Libx2y: Liberty Timing View Generation and Validation
Release date: October 28, 2012

Brief History of Cell Characterization: NLDM is still used today and has been around for many decades and now its black box current source models which are getting popularity in SOC houses. As far as the accuracy of STA tool for timing is concerned current source models still suffer due to the following:

1- Ramps are still propagated through interconnect and not the entire sampled waveform which causes some loss in accuracy
2- Clock/Data testing still uses NLDM format. We don’t have complete current source models for each cell in library.
3- Many different interfaces exist between liberty delay view calculations and interconnect simulation leading to possible loss of accuracy.
4- Current source models although of a black box nature but still lack the information of voltage or current transfer functions at cell level. Generating this information for model validation from characterization data for timing tool has some impact in accuracy.
5- Downstream optimization tools in physical design flow do not use current source models effectively; thereby the benefits of the characterization technology are not fully leveraged across other tools.
6- Current source models should be accurate in principle, but the enormous size of data, missing current source model data for testing paths, existing delay differences in NLDM and current source models make it impossible for companies who lack in-house CAD experience to benefit from current source technology.
7- Characterization flows for multiple switching inputs, inaccuracy in manually configuring the intermediate internal channel connected components (e.g. adders etc.) still need to be addressed.
8- Additional characterization efforts are needed to make current source models spice accurate so that simple spice engines can work seamlessly across characterized current source models. This has to happen in coming years.

➢ Tool Capabilities:

- Inputs :
  - ECSM, NLDM or CCSM Liberty Timing Views
  - User Control File
- Output:
  - Path Report for each Cell with Sampling Errors across Views
  - Compact Delay Paths Database
  - Certification of Characterized View by Validating Threshold Points

✓ Conversion of ECSM views to CCSM views
✓ Conversion of CCSM views to ECSM views
✓ Reports characterization error in cells with associated paths
✓ Fix reported delay paths
✓ Compact Cell and Path database