Introducing IBIS 6.0

Michael Mirmak
Intel Corp.
Chair, IBIS Open Forum

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http://www.eda.org/ibis/
Agenda

- IBIS 6.0 in Summary
  - Key Features
  - Changes from IBIS 5.1
- What problems does 6.0 address?
- Issues to Resolve
- What’s Next?
- Questions
Key Features of IBIS 6.0

- IBIS 6.0 was approved September 20, 2013

- Major additions focus on IBIS-AMI
  - Adds redriver and retimer support
  - Expands jitter/noise parameters
  - Clarifies analog buffer impedance descriptions
  - Supports IBIS-ISS (Interconnect SPICE Subcircuits) and Touchstone 1.x/2.0
Other Changes from IBIS 5.1

- Clarifications of A/D and D/A converters in [External Model] and [External Circuit]
  - Parameter passing now supported!

- Additional files supported for IBIS-AMI
  - Including explicit paths
  - Identifiers for individual IBIS-AMI model instances

- List Tips for IBIS-AMI Lists
  - Associates labels with parameter lists

- Improved organization of the document
  - Easier to read and use
IBIS 6.0 Support Examples

How do I model a mid-bus repeater?

- Recall the repeater types: retimers and redrivers
- Think of redriver as filtering and/or amplifying analog signals
- Think of retimer as using clock-data recovery to re-transmit data
IBIS 6.0 Support Examples

How do I model a mid-bus repeater?

- Use [Repeater Pin] to identify RX and TX pins
- Define “Redriver” or “Retimer” in the .ami parameters file under “Repeater_Type”
- For Retimers, ensure AMI_GetWave is defined and included

*from the IBIS 6.0 specification*
IBIS 6.0 Support Examples

- Where to “put” the analog impedance of the buffer?
- What if I can’t easily represent the analog behavior of my buffer using traditional IBIS?
  - In 6.0, use IBIS-ISS to represent complex analog buffer behavior
  - Traditional IBIS becomes ideal (TX or RX)

Concept

Implementation

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What if your algorithmic model isn’t a single file?

- Multiple files, in different locations, now supported
- From the .ami parameters file...

(Supporting_Files (Usage_Info) (Type String)
  (Description "Additional files and directories required by this model")
  (Table
    ("this_directory")
    ("custom_functions.dll")
    ("that_directory/core_functions.dll")
  )
)

EDA Tool

IBIS-AMI
Algorithmic Model
DLL

.ami Parameters File

"this_directory"
(all files)

custom_functions.dll

"that_directory"
core_functions.dll

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Issues to Resolve

Ensuring true IBIS-AMI model compatibility

- Some models under IBIS 5.x place buffer analog information in the executable (DLL or SO file)
- This may be a problem for some tools
- Use of IBIS 6.0 improved analog modeling can help ensure portability
Issues to Resolve

- Ensuring true IBIS-AMI model compatibility
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Issues to Resolve

- Improving IBIS packages
  - Two separate approaches being discussed
  - Objective is to finalize a package model format that...

  - Can interact with IBIS and related files
  - Supports time- and frequency-domain modeling data in IBIS-ISS format
  - Supports arbitrary numbers of crosstalking signal lines in individual segments

- Target is to include this in the next major IBIS release
What’s Next?

- A parser: IBISCHK6
  - Check new keyword syntax
  - Check new IBIS-AMI parameter syntax
  - Simple checks for IBIS-AMI DLL/SO executables?
    - Are the required IBIS-AMI functions present?
    - Do the functions execute (instead of crashing)?

- Is a parser for IBIS-ISS required?
  - SPICE features used in IBIS-ISS are very common across EDA tools

- IBIS version updates
  - IBIS continues to target updates twice per year
Questions?