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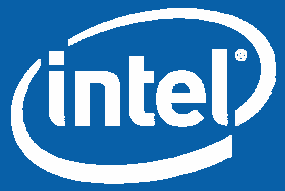

IBIS Enhancement Priorities:
Differential Pins and Measurements as an Example

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Current Enhancements Pending Version 5.0

BIRD Number	Title	Description	Approved?
104	Algorithmic Modeling API (AMI) Support in IBIS	Support for code-based algorithmic models	WIP
103	[Model Spec] DDR2 Overshoot/Undershoot Parameters	Support for DDR2 JEDEC specification measurements	YES
98.3	Gate Modulation Effect (table format)	Model gate modulation using tables	WIP
97.2	Gate Modulation Effect	Alternative to 98.3, using formulae	WIP
95.6	Power Integrity Analysis using IBIS	I-T tables and rail impedance data	YES
76.4	EMI Parameters	Support for emissions limits & analyses	YES

Are these sufficient to keep IBIS relevant?

Complaints from an Informal Survey

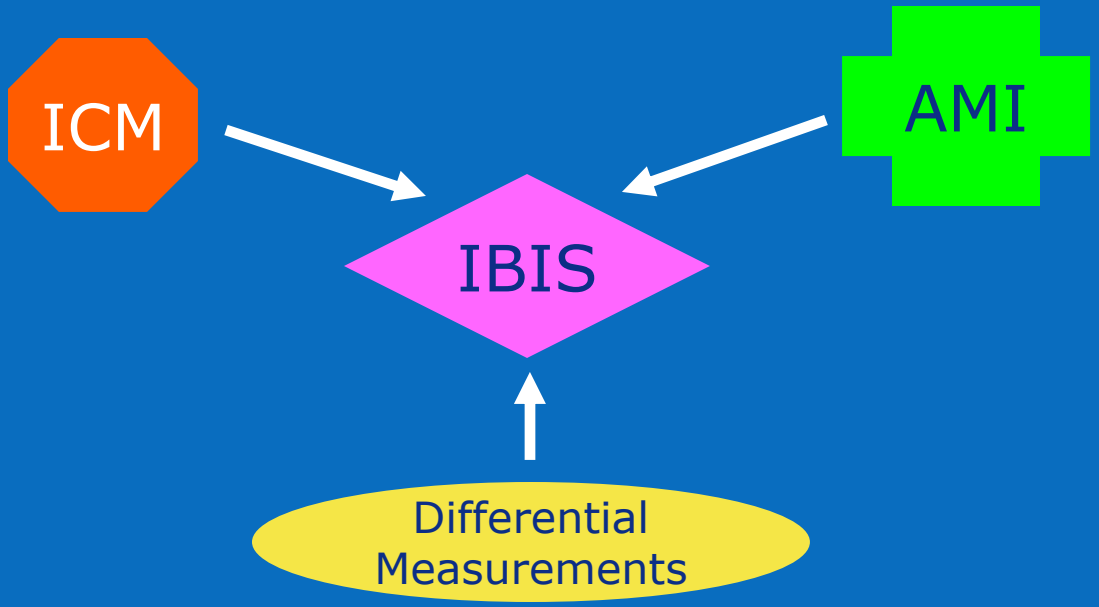
- Buffer Control/Sweeping
  - Limited flexibility for varying R-on, ODT, slew rate, linearity, clamping, etc.
- Model Behavior
  - No R-die modeling (e.g., DDR uses a series RC instead of C_comp)
  - Need universal switching-into-unfinished-edge and supply scaling solutions.
  - Improved data-dependency modeling needed (both for DDR and SerDes).
  - Need to include pre-driver current draw for SSO analysis.
  - Pre-/De-emphasis nearly impossible to model correctly using tables.
- Package Modeling
  - IBIS package modeling "lame" and often ignored.
- General
  - Insufficient differential measurement parameters (e.g., eye masks)
  - "IBIS" perceived as always table-driven and therefore inaccurate.

To these users, recent enhancements (e.g., BIRD95, multi-lingual) are not well-known and some long-standing problems are still not fixed.

Changes Becoming Tougher…

- Changes are becoming tougher as the specification grows
  - 100% backward compatibility becoming harder to maintain
  - Enhancements touch or "step on" other keywords, usage models

- Example: three recent, separate proposals to enhance IBIS…



Examples of Colliding, Complex Proposals

- Add ICM Support to Traditional IBIS (Mirmak - 2005)
  - To support 1-to-1 [Pin] to [Model] mapping, [Package Model] expands
    - ICM becomes just like external PKG for packages
  - To support N-to-1/1-to-N [Pin] to [Model] mapping is much harder
    - Add a column to [Pin] for [Model] instance name (i.e., a *pad* name)
    - Add SPICE-like syntax to ICM describe how ICM pins map to IBIS pins
- Add Differential Eye Masks to IBIS (Katz, Muranyi, Mirmak - 2007)
    - Add [Diff Spec] to describe eye mask and BER requirements
    - [Diff Pin] expands to allow multiple [Diff Spec]s per pair
    - [Diff Spec] overrides [Model Spec] & [Receiver Thresholds]!
    - OR Add [Pin] column for new [Diff Model] plus indicate polarity
    - OR New [Diff Model] overrides [Diff Pin] and/or [Model]
- BIRD 104 AMI Proposal (IBIS-ATM – 2007)
  - [Algorithmic Model] assumed differential, but under [Model]

Which is worse: updating old keywords, removing them entirely or adding new "override" keywords?

Key Questions for the Open Forum

- To keep IBIS relevant, we need to…
  - … fix the biggest issues for the most important sectors of the IBIS community.
  - … ensure that existing solutions/options are understood and accurately perceived.
- What are the most pressing industry needs?
  - Are the pending BIRDs the most important enhancements to pursue?
  - On which missing features should the Open Forum spend its scarce time?
    - *Adding more features means additional delay in releasing 5.0…*
  - Proposal: differential eye templates, ICM-for-IBIS-packages
- Related: what is the IBIS "market segment" of highest interest?
  - Some companies need advanced technologies supported (e.g., PCI Express* Gen. II)
  - Other companies need older, commodity technologies enhanced (e.g., USB, DDR)
  - Helping one may hinder the other (e.g., changing [Pin], [Diff Pin])
- How can we best address the perception problem?
  - In some quarters, "IBIS" = "table models" = "inaccurate"
  - Would a name change or a parallel streamlined advanced specification address this?

As always, we need to keep IBIS compelling in comparison to non-standard alternatives!