open Milkyway library is reported.

Milkyway Reference Control File

You can specify the Milkyway reference libraries associated with a Milkyway design library by using an ASCII text file called a reference control file. The `set_mw_lib_reference` command invokes this file when you use the `-reference_control_file` option.

This is the syntax of the reference control file:

```
LIBRARY path_to_mw_design_library_directory
 REFERENCE path_to_mw_reference_library_directory
 REFERENCE path_to_mw_reference_library_directory
 REFERENCE path_to_mw_reference_library_directory
 ...
```

For example,

```
LIBRARY /mw/LIBS/mw_lib_A
 REFERENCE /mw/LIBS/mw_lib_B
 REFERENCE /mw/LIBS/mw_lib_C
```

In this example, mw_lib_B and mw_lib_C are reference libraries of design library mw_lib_A. Cells contained in the reference libraries can be used as instances to build cells contained in the design library.

Specify absolute, not relative, paths to the Milkyway design and reference libraries.

To have the tool generate a reference control file automatically from an existing Milkyway design library that already has reference libraries defined, use the `write_mw_lib_files` command with the `-reference_control_file` option. For example, to generate a reference control file called my_refs_A for the library mw_lib_A, use the following command:

```
prompt> write_mw_lib_files -reference_control_file \
         -output my_refs_A /mw/LIBS/mw_lib_A
```

This can be done with the mw_lib_A library either open or closed. However, you must specify the absolute or relative path to the design library.

Logic Libraries

The cell logic, timing, and power information is typically contained in a set of Synopsys database (.db) files, which are maintained separately from the Milkyway database. The .db files are produced by Library Compiler from a set of technology characterization files in Liberty (.lib) format.

The Liberty (.lib) files are ASCII-format files that fully describe the cell logic, timing, and power characteristics of the leaf-level logic cells. Library Compiler compiles the .lib files to produce .db files, which contain the same information as the .lib files, but in a compiled binary format that is more efficient for Galaxy tools to use. In Design Compiler or IC Compiler, you specify the .db files to use by setting the `search_path`, `target_library`, and `link_library` variables.

The names of the cells in the logical libraries must match the names of the corresponding cells in the physical libraries in the Milkyway database. You can verify that the logical and physical libraries properly match by using the `check_library` command in Design Compiler, IC Compiler, or the Milkyway Environment.

Milkyway-Related Commands

Table 1-3 lists and briefly describes Milkyway-related commands used in IC Compiler and the Milkyway Environment. These commands let you open, edit, and close Milkyway libraries and cells.

Note:
You must not create, copy, edit, or delete Milkyway database files directly using operating system commands such as `cp` or `rm`. Instead, access the database by using a compatible tool such as IC Compiler or the Milkyway Environment and use the tool commands to edit the database contents. This will ensure the consistency and integrity of the database.

Table 1-3 Milkyway-Related Commands in IC Compiler and Milkyway Environment

Command	Action Performed
`check_library`	Checks logical and physical libraries for quality and consistency
`close_mw_cel`	Closes one or more open cells in the open Milkyway library
`close_mw_lib`	Closes the current Milkyway library
`convert_mw_lib`	Converts the design data in a Milkyway library to the current version
`copy_mw_cel`	Copies a cell to create a new cell in the current Milkyway library
`copy_mw_lib`	Copies a Milkyway library
`create_mw_cel`	Creates a new cell in the current Milkyway library
`create_mw_lib`	Creates a new Milkyway library
`current_mw_cel`	Specifies or reports the current cell on which commands operate
`current_mw_lib`	Reports the current Milkyway library; creates a collection containing that library
`get_mw_cels`	Creates a collection of cells in the current Milkyway library that meet specified criteria
`list_mw_cels`	Lists the cells contained in the current Milkyway library
`open_mw_cel`	Opens a cell in the current Milkyway library for viewing or editing
`open_mw_lib`	Opens a Milkyway library for editing, making it the current Milkyway library
`rebuild_mw_lib`	Rebuilds a Milkyway library by scanning all cells in the library directory
`remove_mw_cel`	Removes cells from the current Milkyway library

Table 1-3 Milkyway-Related Commands in IC Compiler and Milkyway Environment (Continued)

Command	Action Performed
`report_milkyway_verson`	Reports the data file version number, Milkyway database model version, and creation information for a cell
`rename_mw_cel`	Renames a cell in the current Milkyway library
`rename_mw_lib`	Renames a Milkyway library
`report_mw_lib`	Reports the unit range or reference libraries of a Milkyway library
`save_mw_cel`	Saves an edited cell into the current Milkyway library
`set_mw_lib_reference`	Sets the lower-level reference Milkyway libraries associated with a given Milkyway library
`set_mw_technology_file`	Sets a technology file (.tf, .plib, or .alf) associated with the current Milkyway library
`write_mw_lib_files`	Writes the library technology information or library reference information to a file

Table 1-4 lists and briefly describes Milkyway-related commands used in Design Compiler. These commands let you open, edit, and close Milkyway libraries, but not individual cells. Design Compiler lets you open a Milkyway library with the `open_mw_lib` command, write the current design into a Milkyway cell with the `write_milkyway` command, and close the library with the `close_mw_lib` command.

Table 1-4 Milkyway-Related Commands in Design Compiler

IC Compiler Command	Action Performed
`check_library`	Checks logical and physical libraries for quality and consistency
`close_mw_lib`	Closes the current Milkyway library
`copy_mw_lib`	Copies a Milkyway library
`create_mw_lib`	Creates a new Milkyway library
`current_mw_lib`	Reports the current Milkyway library; creates a collection containing that library
`open_mw_lib`	Opens a Milkyway library for editing, making it the current Milkyway library

Table 1-4 Milkyway-Related Commands in Design Compiler (Continued)

IC Compiler Command	Action Performed
`rebuild_mw_lib`	Rebuilds a Milkyway library by scanning all cells in the library directory
`rename_mw_lib`	Renames a Milkyway library
`report_mw_lib`	Reports the unit range or reference libraries of a Milkyway library
`set_mw_lib_reference`	Sets the lower-level reference Milkyway libraries associated with a given Milkyway library
`set_mw_technology_file`	Sets a technology file (.tf, .plib, or .alf) associated with the current Milkyway library
`write_milkyway`	Writes the design information into a cell in the Milkyway database, including the floorplan, placement, and routing data, if any; the `mw_design_library` variable must be set first
`write_mw_lib_files`	Writes the library technology information or library reference information to a file

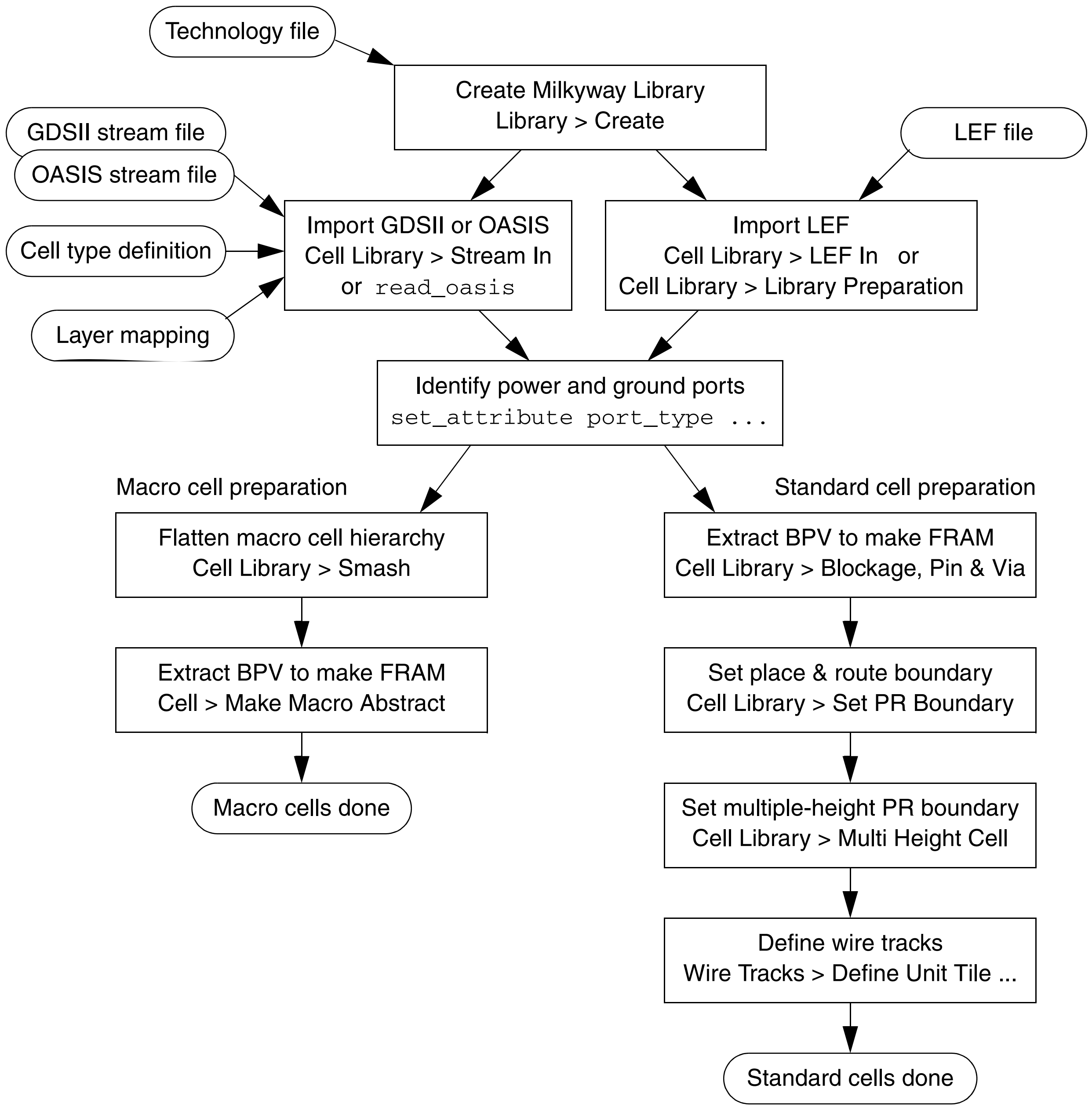
Physical Library Data Preparation

An important task in the IC design flow is the preparation of standard cells and macro cells from physical data obtained from an external source. This information is usually provided in one of the following standard data interchange formats:

- GDSII stream format, a well-established industry-standard data exchange format for integrated circuit layout information
- OASIS, a newer data stream format designed as an improved replacement for GDSII
- LEF/DEF, a set of standard data exchange formats for physical libraries (Library Exchange Format) and design data (Design Exchange Format)

Figure 1-4 summarizes the library cell preparation steps using the Milkyway Environment tool. You start by creating a new Milkyway library. Then you import the physical data in GDSII, OASIS, or LEF/DEF format and provide any additional information needed to create Milkyway CEL models for the cells in the library. You then specify the power and ground ports, create the FRAM views of the cells, and specify other physical properties required in the FRAM model. The specific steps you need to perform depend on whether you are preparing macro cells or standard cells.

Figure 1-4 Library Preparation Flow in the Milkyway Environment



For detailed information about the library data preparation flow in the Milkyway Environment, see the *Library Data Preparation for IC Compiler User Guide*, available on SolvNet in the IC Compiler documentation set.