IBIS Open Forum Minutes

Meeting Date: February 27, 2015
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2015 PARTICIPANTS

Altera	[David Banas], Masashi Shimanouchi*, Hsinho Wu*
ANSYS	(Steve Pytel)
Applied Simulation Technology	Fred Balistreri, Norio Matsui
Avago Technologies	Minh Quach, Leif Zweidinger
Cadence Design Systems	Brad Brim*, Joshua Luo, Ken Willis, Joy Li
Cisco Systems	David Siadat, Rockwell Hsu, Bidyut Sen*
Ericsson	Anders Ekholm
Huawei Technologies	Xiaoqing Dong
IBM	Adge Hawes*, Luis Armenta
Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Michael Mirmak*, Todd Bermensolo, Nhan Phan
IO Methodology	Lance Wang*
Keysight Technologies	Radek Biernacki*, Pegah Alavi, Colin Warwick Jian Yang, Nicholas Tzou, Heidi Barnes, Dave Larson Kyla Thomas
Maxim Integrated Products	Mahbubul Bari, Don Greer*, Joe Engert
Mentor Graphics	Arpad Muranyi*, Ed Bartlett, Vladimir Dmitriev-Zdorov
Micron Technology	Randy Wolff*
Qualcomm	Senthil Nagarathinam, Kevin Roselle
Signal Integrity Software	Mike LaBonte*, Walter Katz*, Todd Westerhoff Mike Steinberger
Synopsys	Ted Mido, Rita Horner, William Lau, Scott Wedge Michael Zieglmeier
Teraspeed Labs	Bob Ross*, Tom Dagostino
Toshiba	(Yasumasa Kondo)
Xilinx	(Raymond Anderson)
ZTE Corporation	(Min Huang)
Zuken	Michael Schaeder, Markus Buecker, Griff Derryberry

OTHER PARTICIPANTS IN 2015

Bayside Design	Elliot Nahas
Continental Automotive	Felix Goelden, Markus Bebendorf
CST	Stefan Paret
Freescale	Jon Burnett
Galbi Research	Dave Galbi
Independent	Tim Wang Lee
KEI Systems	Shinichi Maeda
Lattice Semiconductor	Xu Jiang

Raytheon	Joseph Aday
SAE International	Chris Denham
Simberian	Yuriy Shlepnev
Vitesse	Siris Tsang
ZI Consulting	Iliya Zamek

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 |
| March 20, 2015 | 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 a.m. to 9:55 a.m. 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

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM
Michael Mirmak declared that a quorum was reached and the meeting could begin.

Masashi Shimanouchi from Altera introduced himself. He is working on IBIS-AMI modeling.

Hsinho Wu from Altera introduced himself. He is working on IBIS-AMI model generation.

Bidyut Sen from Cisco introduced himself. He is in the server division and is involved in IBIS modeling for high speed links.

Don Greer from Maxim introduced himself. He manages hardware engineering groups. They work on products such as automatic test equipment and reference boards. They are users of IBIS models and are interested in improving model quality to improve correlation to

measurements.

CALL FOR PATENTS
Michael Mirmak called for any patents or pending patents related to the IBIS 3.2, IBIS 4.2, IBIS 5.1, IBIS 6.0, Touchstone 2.0, IBIS-ISS 1.0 or ICM 1.1 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS
Randy Wolff called for comments regarding the minutes of the January 30, 2015 DesignCon IBIS Summit. Radek Biernacki commented that there was one more contribution to the discussion at the end of the meeting after Randy had left. In brief he said "Let's go back to the issue of Scenario #3. It is not really about the legacy models, but rather about facilitating transmitter optimization, for example in cases that the transmitter is optimizable, but the receiver model does not have the proposed functionalities." The minutes were approved with the noted changes. He then called for comments regarding the February 6, 2015 IBIS Open Forum teleconference. The minutes were approved without changes.

Randy reviewed previous meeting ARs. He noted that Bob Ross had an AR to ask the parser developer about a cost estimate for a parser upgrade. Also, Arpad Muranyi had an AR to send an email to the reflector to solicit comments on a new specification release. Michael Mirmak noted that these ARs are closed out.

ANNOUNCEMENTS
None.

CALL FOR ADDITIONAL AGENDA ITEMS
None.

MEMBERSHIP STATUS AND TREASURER'S REPORT
Bob Ross reported that Cisco is a new voting member. Avago Technologies has been restored as a member. We now have 24 voting members. The treasury increased to $51,339 as a result of membership dues payments and a parser payment from ANSYS for ibischk6. One additional parser payment is pending. All the DesignCon expenses have been taken into account.

WEB PAGE AND MAILING LIST ADMINISTRATION
Mike LaBonte reported that the home page now lists three new items in italics at the top. These include the IBISCHK6 parser, summit presentations and the Policies and Procedures draft. Member logos are updated on the home page and poster page, and on the roster listing some contact information has changed. The summits page was also updated. Email lists are going fine.

Mike mentioned there is a possibility of moving the email list from eda.org to freelists. Would we

batch move everyone over or ask everyone to subscribe to a new list? Mike thought he should put out some details to the mailing list. With eda.org, some anti-spam measures prevent some emails from getting to all list members. Freelists has found a way around this. Mike took an AR to send out details to the email list.

LIBRARY UPDATE
No update.

INTERNATIONAL/EXTERNAL ACTIVITIES
- Conferences
The 19th IEEE Workshop on Signal and Power Integrity (SPI 2015) will be held in Berlin, Germany, from May 10-13, 2015. An IBIS Summit meeting will be held in conjunction with this Workshop. The paper submission deadline is January 31, 2015. More information is available at:

> http://www.spi2015.org/

- Press Update
None.

ORGANIZATIONAL ACTIVITIES
- Policies and Procedures Call for Comment
Michael Mirmak noted that we are looking to update our charter, first established in 1995 and last updated a few years after that. In an effort to bring us up to date, there is a draft Policies and Procedures document available for review at:

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

We will keep the document open for comment at the next Open Forum meeting. After addressing any comments, we will solicit a vote. The vote requires a large quorum, with approval needing 16 member companies, a 2/3 majority. Bob Ross commented that we will need to include email voting to reach this quorum.

SUMMIT PLANNING AND STATUS
- EPEPS Summit Planning
EPEPS is taking place October 25-28, 2015 in San Jose, CA. Bob Ross noted that October 28 would be the date for the Summit if it takes place. Brad Brim asked if the meeting would take place in the afternoon after the sessions are over. He noted that EPEPS tends to be a one-track event, so we wouldn't want to compete with any presentations. Bob responded that the meeting would occur after the conference ends. Bob noted that this is close to the Asian IBIS Summits, so it may require more planning than we want to deal with. Michael Mirmak asked if anyone would attend EPEPS. Several people commented that they would attend. Bob commented that a Summit at EPEPS would attract attendees who would not go to the Asian IBIS Summits. Brad commented that there would probably be duplication of presentations. Bob

responded that this is actually encouraged.

- SPI Summit Planning

Bob reported that there is interest in having a meeting co-located with the SPI conference in Berlin, Germany on May 13, 2015. Michael Schaeder has sent out an email gauging interest in the event from likely attendees. Bob noted that Zuken has traditionally been a sponsor, but we are open to more sponsorship.

Randy Wolff commented that we are looking to have a meeting co-located with the SPI conference in Berlin, Germany on May 13, 2015. He noted that we received an email from Michael Schaeder about the potential Summit meeting. Michael stated that CST and Mentor committed to be co-sponsors. CST, Mentor, Synopsys, ANSYS and Cadence will make their users aware of the Summit. He also got positive feedback from Siemens and Infineon. Michael and Ralf Bruening already discussed the Summit with the SPI organizer Ivan Ndip. Ivan already arranged the room for the Summit and announced the Summit on the SPI webpage. Michael also stated that SPI is looking to attract more industry participants, so this should make an IBIS Summit more attractive to more attendees in the future.

Michael Mirmak confirmed that we will host a meeting since we already have a room and sponsorship. We will start making announcements and send out a call for papers.

Sponsorship opportunities for all upcoming IBIS summits are available, with sponsors receiving free mentions in the minutes, agenda, and other announcements. Contact the IBIS Board for further details.

QUALITY TASK GROUP

Mike LaBonte reported that the group is meeting on Tuesdays at 8:00 a.m. PT. They are continuing to work on the ibischk6 user guide. It is a large project, so there is a lot more work to do. There has also been discussion of golden waveforms recently. These have barely been used on any models. There was a discussion from Anders Ekholm years ago about revamping them to make more test loads available. This will be a continuing discussion topic. They are also looking at a potential bug for ibischk6 relating to reserved words for AMI models. If you use reserved words for parameter names, ibischk6 does not flag an issue.

Michael Mirmak reminded Mike of a previous discussion that there is no way to specify the test pattern used for creating test data for golden waveforms. Mike noted that this is an item to discuss amongst many others for enabling golden waveforms. If we can streamline the process for adding golden waveforms to models, there is a lot of data available and he thinks model makers would add more to the models.

The ibischk6 user guide work in progress can be reviewed at:

> http://www.eda.org/ibis/ibischk6/ibischk_6.0.0_UserGuide_wip1.pdf

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

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

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that the group is meeting regularly on Tuesdays at 12:00 p.m. PT. They are discussing C_comp improvements, AMI directionality, and they are resuming discussion on BIRD147.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak reported that the group's current work is reviewing the current revision of BIRD text for the package and on-die interconnect BIRD. There are several syntax changes needed. They are at draft 17 including updated examples from Walter Katz. The group is meeting on Wednesdays at 8:00 a.m. PT.

Task group material can be found at:

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

NEXT VERSION OF IBIS

Michael Mirmak discussed options of releasing a new version of IBIS including all currently approved BIRDs versus waiting for backchannel modeling and package and on-die interconnect BIRDs to get approved. Arpad Muranyi reported that he did send an email to the reflector to ask for comments about this topic. There has not been a release of the specification for about two years. We have discussed wanting to make regular releases of the specification. He thought there were some important BIRDs such as BIRD155.2 that would be good to get into an official specification release. Arpad mentioned that we might also want to change the numbering of the specifications. This would depend on the cost of parser development. Bob Ross reported that he did send an email to the parser developer to enquire about development cost, but he has not received a response yet. Bob noted that five of the BIRDs currently approved would require parser changes. Arpad noted that his company does prefer to make incremental changes to the software, so, smaller, more regular releases of the IBIS specification are preferred. Radek Biernacki commented that incremental changes are more efficient.

Arpad moved to form an editorial committee to draft a new specification including the approved BIRDs after this meeting. Brad Brim asked if forming a committee meant a vote for the specification release, or if those were separate approvals. He needs to consult with colleagues before supporting a new specification release. Michael commented that the final document would require another vote. Arpad asked if the specification vote required special circumstances. Michael clarified that the vote follows regular procedures, not SAE approval requirements. Walter Katz clarified that this vote will only establish an editorial committee to prepare a document which will then be voted on later. Bob seconded the motion. There were no objections.

Bob, Radek, Arpad and Randy Wolff expressed interest in being a part of the editorial committee. Michael noted that anyone with interest could contact him to be added. Arpad took an AR to send out an email to test the editorial mailing list and solicit volunteers. Arpad will send out an email once a meeting time is established.

NEW ADMINISTRATIVE ISSUES
None.

BIRD174.1: QUOTE CHARACTER CLARIFICATIONS
Arpad Muranyi reported that a minor change to the BIRD was made before the last meeting to remove some questions left in the BIRD text but not intended to be included in the specification. A comment from Ted Mido was also addressed with some further testing to ensure no issues. There have been no further comments since the last Open Forum meeting. This BIRD clarifies quote characters that can be used in the specification. Radek Biernacki commented that a thorough review of the specification will be needed to make sure there are no incorrect quote characters included in the current IBIS specification.

Arpad moved to vote on inclusion of the BIRD in the next version of IBIS. Radek seconded the motion. The vote passed with the following vote tally:

Altera – yes
Cadence – yes
Cisco – yes
IBM – yes
Intel – yes
IO Methodology – yes
Keysight – yes
Maxim – yes
Mentor – yes
Micron – yes
SiSoft – yes
Teraspeed Labs – yes

BIRD125.1: MAKE IBIS-ISS AVAILABLE FOR IBIS PACKAGE MODELING
Discussion was tabled.

BIRD128.2: ALLOW AMI_PARAMETERS_OUT TO PASS AMI_PARAMETERS_IN DATA ON CALLS TO AMI_GETWAVE
Discussion was tabled.

BIRD145.3: CASCADING IBIS I/O BUFFERS WITH [EXTERNAL CIRCUIT]S USING THE [MODEL CALL] KEYWORD

Discussion was tabled.

BIRD147: BACK-CHANNEL SUPPORT
Discussion was tabled.

BIRD157: PARAMETERIZE [DRIVER SCHEDULE]
Discussion was tabled.

BIRD158.3: AMI TOUCHSTONE ANALOG BUFFER MODELS
Discussion was tabled.

BIRD161.1: SUPPORTING INCOMPLETE AND BUFFER-ONLY [COMPONENT] DESCRIPTIONS
Discussion was tabled.

BIRD163: INSTANTIATING AND CONNECTING [EXTERNAL CIRCUIT] PACKAGE MODELS WITH [CIRCUIT CALL]
Discussion was tabled.

BIRD164: ALLOWING PACKAGE MODELS TO BE DEFINED IN [EXTERNAL CIRCUIT]
Discussion was tabled.

BIRD165: PARAMETER PASSING IMPROVEMENTS FOR [EXTERNAL CIRCUIT]S
Discussion was tabled.

BIRD166: RESOLVING PROBLEMS WITH REDRIVER INIT FLOW
Discussion was tabled.

IBISCHK6 PARSER AND BUG STATUS
Bob Ross reported that there are no new BUGs. He and Mike LaBonte may report a new bug soon. Bob has asked the parser developer for a cost estimate for parser development to cover five BIRDs and two open bugs.

NEW TECHNICAL ISSUES
Michael Mirmak discussed the possibility of updating the Touchstone specification. There are three approved TSIRDs. There is additional interest in discussing the binary format support

further. It is likely that the Interconnect task group will discuss Touchstone updates after they finish their current work on package and on-die interconnect modeling. Walter Katz noted he would like to re-open the issue to reorder the data sequence in the binary file. This could allow for significant performance improvements.

Discussion was cut off due to WebEx issues, and the meeting was forced to end early.

NEXT MEETING
The next IBIS Open Forum teleconference meeting will be held March 20, 2015. The following IBIS Open Forum teleconference meeting will be held April 10, 2015.

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NOTES

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This meeting was conducted in accordance with ANSI guidance.

The following e-mail addresses are used:

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

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
>   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
>   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
>   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/bugform.txt

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/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

Other trademarks, brands and names are the property of their respective owners.

IBIS – SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	January 9, 2015	January 30, 2015	February 6, 2015	February 27, 2015
Altera	Producer	Active	X	X	-	X
ANSYS	User	Inactive	-	-	-	-
Applied Simulation Technology	User	Inactive	-	X	-	-
Avago Technologies	Producer	Inactive	-	X	-	-
Cadence Design Systems	User	Active	X	X	-	X
Cisco Systems	User	Inactive	-	X	-	X
Ericsson	Producer	Inactive	-	X	-	-
Huawei Technologies	Producer	Inactive	-	X	-	-
IBM	Producer	Active	-	X	X	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Active	X	X	X	X
Keysight Technologies	User	Active	X	X	X	X
Maxim Integrated Products	Producer	Inactive	-	X	-	X
Mentor Graphics	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
Qualcomm	Producer	Inactive	X	X	-	-
Signal Integrity Software	User	Active	X	X	X	X
Synopsys	User	Active	X	X	X	-
Teraspeed Labs	General Interest	Active	X	X	X	X
Toshiba	Producer	Inactive	-	-	-	-
Xilinx	Producer	Inactive	-	-	-	-
ZTE	User	Inactive	-	-	-	-
Zuken	User	Inactive	-	X	-	-

I/O Buffer Information Specification Committee (IBIS)

CRITERIA FOR MEMBER IN GOOD STANDING:

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

INTEREST CATEGORIES ASSOCIATED WITH SAE BALLOT VOTING ARE:

- USERS - MEMBERS THAT UTILIZE ELECTRONIC EQUIPMENT TO PROVIDE SERVICES TO AN END USER.
- 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.