

Translating IBIS Files to Simulator Specific Model Formats

National Semiconductor Corp.
Interface Products Group

Introduction

In order to use an IBIS file in a Signal Integrity simulator, it is often required to translate the IBIS file to the simulator specific model file format. This paper describes how to translate an IBIS file for two popular Signal Integrity simulators, Mentor Graphics XTK and Cadence Signal Explorer.

Translating an IBIS file to a XTK Model Format

In order to translate the IBIS file to a XTK model format, the program 'ibis2xtk' must be used. This program is provided with XTK and can be run from the command prompt. (If the pre-layout tool Scratchpad is used, then the IBIS file is automatically translated to XTK format using the ibis2xtk program when simulated.) XTK model files are often referred to as Quad model files, dating back to when XTK was first developed. The following command is used at the command prompt to translate an IBIS file to XTK format:

```
ibis2xtk ibis_filename.ibs → Command line syntax to run ibis2xtk program
```

In the same directory as the IBIS file, a log file is created and the XTK model file is created. By default, the ibis2xtk program translates the typical IBIS data only. To translate the minimum or maximum data in the IBIS file, the following syntax is used:

```
ibis2xtk -min -min_pkg -min_ccomp filename.ibs → Command line syntax to run  
ibis2xtk program for a minimum IBIS file
```

Since an IBIS file can contain the typical, minimum, and maximum data, the same file can be used to create all of the XTK model files. The ibis2xtk program will name each XTK model file as ibis_filename.process, using the same filename as the IBIS file. For the typical data, this would be ibis_filename.typ. The log file should be reviewed to ensure that no errors were encountered in the translation process.

When translating some LVDS IBIS files, an issue can occur where the ibis2xtk program will default to using only the Ramp data in the IBIS file and ignore the V/T data. This can happen when the LVDS output buffer in the IBIS file is defined as a 3-State Output model. The ibis2xtk program checks to see if the V_fixture parameter in the V/T data is within .7V of Vcc or -Vss. This was originally intended for TTL devices that use a V_fixture of Vcc and GND for the V/T data. Most LVDS devices use a V_fixture of 1.25 V, normally the Vos of the device. In order for ibis2xtk to use the V/T data in the translated XTK model (which is more accurate than the Ramp data), the option -no_rfchk can be used at the command line that will bypass this check.

Other options are available at the command line when translating an IBIS to XTK model format. One useful option is -wvi, which puts all of the IBIS data into a waveviewer file that can be viewed in XTK.

Translating an IBIS file to a Cadence DML Model Format

Translating an IBIS file to a Cadence Signal Explorer model format follows almost the same procedure as the one to translate to an XTK model format. Cadence Signal Explorer model files are referred to as DML model files, which stands for Device Model Language. Signal Explorer uses a command line program, 'ibis2signoise', to translate IBIS files. (IBIS files can also be automatically translated to DML files using the ibis2signoise program under the Signal Analysis Library Browser) The following command is used at the command prompt to translate an IBIS file to DML format:

ibis2signoise filename.ibs → Command line syntax to run ibis2xtk program

In the same directory as the IBIS file, a DML model file will be created. Unlike the XTK program, all of the process corner data is translated at once using the ibis2signoise program. By default, the ibis2signoise program labels the DML file as ibis_filename.dml. Different options are available to name the DML model. If any errors are found, then a .txt file will be created in the same directory as the IBIS file.

There are other options available when translating the IBIS file to DML model format. One useful option is `-curvedir dir` (where 'dir' is a defined folder name), in which ibis2signoise will create a SigWave file that contains all of the IBIS data so it can be easily viewed.

Summary

This paper described how to translate an IBIS file to two popular simulator model formats, QUAD and DML. Understanding how an IBIS file is translated into a different model format is important to ensure that the translated model is accurate.

References

XTK User's Guide, Version 2000.4. Innoveda.

SpectraQuest Simulation and Analysis Reference, Version 14.2. Cadence.