Proposal for Library Interoperability Project

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Motivation

- Complexity of design flows and tools
  - Multiple library views for increasing number of tools
- Expensive library preparation
  - Frequent version change of tool-specific libraries
- Advantages of standard library description
  - Reduced cost, increased quality
  - Resource and time saving for library creation and validation, leverage 3rd party library sources
  - Facilitate tool interoperability
  - Anticipate and prepare for technology innovations

Situation

- .lib and ALF are the strongest proponents for a library standard
  - Harmonization between .lib and ALF will avoid fragmentation
- .lib is the most popular library format today
  - De-facto standard for commodity libraries
  - Supported by virtually every EDA tool in RTL-to-GDSII space
  - Extensions proposed to address advanced modeling issues
    - Noise, electromigration …
- ALF is the most comprehensive library format today
  - Approved IEEE standard
  - Designed to support library modeling for next generation applications
  - Supported by sizable number of EDA tools today
    - power, signal integrity, RTL prototyping …

Work done so far

- Informal study group for library interoperability formed
  - Investigate interest and feasibility of .lib/ALF harmonization
  - Study commonalities and differences between ALF and .lib
- 3 exploratory meetings held
  - Purpose: to explore interest and support from EDA and user community
  - Participation: Synopsys, Cadence, Mentor, HP, Infineon, NEC, SiliconMetrics, Fujitsu, ASC
  - Result: established a prioritized list of library items
    - Highest priority: timing, power, noise, electromigration
- 4 expert meetings held
  - Purpose: to study the technical issues in detail
  - Participation: NEC, Synopsys, ASC Inc.
  - Result: created sample library in both formats
    - Containing data of the highest priority category

Plan

- Phase 1
  - Establish a formal cross-reference between .lib and ALF
    - Specification of common semantics
    - Mapping table between .lib and ALF
    - Sample library templates
  - This work has already started
    - Can be completed within 6 months
- Phase 2
  - Develop reference tools/utilities
    - Solicit donations from EDA vendors and users
    - “golden” parser with API suitable for application development
    - Bi-directional translators

Request to Accellera

- Take ownership of this project
  - Establishment of Accellera work group
- Tangible Benefits
  - Streamlines and facilitates library generation for new technologies
  - Promotes and enhances both ALF and .lib
    - ALF is the Accellera-endorsed library foundation
    - .lib is widely used in the industry, including Accellera members
  - Well in line with other Accellera work in IC implementation space
    - Verilog/VHDL, SDF, SPEF helps digital IC implementation today
    - OK will help with custom IC implementation in future
- Low Cost
  - Little or no funding required in phase 1
    - WG can develop and edit the document
  - Funding for phase 2 depends on technology donations