IBIS Quality Report

A progress report of the IBIS Quality Task Group
Mike LaBonte, Cisco Systems
IBIS Summit Meeting, 5 June 2007
Regular IQ Meeting Participants

- David Banas, Xilinx
- Moshiul Haque, Micron Technology
- Kim Helliwell, LSI Logic
- Mike LaBonte, Cisco Systems, chair
- Eckhard Lenski, Siemens
- Roy Leventhal, Leventhal Design & Communications
- Bob Ross, Teraspeed Consulting Group
Brief History

- Barry Katz started IBIS-Quality in March 2002
- Review of 1.0 IQ specification completed October 2004
- IQ checklist released October 2004
- Parser bug 90 submitted and approved August 2005
- Parser bug 94 submitted and approved March 2006
- Book “IBIS Model Creation & Validation” discusses IQ
- Version 1.1 IQ specification initiated August 2006
Specification Version 1.1

- IBIS Quality Levels
  - IQ0 – Not Checked
  - IQ1 – Passes IBISCHK
  - IQ2 – Suitable for Waveform Simulation
  - IQ3 – Suitable for Timing Analysis
  - IQ4 – Suitable for Power Analysis

- Special Designators
  - S – Simulation correlated
  - M – Measurement correlated
  - X – Exceptions
IQ Check Example

3.2.5 {LEVEL 3} [Pin] RLC parasitics are present and reasonable

For a LEVEL 2 model, pin parasitics are optional, but they are mandatory for a LEVEL 3 model (that is, a model suitable for timing). To pass this check the RLC values must be present for all signal pins in the [Pin] section, or [Package Model] must be present. Pin parasitics should either be measured or extracted using a 2D or 3D solver. Reasonable signal pin parasitics will result in impedance and delay characteristics that fall in the ranges:

\[
\begin{align*}
\text{TD} &= \sqrt{LC} < 300\text{ps} \\
\text{Z}_0 &= \sqrt{L/C} < 100\text{ohm}
\end{align*}
\]

Note that IQ check 3.1.2. also requires that each [Pin] RLC value falls within the min/max range as given by the [Package] keyword. The [Package] keyword can be adjusted to accommodate.
Current Activities

- Working on feature-selective validation for correlation
- Reviewing IQ checks
  - Updating to new level numbering system
  - Rationale documented to avoid future confusion
  - Last reviewed check 3.3.4, end of [Diff Pin] section
  - Jumped ahead to discussion of [Receiver Thresholds]
Summary of 1.1 Review Progress

- 2.0 General Header Section
  - 8 of 8 checks reviewed
- 3.0 Component Section
  - 17 of 19 checks reviewed
- 4.0 Model Section
  - 0 of 68 checks reviewed
- 5.0 Possible Errors
  - Needs rework, maybe a name change
- 6.0 Correlation
  - David and Roy working on this
- 7.0 Model Limitations and Model Maker Notes
  - ???
IBIS Quality Task Group

- Web:
  http://www.vhdl.org/pub/ibis/quality_wip

- Email list:
  http://www.freelists.org/list/ibis-quality
    – Or send email
    To: ibis-quality-request@freelists.org
    Subject: subscribe

- Meetings:
  – Tuesdays from 11:00am to 12:00pm Eastern Time

- Questions? Mike LaBonte milabont@cisco.com