

# IBIS Open Forum Minutes

Meeting Date: **August 24, 2012**

Meeting Location: **Teleconference**

## VOTING MEMBERS AND 2012 PARTICIPANTS

Agilent	Heidi Barnes, Radek Biernacki*, Yoji Sekine, Fangyi Rao
Altera	David Banas*, Hsinho Wu, Masashi Shimanouchi
ANSYS (Ansoft)	Flavio Calvano, Luis Armenta, Dan Dvorscak
Applied Simulation Technology	Norio Matsui
ARM	(Nirav Patel)
Cadence Design Systems	Brad Griffin, Terry Jernberg, Jilin Tan, Dennis Nagle Ambrish Varma
Ericsson	Anders Ekholm, Zilwan Mahmod, Mattias Lundquist
Foxconn Technology Group	(Sogo Hsu)
Freescale	(Jon Burnett)
IBM	Adge Hawes*, Greg Edlund*
Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Michael Mirmak*, Subas Bastola, Udy Shrivastava, Stewart Gilbert, Eddie Frie
IO Methodology	Lance Wang
LSI	Brian Burdick*
Maxim Integrated Products	Hassan Rafat, Mahbubul Bari
Mentor Graphics	Arpad Muranyi*, Vladimir Dmitriev-Zdorov
Micron Technology	Randy Wolff, Aniello Viscardi, Francesco Madonna Antonio Prisco, Justin Butterfield
Nokia Siemens Networks GmbH	Eckhard Lenski*, Evis Minga
Signal Integrity Software	Walter Katz*, Mike LaBonte*, Todd Westerhoff Akalu Lentiro
Sigrity	Raymond Chen, Yingxin Sun, Sam Chitwood Ben Franklin, Srdjen Djordjevic
Synopsys	Andy Tai, Scott Wedge, Hany Elhak, Ted Mido
Teraspeed Consulting Group	Bob Ross*, Tom Dagostino
Texas Instruments	Casey Morrison, Pegah Alavi, Valerie Chang Modesto Garcia, Karl Muth
Toshiba	Masatoshi Abe
Xilinx	Harry Fu
Zuken	Michael Schaefer

## OTHER PARTICIPANTS IN 2012

AMD	(Nam Nguyen)
Apple Computer	(Matt Herndon)
Aruba Networks	Amir Motamedi
Avago Technologies	Sanjeev Gupta, Amolak Badesha

Bayside Design	Elliot Nahas
Cavium	Johann Nittmann
Ciena	Kaisheng (Klaus) Hu
Cisco Systems	David Siadat, Mike Sapozhnikov
Enterasys	Robert Haller
Exar Corporation	Helen Nguyen
Granite River Labs	Jiang Xu, Johnson Tan
Hewlett-Packard	Ting Zhu
High Speed Design Center	Ben Chia
Hitachi	Yutaka Uematsu
Huawei Technologies	Xiaoqing Dong
Instituto de Telecomunicações	Wael Dghais, Hugo Teixeira
JEITA	Atsushi Ishikawa
KEI Systems	Shinichi Maeda
Luxshare-ICT	Alan Kinningham, Steven Wong
MK Resolutions	Olga Chervyakova
Nvidia	Eric Hsu
Politecnico di Torino	Stefano Grivet-Talocia
QLogic	(James Zhou)
Research In Motion	Yi Cao
Sony	Kenji Yasoda
ST Microelectronics	Davide Pandini
TechAmerica	(Chris Denham)
Université de Brest	Mihai Telescu, Cherif Diouf
University of Illinois	Thomas Comberiate, José Schutt-Ainé
Vitesse Semiconductor	Sirius Tsang
ZTE	(Huang Min)

In the list above, attendees at the meeting are indicated by \*. Principal members or other active members who have not attended are in parentheses. Participants who no longer are in the organization are in square brackets.

## UPCOMING MEETINGS

The bridge numbers for future IBIS teleconferences are as follows:

Date	Meeting Number	Meeting Password
September 14, 2012	205 475 958	IBIS

For teleconference dial-in information, use the password at the following website:

<https://ciscosales.webex.com/ciscosales/j.php?J=205475958>

All teleconference meetings are 8:00 AM to 9:55 AM US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting. When calling into the meeting, follow the

prompts to enter the meeting ID. For new, local international dial-in numbers, please reference the bridge numbers provided by Cisco Systems at the following link:

[http://www.cisco.com/web/about/doing\\_business/conferencing/index.html](http://www.cisco.com/web/about/doing_business/conferencing/index.html)

NOTE: "AR" = Action Required.

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## **INTRODUCTIONS AND MEETING QUORUM**

No new participants.

## **CALL FOR PATENTS**

Michael Mirmak called for any patents or pending patents related to the IBIS 3.2, IBIS 4.2, IBIS 5.0, Touchstone 2.0 or ICM 1.1 specifications. No patents were declared.

## **REVIEW OF MINUTES AND ARS**

Mike LaBonte called for comments regarding the minutes of the August 3, 2012 IBIS Open Forum teleconference. The minutes were approved without changes.

## **MEMBERSHIP STATUS AND TREASURER'S REPORT**

Bob Ross reported that we have 26 officially paid members, but we should have one or two more membership confirmations from TechAmerica next week. Michael Mirmak speculated about what our membership break-even point might be. Bob indicated that due to re-organizations we no longer have a monthly charge rate to TechAmerica. With parser sales, (each sale of \$2,500 offsetting almost three memberships) we should be close to breaking even. Bob said that parser sales should be targeted to parser development contracts. He will work with Michael off-line to update the parser invoicing and payment status for 2012.

## **WEB PAGE UPDATES**

Mike LaBonte reported that the roster and poster pages have been updated to drop AMD, Apple, and Cisco as members. ARM has been added. An updated logo image was received from Zuken.

## **MAILING LIST ADMINISTRATION**

Mike LaBonte reported that recent email list problems are largely resolved and the lists are passing traffic. Emails from Walter Katz still fail to reach the list and Mike continues to work with eda.org support to fix this. Anyone who believes they are not receiving list email or is unable to send email to either list should contact Mike. Michael Mirmak expressed appreciation for the significant efforts to resolve this problem.

## **MODEL LIBRARY UPDATE**

Michael Mirmak reported that Anders Ekholm is not present and there is no update.

## **MISCELLANY/ANNOUNCEMENTS**

None.

## **CALL FOR NEW ISSUES**

None.

## **INTERNATIONAL/EXTERNAL ACTIVITIES**

### **- IEEE DASC**

Michael Mirmak reported that there will be a meeting September 2. The previous meeting was canceled. No IBIS-related issues are on the agenda for the next meeting.

### **- VHDL-AMS Table-Driven Models**

Arpad Muranyi reported that they are implementing code for table driven models now. Hopefully progress is being made. Michael Mirmak asked if there is a web URL for the minutes. Arpad said the URL already in the minutes is still the best one.

More information can be found at:

[http://www.eda.org/twiki/bin/view.cgi/P10761/ProjectsArea#Table\\_driven\\_Modeling\\_Champion\\_J](http://www.eda.org/twiki/bin/view.cgi/P10761/ProjectsArea#Table_driven_Modeling_Champion_J)

### **- Conferences**

- Michael Mirmak reported that EPEPS (21<sup>st</sup> IEEE Conference on Electrical Performance of Electronic Packaging and Systems) will be held October 21-24, 2012 in Tempe, Arizona. This event occasionally includes IBIS-related content. More information can be found at:

<http://epeps.ece.illinois.edu/>

Official IBIS participation may/may not be planned for all of the events above, though individual papers and discussion on IBIS are encouraged. These are events with refereed submissions, with deadlines either pending or already passed.

### **- Press Update**

None.

## **IEC APPROVAL ACTIVITIES**

Michael Mirmak said a replacement organization for TC93 would be identified sometime in September. We need to establish which group is responsible for IBIS, for us to pursue ANSI standardization issues.

## **SUMMIT STATUS**

Michael Mirmak thanked Bob Ross for his efforts to organize. Bob will be sending additional sponsor information to Mike LaBonte for the web page. Presentations must be ready October 5 and 9 for the Shanghai and Hsinchu conferences, respectively. Michael said having presentations earlier or at least knowing titles in advance helps us to plan. Bob said we expect over 100 people at each event.

### **-Asian IBIS Summit – Shanghai, November 9**

Bob indicated that the second announcement would go out after the meeting. Bob also stated that the co-sponsors are Huawei Technologies (primary), Agilent Technologies, ANSYS, Cadence Design Systems, Intel Corporation, IO Methodology, Synopsys, and ZTE Corporation.

### **-Asian IBIS Summit – Hsinchu, November 13**

Bob reported that the co-sponsors so far for this summit are ANSYS (primary), Agilent Technologies, Cadence Design Systems, Intel Corporation, and IO Methodology.

### **-Asian IBIS Summit – Yokohama, November 16**

Bob reported that an announcement for the Yokohama conference will be prepared soon.

Michael noted that sponsorship opportunities for all upcoming IBIS summits are available, with sponsors receiving free mentions in the minutes, agenda, and other announcements. This includes upcoming events in Asia. Michael suggested that this is a great opportunity to contact IBIS members. Contact the IBIS Board for further details.

## **QUALITY TASK GROUP**

Mike LaBonte reported the group has looked at the correlation figure of merit formula from the IBIS Accuracy handbook. Certain waveform deviations are able to give FOM percentages that are unintuitively high or low. The group intends to pursue improvements to the FOM. Work on an AMI quality checklist will also resume, now that IBIS 5.1 is no longer in flux and now that we have a pretty good handle on what the related parser changes are. Michael Mirmak asked if Feature Selective Validation (FSV) was still under consideration. Mike said that IEEE style frequency domain FSV has been taken off the table, but time domain FSV as proposed by David Banas and Roy Leventhal continues to be discussed.

The Quality Task Group checklist and other documentation can be found at:

[http://www.eda.org/ibis/quality\\_wip/](http://www.eda.org/ibis/quality_wip/)

## **ADVANCED TECHNOLOGY MODELING TASK GROUP**

Arpad Muranyi reported that Walter Katz has given a series of presentations regarding package and related modeling. They are entertaining new ideas but will have to make some decision soon. BIRDS will be needed.

Task group material can be found at:

[http://www.eda.org/ibis/macromodel\\_wip/](http://www.eda.org/ibis/macromodel_wip/)

## **EDITORIAL TASK GROUP**

Michael Mirmak reported that IBIS 5.1 is ready for voting today. We need to finalize the new BIRD template.

The task group documents can be reviewed at:

[http://www.eda.org/ibis/editorial\\_wip/](http://www.eda.org/ibis/editorial_wip/)

## **NEW ADMINISTRATIVE ISSUES**

None.

## **IBIS 5.1 SPECIFICATION**

Michael Mirmak noted that at the request of Bob Ross this agenda item has been moved to the front of the technical session. Bob Ross noted that some offline comments have been received. Michael said we will go over those. Changes have been posted to the website. Some changes are not yet listed but will be shown today. Michael showed a list of changes from draft 1 to draft 2 as well as a side-by-side difference window showing draft 3 changes, based on comments from Walter Katz and Bob.

Michael read the changes from draft 1 to draft 2. The hierarchy diagram has frequently been corrupted by editing tools, possibly due to the use of ellipses. This has been addressed by removing the ellipses. AMI\_Version will be treated as a string type, even though it appears as a number. Some examples were fixed to comply with rules.

Michael described the side-by-side draft 2 to draft 3 changes. The hierarchy diagram no longer has ellipses, which were not really needed. Radek Biernacki asked if the underlining of top level keywords in the diagram is really necessary. Michael said these could be removed, but there was concern about the effects on formatting and no decision was taken at the moment. For AMI\_Version, values like 5.1.0 will not be legal even though it is a string. The Model\_Specific example has been moved to a better location. Several improvements were made to the Tap example.

Michael issued the final call for comments on the IBIS 5.1 specification.

Arpad Muranyi moved to vote on approval of the draft 3 specification with changes as discussed. Bob seconded the motion. Radek Biernacki asked if we can vote at this time considering recent changes. Michael said that Arpad's formulation of the motion correctly incorporates recent comments. There was no formal objection. The vote passed with the following vote tally:

Agilent Technologies	yes
Altera	yes
IBM	yes
Intel Corp.	yes

LSI	yes
Mentor Graphics	yes
Micron Technology	yes (by email to Michael Mirmak)
Nokia Siemens Networks	yes
Signal Integrity Software	yes
Teraspeed Consulting	yes

Bob noted that there has been a 4 year span from IBIS 5.0, approved Aug 29, 2008. The IBIS 5.1 specification document and the comments list can be viewed at:

[http://www.eda.org/ibis/ver5.1\\_wip/](http://www.eda.org/ibis/ver5.1_wip/)

Bob made a motion to move up the bug and parser agenda items. Mike LaBonte seconded. There were no objections.

### **IBISCHK5 PARSER STATUS AND BUG STATUS**

Bob Ross reported that the parser development work has been comprehensive, and it has been adhering well to IBIS 5.1 already. BUG131 will be closed even though the bug is not completely correct in formulation. The developer has been asked to consider addressing BUG133, but this is not certain. The parser will be changed to enforce a rule against repeated items at the same level. This should yield a 5.1 compliant parser. The work will take about a month or less. Bob said it does not yet check for multiple AMI Description items at the same branch level, and asked if that should be a WARNING or ERROR. Walter Katz said that should be an ERROR. Radek Biernacki agreed. Bob is not sure we can have BUGs 132 and 133 addressed at this time.

### **IBIS SPECIFICATION CHANGE STATUS**

Michael Mirmak showed the BIRD list and said the right column would be updated to show which ones are incorporated into 5.1. An updated change list would be ready for the next teleconference.

Michael asked if any untabled BIRDS have been changed. Arpad Muranyi said they had not. These BIRDS were on hold until 5.1 was approved. Arpad said that the plan was to convert the BIRDS to the new format as necessary after v5.1 was ratified, but given recent presentations by Walter Katz they were not yet ready to begin that.

### **BIRD116.1: ADD IBIS-ISS TO [EXTERNAL MODEL] AND [EXTERNAL CIRCUIT] AS A SUPPORTED LANGUAGE**

No discussion.

### **BIRD117.4: PARAMETERIZE A\_TO\_D AND D\_TO\_A CONVERTERS**

No update.

**BIRD118.3: ANALOG PARAMETER ASSIGNMENTS**

No update.

**BIRD129: ADD “POLARITY” ARGUMENT TO D\_TO\_A CONVERTERS**

No update.

**BIRD153: PARAMETER TREE KEYWORD**

No update.

**BIRD121.1: IBIS-AMI NEW RESERVED PARAMETERS FOR DATA MANAGEMENT**

Discussion was tabled.

**BIRD122: IBIS-AMI NEW RESERVED PARAMETERS FOR ANALOG MODELING**

Discussion was tabled.

**BIRD123.3: IBIS-AMI NEW RESERVED PARAMETERS FOR JITTER/NOISE**

No update.

**BIRD125.1: MAKE IBIS-ISS AVAILABLE FOR IBIS PACKAGE MODELING**

Discussion was tabled.

**BIRD128: ALLOW AMI\_PARAMETERS\_OUT TO PASS AMI\_PARAMETERS\_IN DATA ON CALLS TO AMI\_GETWAVE**

Discussion was tabled.

**BIRD 131: IBIS-AMI REPEATERS**

Discussion was tabled.

**BIRD144.3: ADD TOUCHSTONE TO [EXTERNAL MODEL] AND [EXTERNAL CIRCUIT] AS A SUPPORTED LANGUAGE**

Discussion was tabled.

**BIRD145.2: CASCADING IBIS I/O BUFFERS WITH [EXTERNAL CIRCUIT]S USING THE [MODEL CALL] KEYWORD**

Discussion was tabled.



## **BIRD147: BACK-CHANNEL SUPPORT**

Discussion was tabled.

## **BIRD150: IBIS-AMI NEW RESERVED PARAMETERS FOR DEPENDENCY TABLES**

Discussion was tabled.

## **NEW TECHNICAL ISSUES**

Walter Katz showed a presentation “New Approach for Implementing IBIS-ISS for Package, Module, Connector, Cable, and External Model”. He will send this to Mike LaBonte for posting to the IBIS website. The presentation gives an overview of historical interconnect model formats and presents a proposal to address all needs using one basic format.

On slide 8 Radek Biernacki asked if power and ground would be covered. Walter said the example shows those nets but more data might be needed to show the full syntax. On slide 12 Walter noted that the example EBD shown has Gd and Rs values in comments, which EBD does not support. Slide 15 shows that loss data are important for accuracy at higher frequencies. On slide 19 Walter noted that connector vendors tend to deliver multi-wafer slice models more often than full models. On slide 20 Walter said Arpad Muranyi’s proposal regarding macros might be considered. On slide 21 Greg Edlund noted that the parameters seem to be about a buffer circuit, but it looks like the package model. Walter said that the syntax for interconnect and buffer models were similar but are contextually different. Walter described the additional stimulus parameters and said they replace the IBIS D\_to\_A converter syntax. He clarified that many of these needs have common elements. On slide 23 Walter proposed that we should:

- Reject BIRDS 116, 117, 118, 122, 125, 129, 144, 145, 152 and 153.
- Generate BIRDS to implement the described syntax using IBIS-ISS.
- Generate BIRDS to implement the described syntax using IBIS-BSS for buffers.
- Create an EMD section in IBIS 6.0.
- Consider splitting certain sections into separate documents for IBIS 6.0.

Walter clarified that this was not currently a formal motion, and it would be discussed in ATM meetings. Arpad noted that given the large scale changes proposed in Walter’s presentation we might want to address a few other fundamentally incorrect things in IBIS, such as its pin centric nature. Associating buffer calls directly with pins does not make sense now that package and on-die interconnect models are more complicated. Buffers should be associated with a point/node on the die. Walter said it might be easier to put this in a separate EMD file. Arpad disagreed and suggested that the future direction of IBIS should be discussed in the Open Forum at large before the details of BIRDS are discussed in the ATM group.

## **NEXT MEETING**

The next IBIS Open Forum teleconference will be held September 14, 2012 from 8:00 to 10:00 AM US Pacific Time, and then on October 5, 2012.

David Banas moved to adjourn. Radek Biernacki seconded. There were no objections.

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## NOTES

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This meeting was conducted in accordance with the TechAmerica Legal Guides and TechAmerica Manual of Organization and Procedure.

The following e-mail addresses are used:

[majordomo@eda.org](mailto:majordomo@eda.org)

In the body, for the IBIS Open Forum Reflector:  
subscribe ibis <your e-mail address>

In the body, for the IBIS Users' Group Reflector:  
subscribe ibis-users <your e-mail address>

Help and other commands:  
help

[ibis-request@eda.org](mailto:ibis-request@eda.org)

To join, change, or drop from either or both:  
IBIS Open Forum Reflector ([ibis@eda.org](mailto:ibis@eda.org))  
IBIS Users' Group Reflector ([ibis-users@eda.org](mailto:ibis-users@eda.org))  
State your request.

[ibis-info@eda.org](mailto:ibis-info@eda.org)

To obtain general information about IBIS, to ask specific questions for individual response, and to inquire about joining the IBIS Open Forum as a full Member.

[ibis@eda.org](mailto:ibis@eda.org)

To send a message to the general IBIS Open Forum Reflector. This is used mostly for IBIS Standardization business and future IBIS technical enhancements. Job posting information is not permitted.

[ibis-users@eda.org](mailto:ibis-users@eda.org)

To send a message to the IBIS Users' Group Reflector. This is used mostly for IBIS clarification, current modeling issues, and general user concerns. Job posting information is not permitted.

[ibis-bug@eda.org](mailto:ibis-bug@eda.org)

To report ibischk parser BUGs as well as tschk2 parser BUGs. The BUG Report Form for ibischk resides along with reported BUGs at:

<http://www.eda.org/ibis/bugs/ibischk/>  
<http://www.eda.org/ibis/bugs/ibischk/bugform.txt>

The BUG Report Form for tschk2 resides along with reported BUGs at:

[http://www.eda.org/ibis/tschk\\_bugs/](http://www.eda.org/ibis/tschk_bugs/)  
[http://www.eda.org/ibis/tschk\\_bugs/bugform.txt](http://www.eda.org/ibis/tschk_bugs/bugform.txt)

[icm-bug@eda.org](mailto:icm-bug@eda.org)

To report icmchk1 parser BUGs. The BUG Report Form resides along with reported BUGs at:

[http://www.eda.org/ibis/icm\\_bugs/](http://www.eda.org/ibis/icm_bugs/)  
[http://www.eda.org/ibis/icm\\_bugs/icm\\_bugform.txt](http://www.eda.org/ibis/icm_bugs/icm_bugform.txt)

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

<http://www.eda.org/ibis/bugs/s2ibis/bugs2i.txt>  
<http://www.eda.org/ibis/bugs/s2ibis2/bugs2i2.txt>  
<http://www.eda.org/ibis/bugs/s2iplt/bugsplt.txt>

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

<http://www.eda.org/ibis>

Check the IBIS file directory on eda.org for more information on previous discussions and results:

<http://www.eda.org/ibis/directory.html>

To create an account on the TechAmerica KAVI workspace, check out:

<http://workspace.techamerica.org/kwspub/join/>

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## IBIS – TECHAMERICA STANDARDS BALLOT VOTING STATUS

### I/O Buffer Information Specification Committee (IBIS)

Organization	Interest Category	Standards Ballot Voting Status	June 22, 2012	July 13, 2012	August 3, 2012	August 24, 2012
Agilent Technologies	User	Active	-	X	X	X
Altera	Producer	Active	X	-	X	X
ANSYS	User	Active	X	X	X	-
Applied Simulation Technology	User	Inactive	-	-	-	-
ARM	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	X	X	X	-
Ericsson	Producer	Inactive	-	-	-	-
Foxconn Technology Group	Producer	Inactive	-	-	-	-
Freescale	Producer	Inactive	-	-	-	-
IBM	Producer	Inactive	-	-	-	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Active	X	X	X	-
LSI	Producer	Active	-	-	X	X
Maxim Integrated Products	Producer	Inactive	-	-	-	-
Mentor Graphics	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	-
Nokia Siemens Networks	Producer	Active	X	X	-	X
Signal Integrity Software	User	Active	X	X	X	X
Sigrity	User	Inactive	-	-	-	-
Synopsys	User	Inactive	-	-	-	-
Teraspeed Consulting	General Interest	Active	-	X	X	X
Texas Instruments	Producer	Inactive	-	-	-	-
Toshiba	Producer	Inactive	-	-	-	-
Xilinx	Producer	Inactive	-	-	-	-
Zuken	User	Inactive	-	-	-	-

#### CRITERIA FOR MEMBER IN GOOD STANDING:

- MUST ATTEND TWO CONSECUTIVE MEETINGS TO ESTABLISH VOTING MEMBERSHIP
- MEMBERSHIP DUES CURRENT
- MUST NOT MISS TWO CONSECUTIVE MEETINGS

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- PRODUCERS - MEMBERS THAT SUPPLY ELECTRONIC EQUIPMENT.
- GENERAL INTEREST - MEMBERS ARE NEITHER PRODUCERS NOR USERS. THIS CATEGORY INCLUDES, BUT IS NOT LIMITED TO, GOVERNMENT, REGULATORY AGENCIES (STATE AND FEDERAL), RESEARCHERS, OTHER ORGANIZATIONS AND ASSOCIATIONS, AND/OR CONSUMERS.