IBIS Chair’s Report

Randy Wolff
Micron Technology
Chair, IBIS Open Forum

IBIS Summit at 2020 IEEE Virtual Symposium on EMC+SIPI
August 28, 2020
27 IBIS Members (Organization-based)
Organization

IBIS Officers 2020-2021

Chair:  Randy Wolff, Micron Technology
Vice-Chair:  Lance Wang, Zuken USA
Secretary:  Curtis Clark, ANSYS
Treasurer:  Bob Ross, Teraspeed Labs
Librarian:  Anders Ekholm, Ericsson
Postmaster:  Mike LaBonte, SiSoft (MathWorks)
Webmaster:  Steve Parker, Marvell
IBIS Meetings

• Weekly teleconferences
  • Quality task group (Tuesdays)
  • Advanced Technology Modeling (ATM) task group (Tuesdays)
  • Interconnect task group (Wednesdays)
  • Editorial task group (some Fridays)

• IBIS Open Forum teleconference every 3 weeks

• IBIS Summit meetings (USA and international)
  • DesignCon, IEEE SPI, Shanghai, Taipei, Tokyo (JEITA-organized), IEEE EMC+SIPI

• Participants: 368 in 2019
SAE ITC

• SAE Industry Technologies Consortia is the parent organization of the IBIS Open Forum
• IBIS is assisted by SAE employees José Godoy, Phyllis Gross, Laurie Strom
• SAE ITC provides financial, legal, and other services
• http://www.sae-itec.org/
Task Groups

- **Interconnect Task Group**
  - Chair: Michael Mirmak, Intel
  - [http://ibis.org/interconn_wip/](http://ibis.org/interconn_wip/)
  - Develop on-die/package/module/connector interconnect modeling BIRDs

- **Advanced Technology Modeling Task Group**
  - Chair: Arpad Muranyi, Mentor, A Siemens Business
  - [http://ibis.org/atm_wip/](http://ibis.org/atm_wip/)
  - Develop most other technical BIRDs

- **Quality Task Group**
  - Chair: Mike LaBonte, SiSoft (MathWorks)
  - Oversee IBISCHK parser testing and development

- **Editorial Task Group**
  - Chair: Michael Mirmak, Intel
  - [http://ibis.org/editorial_wip/](http://ibis.org/editorial_wip/)
  - Produce IBIS Specification documents

BIRD = Buffer Issue Resolution Document
IBIS Milestones

I/O Buffer Information Specification

- 1993-1994 IBIS 1.0-2.1:
  - Behavioral buffer model (fast simulation)
  - Component pin map (easy EDA import)

- 1997-1999 IBIS 3.0-3.2:
  - Package models
  - Electrical Board Description (EBD)

- 2002-2006 IBIS 4.0-4.2:
  - Receiver models
  - AMS languages

- 2007-2012 IBIS 5.0-5.1:
  - IBIS-AMI SerDes models
  - Power-aware models

- 2013-2015 IBIS 6.0-6.1:
  - PAM4 multi-level signaling
  - Power delivery package models

- 2019 IBIS 7.0:
  - Back-channel support
  - Interconnect modeling using IBIS-ISS and Touchstone

- 2020-2021 IBIS 7.1 (in progress)

Other Work

- 1995: ANSI/EIA-656 (International standard)
  - IBIS 2.1

- 1999: ANSI/EIA-656-A (International standard)
  - IBIS 3.2

- 2001: IEC 62014-1 (International standard)
  - IBIS 3.2

- 2003: ICM 1.0
  - Interconnect Model Specification

- 2006: ANSI/EIA-656-B (International standard)
  - IBIS 4.2

- 2009: Touchstone 2.0
  - Official Touchstone donated from Agilent/Keysight

- 2011: IBIS-ISS 1.0
  - Interconnect SPICE Subcircuit specification (subset of HSPICE)

- IBISCHK: IBIS file syntax parser
  - Current version 7.0.2 (8/7/2020)
  - Source code available for purchase
  - Compiled executables available free of charge
# Planning for IBIS Version 7.1

BIRDs approved for 7.1

<table>
<thead>
<tr>
<th>BIRD ID</th>
<th>BIRD Title</th>
<th>Approval Date</th>
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<tbody>
<tr>
<td>195.1</td>
<td>Enabling [Rgnd] and [Rpower] Keywords for Input Models</td>
<td>August 31, 2018</td>
</tr>
<tr>
<td>197.7</td>
<td>New AMI Reserved Parameter DC_Offset</td>
<td>February 21, 2020</td>
</tr>
<tr>
<td>198.3</td>
<td>Keyword Additions for On-Die PDN (Power Distribution Network) Modeling</td>
<td>August 7, 2020</td>
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<tr>
<td>199</td>
<td>Fix Rx_Receiver_Sensitivity Inconsistencies</td>
<td>June 7, 2019</td>
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<tr>
<td>200</td>
<td>C_comp Model Using IBIS-ISS or Touchstone</td>
<td>September 27, 2019</td>
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<tr>
<td>201.1</td>
<td>Back-channel Statistical Optimization</td>
<td>July 17, 2020</td>
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<tr>
<td>203</td>
<td>Submodel Clarification</td>
<td>April 24, 2020</td>
</tr>
<tr>
<td>204</td>
<td>DQ_DQS GetWave Flow for Clock Forwarding Modeling</td>
<td>June 26, 2020</td>
</tr>
<tr>
<td>205</td>
<td>New AMI Reserved Parameter for Sampling Position in AMI_Init Flow</td>
<td>June 26, 2020</td>
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BIRDs expected to be approved

<table>
<thead>
<tr>
<th>BIRD ID</th>
<th>BIRD Title</th>
<th>Tentative Vote Date</th>
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<tbody>
<tr>
<td>202</td>
<td>Electrical Descriptions of Modules</td>
<td>October 30, 2020</td>
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<tr>
<td>206</td>
<td>Clarification of text &quot;transition time&quot;</td>
<td>September 18, 2020</td>
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<tr>
<td>207</td>
<td>New AMI Reserved Parameters Component_Name and Signal_Name</td>
<td>October 9, 2020</td>
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</table>
What’s Next for IBIS?

• IBIS has traditionally focused on I/O buffers and interconnect, for:
  • Solving signal integrity issues from channel loss, inter-symbol interference (ISI), and crosstalk
  • Generating waveforms or eye diagrams for timing or bit-error-rate analysis

• IBIS must continue to evolve to meet both the SI and PI demands of new signaling technologies
  • Power Distribution Network (PDN) design is a critical piece of overall system design
  • Potential for IBIS to enable improved modeling/analysis of PDN
    • Voltage regulator models
    • Chip power models
Submitting Your Idea – BIRD Process

• BIRD – Buffer Issue Resolution Document
  • Official method for submitting a proposed change to the IBIS specification
• BIRD Template found on IBIS website
  • Standardizes method to describe your idea
• Submit BIRD to chair@ibis.org
• BIRDs discussed in Open Forum meetings
  • Eventual vote by members for approval
• Idea not ready for an official BIRD?
  • Join an IBIS Task Group meeting for technical discussion
BIRD Link on IBIS Website

Welcome to the IBIS Open Forum

Our Members

Link to BIRDS webpage
## Buffer Issue Resolution Documents (BIRD)

To submit a BIRD to the IBIS Open Forum, please use the [BIRD Template Rev. 1.3](#).

<table>
<thead>
<tr>
<th>ID#</th>
<th>Issue Title</th>
<th>Requester</th>
<th>Date Submitted</th>
<th>Date Accepted</th>
<th>Supporting Version</th>
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</thead>
<tbody>
<tr>
<td>207</td>
<td>New AMI Reserved Parameters Component_Name and Signal_Name</td>
<td>Randy Wolff, Micron Technology</td>
<td>July 29, 2020</td>
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<td>206</td>
<td>Clarification of text ‘transition time’</td>
<td>Hansel Desmond Dalva, Achronix Semiconductor; Walter Katz, Signal Integrity Software; Fangyi Rao, Keysight; Todd Benvenisolo, Keysight; Arpad Muranyi, Mentor Graphics.</td>
<td>June 26, 2020</td>
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<td>205</td>
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<td>Hansel Desmond Dalva, Achronix Semiconductor; Walter Katz, Signal Integrity Software; Todd Benvenisolo, Keysight; Fangyi Rao, Keysight; Arpad Muranyi, Mentor Graphics; Ambrish Varma, Cadence</td>
<td>May 14, 2020</td>
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<td>203</td>
<td>Submodel Clarification</td>
<td>Randy Wolff, Micron Technology</td>
<td>March 10, 2020</td>
<td>April 24, 2020</td>
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<td>202</td>
<td>Electrical Descriptions of Modules</td>
<td>Walter Katz, Signal Integrity Software</td>
<td>January 22, 2020</td>
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<td>200</td>
<td>C_comp Model Using IBIS-JSS or Touchstone</td>
<td>Randy Wolff, Micron Technology, Inc; Walter Katz, Signal Integrity Software, Inc.</td>
<td>July 9, 2019</td>
<td>September 27, 2019</td>
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[Thank You]

IBIS Open Forum:
Web: https://www.ibis.org
Email: ibis-info@freelists.org

We welcome participation by all IBIS model makers, EDA tool vendors, IBIS model users, and interested parties.