The Direction of IBIS as a Standard

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IBIS Development

- Restructuring of specification
- Gate modulation power delivery
- Links to ICM for packages

- Analog-only support (Verilog-A)
- Fixes for standardization

- Links to Verilog-AMS, VHDL-AMS and Berkeley SPICE files
- Differential thresholds, loads

- New meas. & delay loads
- Golden Waveforms and loads

- All IBIS 2.1 features
- Package modeling
- Series devices
- Scheduled drivers

* ANSI standard
‡ will be submitted for ANSI std.
The Expansion of IBIS

To support new circuit design technologies, IBIS has grown and will continue to grow.
Industry Needs Are Changing Again

- Today’s IBIS Technology Enables Today’s Analysis Methods
  - Single-ended, source-synchronous interfaces slower than 1 GHz
  - Setup and hold timing equations using pin measurements
  - Worst-case corners analyzed using a few hundred or thousand bits
  - Tools process analog waveform data taken at pins, pads

- Newer Technologies Suggest New Techniques
  - Differential, low-swing interfaces at 1 GHz and above
  - Eye diagram and statistical, BER analyses using 1e5, 1e6+ bits
  - Response of entire channel is often analyzed as a unit
  - Models are usually linear and may even support digital logic

![Diagram of IBIS model and waveform analysis](image)
How Do We Support the New Methods?

- A new discussion in the IBIS Advanced Technology Modeling group
  - Expand IBIS to include an API (application programming interface)
  - The API would link to external C code for signal processing analysis
  - Example: clock data recovery and bit-error rate (BER) estimation
  - Similar effort underway in VHDL (IEEE 1076c)
- This would expand IBIS beyond circuits into systems
How Do We Support the New Methods?

PROPOSAL

API
Signal & Data Processing Algorithms

IBIS
TX
Package

Tool or ICM models

RX
Package

IBIS

API
Signal & Data Processing Algorithms

Tool control & evaluation
Critical Choices

- Should IBIS remain a circuit analysis standard or expand to systems?
  - Would creating a new specification be more appropriate?

- Is an API needed?
  - AMS languages under IBIS can support complex equations
  - Can the AMS languages handle these new analysis needs?

- Where should the “model” end and the “tool” begin?
  - Both AMS and an API would allow analysis procedures inside a model
  - Should models include both circuit functions and tool functions?
  - Example: tool or model API/AMS code could handle BER estimation

This issue will be discussed at this Summit and arises frequently in the IBIS community.

Your opinion matters!
References

• Official IBIS Website, including tools, articles, IBIS & ICM specs
  – http://www.eigroup.org/ibis/

• The IBIS 4.0 Cookbook – recommended for model creation!
  – http://www.eda-stds.org/ibis/cookbook/

• IBIS Summit presentations
  – http://www.eda-stds.org/ibis/summits/index-bydate.htm

• Accelera* Verilog-AMS Working Group
  – http://www.eda-stds.org/verilog-ams/

• IEEE* 1076.1 (VHDL-AMS) Working Group
  – http://www.eda-stds.org/vhdl-ams/

• Behavioral Modeling and Simulation Conference 2006

• On-line signal integrity classes & references

• Join the IBIS and IBIS-Users e-mail reflectors!