

IC Compiler 2010.03 Incremental Training

**Milkyway
Enhancements**

Agenda



1. Milkyway schema version update
2. Hierarchical flow support in Milkyway
3. Bus character support enhancement for `get_ports`
4. ILM support in `read_verilog`
5. Archive design enhancement
6. Obsolete UI commands in 2010.03

Milkyway Schema Version Update

- Overview
 - Every Milkyway database release has a schema version
 - For version 2010.03, the Milkyway schema version is 5.0
 - The new schema changes enable
 - Feature enhancements for UPF
 - Enhancements for future releases
 - These changes are very small in scope
 - Similar to the 2009.06 schema changes

Milkyway Schema Version Update

IC Compiler /Milkyway release version	Schema Version
2010.03	5.0
2009.06	4.0
2008.09	3.2
2007.12	Pre-3.0

Milkyway Schema Version Update

- Database version conversion
 - To convert an old database version to new schema version 5.0
 - Explicit conversion with `convert_mw_lib`
 - Automatic conversion with `open_mw_cel`
 - *Remember to use `save_mw_cel -as` (or `-increase_version`) to save converted database to disk if using automatic conversion*
 - To convert version 5.0 back to previous version (4.0)
 - Explicit conversion with `convert_mw_lib -previous`
 - Auto conversion with `save_mw_cel -previous`

Note:

- *Conversion back to old version supports only one version back a time, such as converting 5.0 to 4.0*
- *Direct conversion of 5.0 back to 3.2 is not supported*

Milkyway Schema Version

Between 2009.06 and 2010.03

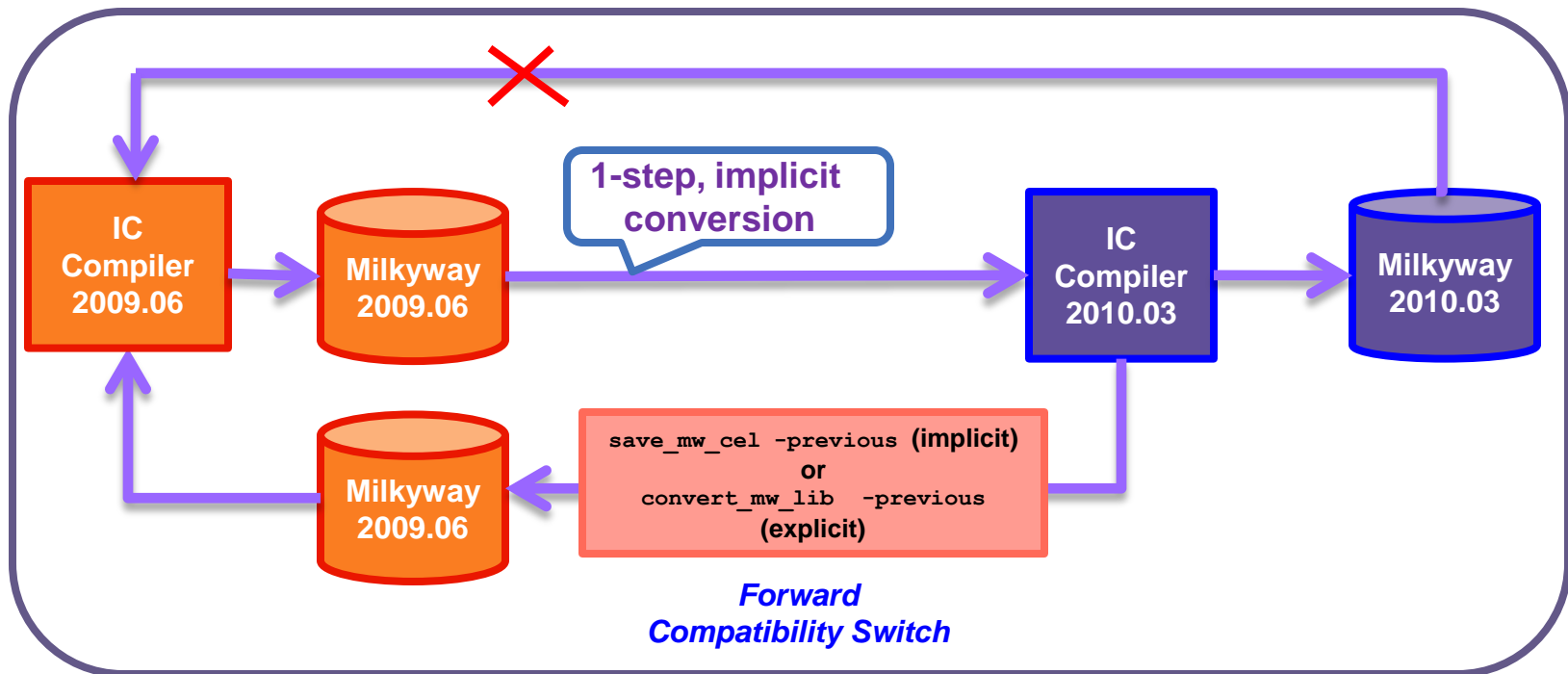
ICC/MW Version	Schema Version
2007.12	Pre-3.0
2008.09	3.2
2009.06	4.0
2010.03	5.0



-- Database



-- Executable



2009.06 → 2010.03: 1-step, implicit conversion
 2010.03 → 2009.06: 1-step, explicit conversion

Milkyway Schema Version

Between 2008.09 and 2010.03

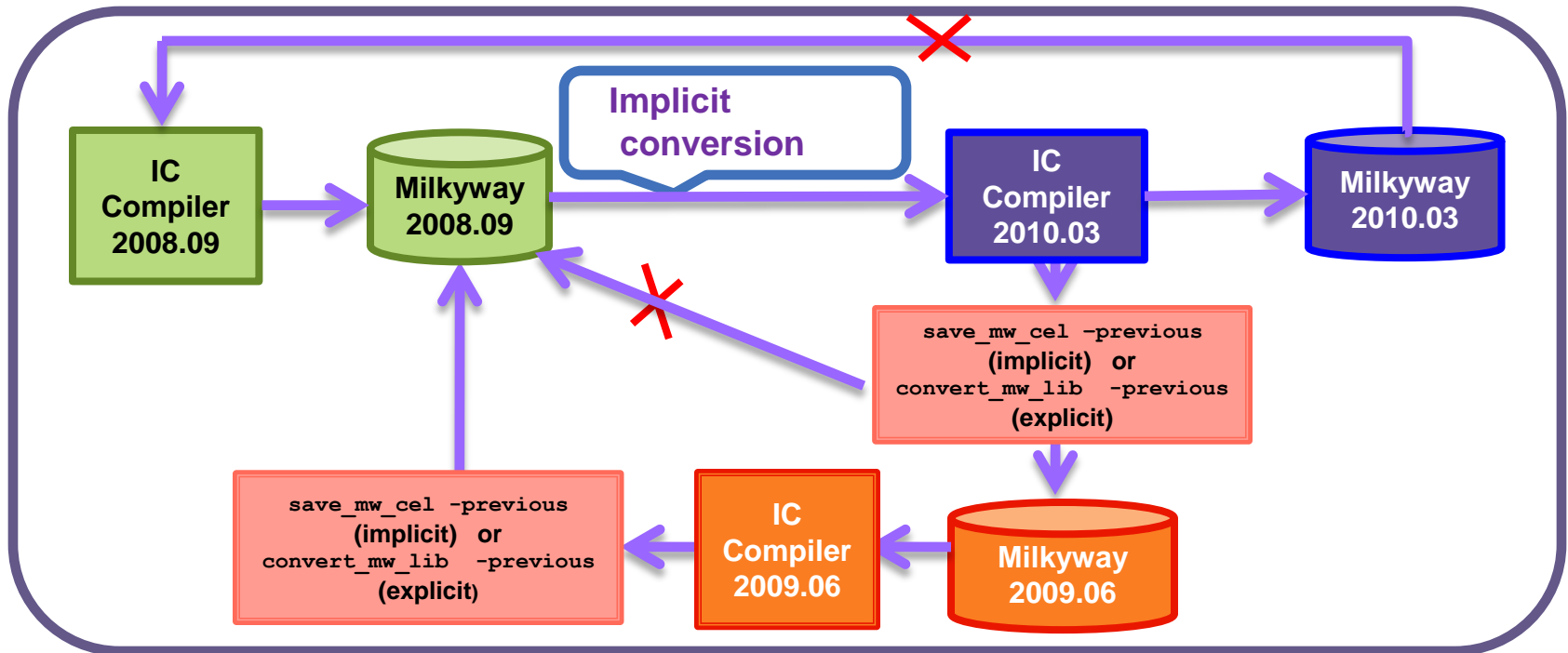
ICC/MW Version	Schema Version
2007.12	Pre-3.0
2008.09	3.2
2009.06	4.0
2010.03	5.0



-- Database



-- Executable



2008.09→2010.03: 1-step, implicit conversion
 2010.03→2008.09: 2-step, explicit conversions

* **Explicit conversion is recommended to save and also to get the full benefits of new features**

Milkyway Schema Version Update

- Flow Recommendation
 - Use explicit conversion with `convert_mw_lib` instead of automatic conversion
 - You should save a copy of the design before converting the design to the new version

Client Tool Releases

Supporting The New v5.0 Schema

Client Tool	Release Version
IC Compiler	2010.03
Design Compiler	2010.03
Formality	2010.03
PrimeYield LCC	No Plan
Hercules	No Plan
IC Validator	2009.12-SP1 (June 2010)
PrimeRail	2009.12-SP1 (March 2010)
StarRC	2010.06

Client Tool	Release Version
Prime Time PrimeTime-SI	2010.06
Library Prep	2010.03
Milkyway MAP-in	2010.03 (June 2010)
APF Family (Astro, JXT, AstroRail)	No Plan
GCA	Does not read Milkyway database
MVRC (MVTools)	Does not read Milkyway database
Custom Designer	2011.06

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for `get_ports`

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Hierarchical Flow Support in Milkyway

- Overview
 - Make the top-level instance port names match with newly updated child cell port names
- UI
 - New option:
 - `open_mw_cel -sync_port_names TOP.CEL`
- User Benefit
 - Preserves the hierarchical flow if the port name is changed in the child cell
 - By using the new `-sync_port_names` option, the port names are synched to prevent a broken flow
 - The `sync_port_names` option is useful for a hierarchical flow where the port instance names on the top-level design would be synched with the referenced block-level design. The option is also supported for ILM's.

Port Name Change in Hierarchical Flow

- Usage Model
 - When updating the boundary port information in the child cells (soft macros or ILMs) by using `change_names`, the updated information is not yet synched up between the top-level design and the child cells
 - You need to update the hierarchy by using the following flow
 - Save and close the current child cell
 - If the top-level design is open, close the top-level design
 - Reopen the top-level design with
`open_mw_cel -sync_port_names`

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Bus Character Support Enhancement for `get_ports`

- In IC Compiler 2009.06 and earlier releases, when querying bus port, `get_ports` returns objects even they are not a bus

For example, B[1] and B[2] are ports with square brackets in their name, but are not bus ports.

```
icc_shell> get_ports B
{B[1] B[2]}
```

- Starting with version 2010.03, `get_ports` checks if the ports are real bus ports and does not return ports that are not bus ports

– To get the non-bus ports above, you need to specify the full name:

```
# The following command returns nothing because there is no real bus port B
icc_shell> get_ports B
Warning: No port objects matched 'B' (SEL-004)
```

```
# To query the ports B[1] and B[2], which have a name that looks like a
# bus, you need to use the exact name in the input argument
icc_shell> get_ports {B[1] B[2]}
{B[1] B[2]}
```

```
# The following command returns bus port C
icc_shell> get_ports C
{C[1] C[2] C[3]}
```


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- ➔ 4. ILM support in **read_verilog**
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ILM Support in read_verilog

- Overview
 - In previous releases, `read_verilog` got bus information for leaf cells from the `.db` library. In the hierarchical flow, a soft macro does not have a `.db` library, so `read_verilog` failed to get the correct bus information
 - We have enhanced `read_verilog` to get the correct bus information from the ILM
 - No UI change
- User Benefits
 - This is useful for the hierarchical flow, because `read_verilog` gets the correct bus information from ILMs
- Known Limitations and Migration update
 - If a module is not defined in Verilog, but is referenced from the FRAM view and contains only a 1-bit bus port, `read_verilog` might still fail even though ILM view is available.

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-  5. **Archive design enhancement**
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Archive Design Enhancement

- Overview

- When archiving a large design, it is expensive to archive the entire design and its dependencies
- We have new capabilities to optimize the archiving runtime

- UI

- New options are added to the `archive_design` command


- `archive_design -update_archive`
- `archive_design -include`
- `archive_design -exclude`

Note that `-include` and `-exclude` are mutually exclusive

Archive Design Enhancement

- User Benefit
 - Introduces new capabilities to the archive design feature to improve archiving runtime
 - If the design has been archived before, updating capability is used to avoid copying unchanged design cells again
 - Provides include and exclude control capability for archiving a subset of the design views

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Obsolete Design-Related Commands

- Obsoleted some design-related commands
 - The following commands are obsolete in IC Compiler 2010.03:
`set_design_top`
`set_design_license`
`sub_designs_of`
`get_designs`
`list_designs`
`create_design`
`rename_design`
`compare_design`
- Why were these commands removed?
 - These design-related commands are inherited from Design Compiler
 - They are either not supported well in IC Compiler or have a replacement in IC Compiler

Obsolete Design-Related Commands

- Recommended Usage
 - You should do a design-related operations, such as creating a design or renaming a design, in Design Compiler
 - `get_designs` is removed, use `all_designs` with `filter_collection` (if necessary) instead

In 2009.06 and previous releases	In 2010.03 release
<code>rename_design</code>	<code>set_name -top_design</code>
<code>set_fix_multiport_nets [get_designs *]</code>	<code>set_fix_multiport_nets [all_designs]</code>
<code>get_designs CI_FIFO_*</code>	<code>filter_collection [all_designs] -regexp {name=~"PCI_FIFO_.*"}</code>
<code>get_designs -nocase pci*</code>	<code>filter_collection [all_designs] -regexp {name=~"[Pp][Cc][Ii].*"}</code>
<code>create_design</code>	<code>create_cell -hierarchical</code>

group and ungroup Commands Deprecated

- Overview
 - Prior to 2010.03, IC Compiler had two command pairs for design hierarchy manipulation:
 - `group`, `ungroup`
 - `merge_fp_hierarchy`, `flatten_fp_hierarchy`
 - In 2010.03 release, `group` and `ungroup` have been deprecated
 - `merge_fp_hierarchy` and `flatten_fp_hierarchy` are recommended for design hierarchy manipulation
- User Benefit
 - One focused command set for design hierarchy manipulation

Obsolete *_design Commands (Applies Only to Milkyway Environment Tool)

- In the Milkyway Environment tool 2009.06 releases, all of the *_design commands were hidden with the following warning message:

```
Warning: Detected use of obsolete/unsupported feature. The following will not be available in a future release of the application: %s. Use %s instead (CMD-100)
```

- In version 2010.03, these hidden commands have been removed:

```
open_design  
close_design  
current_design  
copy_design  
save_design  
create_design  
remove_design  
get_designs  
rename_design  
report_design  
update_design
```

Obsolete *_design Commands (Applies Only to Milkyway Environment Tool)

Obsolete commands	Alternate commands
<code>open_design</code>	<code>open_mw_cel</code>
<code>close_design</code>	<code>close_mw_cel</code>
<code>current_design</code>	<code>current_mw_cel</code>
<code>copy_design</code>	<code>copy_mw_cel</code>
<code>save_design</code>	<code>save_mw_cel</code>
<code>create_design</code>	<code>create_mw_cel</code>
<code>remove_design</code>	<code>remove_mw_cel</code>
<code>get_designs</code>	<code>get_mw_cel</code>
<code>rename_design</code>	<code>rename_mw_cel</code>
<code>report_design</code>	<code>report_mw_cel</code>
<code>update_design</code>	<code>update_mw_cel</code>
<code>get_libs</code>	<code>get_physical_libs</code>
<code>get_lib_cells</code>	<code>get_physical_lib_cells</code>
<code>get_lib_pins</code>	<code>get_physical_lib_pins</code>

The `-design-id` Option Removed from the `get_*` Commands

- Overview
 - The `-design_id` option is inherited from the Milkyway Environment tool.
 - The Milkyway Environment tool can support multiple designs. However, IC Compiler support searching for objects only in the current design.
 - This option actually does not work in IC Compiler
 - In version 2010.03, this option is hidden in both the Milkyway Environment tool and IC Compiler; the MWUI-998 warning message is issued if you use the option.
 - This option will be removed in future release.

Summary of Milkyway Enhancements

- Milkyway schema version updated to 5.0 (for UPF as well as future enhancements)
- Hierarchical flow support in Milkyway for synchronizing the port instance names on the top-level design with the referenced block-level design for the `open_mw_cel` command.
- Bus character support enhancement for `get_ports`
- ILM support in `read_verilog` (gets bus information from referenced ILMs)
- New capabilities introduced to optimize the design archival process
- Commands that were obsoleted in 2010.03

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