



IBIS Open Forum Minutes

Meeting Date: **July 14, 2017**

Meeting Location: **Teleconference**

VOTING MEMBERS AND 2017 PARTICIPANTS

ANSYS	Curtis Clark*, Toru Watanabe
Applied Simulation Technology	(Fred Balistreri)
Broadcom	Bob Miller
Cadence Design Systems	Brad Brim*, Sivaram Chillarige, Debabrata Das Ambrish Varma
CST	Stefan Paret, Matthias Troescher, Burkhard Doliwa Danilo Di Febo, Alexander Melkozerov
Ericsson	Zilwan Mahmod
GLOBALFOUNDRIES	Steve Parker*
Huawei Technologies	(Jinjun Li)
IBM	Luis Armenta, Adge Hawes, Greg Edlund
Infineon Technologies AG	(Christian Sporrer)
IO Methodology	Lance Wang
Keysight Technologies	Radek Biernacki*, Pegah Alavi, Fangyi Rao Stephen Slater, Jian Yang
Maxim Integrated	Joe Engert, Don Greer, Yan Liang, Hock Seow
Mentor, A Siemens Business (formerly Mentor Graphics)	Arpad Muranyi*, Nitin Bhagwath, Praveen Anmula Fadi Deek, Raj Raghuram, Dmitry Smirnov Bruce Yuan, Carlo Bleu
Micron Technology	Randy Wolff, Justin Butterfield
NXP	(John Burnett)
Qualcomm	Tim Michalka, Kevin Roselle
Raytheon	Joseph Aday
Signal Integrity Software	Mike LaBonte*, Walter Katz*, Todd Westerhoff
Synopsys	Kevin Li, Ted Mido*, John Ellis, Scott Wedge
Teraspeed Labs	Bob Ross*
Xilinx	(Raymond Anderson)
Zuken	Ralf Bruening, Michael Schaefer, Alfonso Gambuzza

OTHER PARTICIPANTS IN 2017

Accton	Raul Lozano
ASUS	Nick Huang, Bin-chyi Tseng
Cisco Systems	(Bidyut Sen)
Continental AG	Stefanie Schatt
eASIC	David Banas

Extreme Networks	Bob Haller
Ghent University	Paolo Manfredi
Hamburg University of Technology	Torsten Revschel, Torsen Wendt
IdemWorks	Michelangelo Bandinu
Independent	Dian Yang
Intel Corporation	Michael Mirmak*, Hsinho Wu*, Eddie Frie Gianni Signorini, Barry Grquinovic
John Baprawski, Inc.	John Baprawski
KEI Systems	Shinichi Maeda
Lattice Semiconductor	Maryam Shahbazi, Dinh Tran
Leading Edge	Pietro Vergine
Politecnico di Torino	Claudio Siviero, Stefano Grivet-Talocia, Igor Stievano
SAE International	(Thomas Munns)
Signal Metrics	Ron Olisar
SPISim	Wei-hsing Huang
STMicroelectronics	Fabio Brina, Olivier Bayet
Toshiba	Yasuki Torigoshi
Université Blaise Pascal	Mohamed Toure
Université de Bretagne Occidentale	Mihai Telescu
ZTE Corporation	(Shunlin Zhu)

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
August 4, 2017	624 999 876	IBISfriday11

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

<http://tinyurl.com/zeulerr>

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.

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM

Curtis Clark declared that a quorum was reached and the meeting could begin. Curtis took the meeting minutes in the absence of Randy Wolff.

CALL FOR PATENTS

Mike LaBonte called for declaration of any patents or pending patents related to the IBIS 3.2, IBIS 4.2, IBIS 5.1, IBIS 6.1, Touchstone 2.0, IBIS-ISS 1.0 or ICM 1.1 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS

Mike LaBonte called for comments on the minutes of the June 23, 2017 IBIS Open Forum teleconference. Radek Biernacki moved to approve the minutes. Bob Ross seconded the motion. There were no objections.

Curtis Clark reviewed ARs from the previous meeting.

1. Mike LaBonte to add EDI CON discount code to the website [AR].
Mike reported that this was done. Mike reported that this had been added to the Upcoming Events page. The EDI CON banner image was too large to place directly on the home page, but he is going to add a new link item at the top of the home page [AR].
2. Mike LaBonte to produce a document comparing the latest Policies and Procedures to the previous version [AR].
Mike reported that this was done, but he had only sent it out just prior to the meeting.

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS

None.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that there were no changes since the last meeting. There are 23 paid members. There are currently 3 pending renewals for which we have yet to receive payments. We expect to make several payments in the near future including an invoice for the most recent parser development.

Our account balance is at \$18,794 for 2017. Actual cash flow of \$17,044 has been collected in 2017.

WEBSITE ADMINISTRATION

Mike LaBonte shared the Upcoming Events page and displayed the EDI CON banner. He noted that EDI CON provided us with a 60% discount pass with the IBIS code. Bob Ross noted that the Asian IBIS Summit dates were no longer TBD, and the actual values should be added to the page. Bob also noted that tentative dates for SPI Europe could also be added. Mike agreed to update the Upcoming Events page to add summit dates [AR]:

MAILING LIST ADMINISTRATION

Curtis Clark reported nothing had changed since the last meeting. Things are working properly.

LIBRARY UPDATE

No update.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

EDI CON – Electronic Design Innovation Conference & Exhibition will be held in Boston, MA on September 11-13, 2017. An IBIS Summit at this event is planned. More information is available at:

<http://www.ediconusa.com>

EPEPS – The 26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems will be held in San Jose, CA on October 15-18, 2017. An IBIS Summit at this event is planned. More information is available at:

<http://www.epeps.org/>

- Press Update

Mike LaBonte noted that David Banas had written a new EDN article about IBIS AMI:

<http://www.edn.com/design/pc-board/4458614/An-IBIS-AMI-Simulator-for-the-rest-of-us>

- Related standards

None.

SUMMIT PLANNING AND STATUS

- EDI CON

EDI CON will be held in Boston, MA on September 11-13, 2017. The IBIS Summit will be held from 1:00 p.m. to 5:00 p.m. on Wednesday, September 13, 2017 in Room 104 at the Hynes Convention Center. Mike LaBonte noted that we now know the Summit will be in Room 104 at the Hynes. He said planning and arrangements with EDI CON were going well. He noted that we had sent out one announcement about this Summit. Bob Ross said he had not seen the announcement go out. Mike agreed to check and send it out if it had not been sent [AR].

Bob asked if we had a ballpark figure on the expected cost. Mike said no, but he noted that the only expense for us would be the afternoon break refreshments. EDI CON (Microwave Journal) is picking up the cost of the room and providing free food just before the meeting. Mike said he had contacted Janine (Event Director) about ordering food. Bob noted that we typically work directly with whatever caterer she provides. Mike noted that AV equipment would be provided in the room already. Bob said that based on experience we should expect about \$500 for the food. Mike and Bob noted that we would appreciate any sponsors and presentations.

- EPEPS

EPEPS will be held in San Jose, CA on October 15-18, 2017. The IBIS Summit will be held on

Wednesday afternoon, October 18, 2017. Bob Ross noted that he had contacted the organizers of EPEPS regarding logistics, but had not heard back yet. Bob noted that he has thus far held off on seeking sponsorship and is waiting until he has a better idea of the cost. He expects to ask for around \$500 per sponsor. Mike LaBonte noted that the first announcement for this Summit will go out in about a month. Mike noted that we would be looking for sponsorship and presentations.

- Asian IBIS Summit (Shanghai)

An IBIS Summit will be held at the Parkyard Hotel Shanghai from 8:30 a.m. to 5:00 p.m. on Monday, November 13, 2017. Bob Ross noted that we expect several sponsors, and Cadence has already committed.

- Asian IBIS Summit (Taipei)

An IBIS Summit will be held at the Sherwood Hotel from 9:00 a.m. to 4:30 p.m. on Wednesday, November 15, 2017. Mike LaBonte noted that hotel arrangements were already made.

- Asian IBIS Summit (Tokyo)

An IBIS Summit will be held at the Akihabara UDX Bldg. from 12:30 p.m. to 5:00 p.m. on Friday, November 17, 2017. Bob Ross noted that this is a half-day summit at the same location as last year. JEITA is again handling it, and they will most likely offer an IBIS course in the morning. Mike LaBonte and Bob noted that Shogo Fujimori is no longer the JEITA contact for this. Mike will update the Upcoming Events page with new contact information [AR].

- SPI 2018 IBIS Summit

Bob Ross noted that we had just been invited to participate at SPI 2018. He noted that SPI has been shifted a week or two later to accommodate French holidays. It will be held in Brest, France. If we hold a summit there, it will be our 21st consecutive European IBIS Summit. Mike LaBonte noted that Zuken had stepped in to run the summit in 2017. Bob noted that Zuken said they would participate again in 2018. Bob noted that we are seeing increasing lead times for planning summits. For Asian Summits we often need to plan 6 to 10 months in advance to ensure we get accommodations. Now SPI is asking for commitment on participation 6 to 8 months in advance. Mike said they would probably want the sponsorship payment at that time. Bob said we typically commit to participating but aren't asked for the actual payment until 2018. A new SPI 2018 link will be added to the Upcoming Events page by Mike [AR].

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. The focus continues to be on the ibischk parser.

The IBISCHK6 user guide work in progress can be reviewed at:

http://www.ibis.org/ibischk6/ibischk_6.1.4_UserGuide_wip1.pdf

The Quality task group checklist and other documentation can be found at:

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

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that the group is meeting regularly on Tuesdays at 12:00 p.m. PT. Arpad noted that Walter introduced a new EMD (Electrical Module Description) BIRD proposal in the last meeting. Mike LaBonte and Arpad noted that the EMD proposal discussions will continue in the Interconnect task group meetings after BIRD189 is completed. Arpad noted that BIRD158.6 is currently under discussion in ATM.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak was not available. Mike LaBonte reported that the group was meeting at 8:00 a.m. PT on Wednesdays. The meetings had been suspended, but a meeting was held last week to discuss BIRD189.5 draft changes. The change discussions were based on a review by Arpad Muranyi, and at least one more meeting will be needed in order to finalize the discussions. The group will likely meet on Wednesday, July 19th to continue discussions, though Michael Mirmak may not be available to lead the meeting. The EMD proposal may also be discussed. Walter Katz noted that the changes being discussed for BIRD189.5 were editorial changes for clarification. He noted that there were no functional changes, and that anyone who wants to review the proposal for technical content can use BIRD189.4 and does not need to wait for BIRD189.5 to be posted. Bob Ross agreed with Walter, but said it was important to have the meeting and iron out the editorial changes. Mike LaBonte noted that BIRD189.5 needs to be uploaded to the Interconnect task group archives. At the previous Interconnect meeting, the changes had been discussed but not made to the document real time. Mike had taken the AR in the Interconnect meeting to create the document incorporating the changes. Mike said he was waiting for the Interconnect meeting minutes to be posted so he could be sure he made all the proper changes.

Task group material can be found at:

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

EDITORIAL TASK GROUP

Michael Mirmak was not available. Mike LaBonte reported that meetings are now taking place during the Interconnect task group time slot at 8:00 a.m. PT on Wednesdays if necessary. Mike noted that one meeting had been held since the last Open Forum meeting. BIRD186.3 had been discussed.

Task group material can be found at:

NEW ADMINISTRATIVE ISSUES

- Second revision of IBIS Policies and Procedures

Mike LaBonte reported that he had mailed out the document as a MS Word change markup document showing the differences between the latest draft (draft 11) of the second revision of the IBIS Policies and Procedures and the current IBIS Policies and Procedures. Bob Ross noted that he thought the document had been thoroughly reviewed, was in good shape, and was probably ready for a vote. He noted that the Policies and Procedures require two thirds of all member organizations (rounded up to the next integer) to vote yes. This would currently mean 16 yes votes were required. Bob suggested we wait on scheduling a vote on this until we dealt with the more pressing BIRD issues. Radek Biernacki noted that for the last officer elections we received 15 votes, so getting the required 16 responses was probably doable if the vote were properly announced. Walter Katz suggested that we put extra effort into soliciting votes by email. Mike agreed and said he could send out multiple email solicitations and reinforce the fact that email votes are critical to achieving the required total.

The Policy and Procedures document can be found at:

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

BIRD191: ADDING BUFFER LOCATION TO SI_LOCATION AND TIMING_LOCATION

Bob Ross introduced the BIRD. Bob noted that the main purpose of the BIRD was to sync up the concepts and terminology with the new BIRD189. In the [Component] we have Si_location and Timing_location Sub-Params that have values "Die" or "Pin". Up until 6.1, "Die" meant the same as buffer, and there was no concept of on-die interconnect. Now with BIRD189, there are pin, die-pad, and buffer locations. The intent of this BIRD is to introduce "Buffer" along with "Die" and "Pin" as values for Si_location and Timing_location. The "Buffer" and "Die" options mean the same thing if the new Interconnect Model Set structure is not being used. Bob noted that this had been discussed in ATM, and some had wondered if we really needed this third option. Bob noted that he just wanted consistency with the new BIRD189 locations, and that if the "measurements" were obtained via simulation then you could "measure" at all 3 points. Physically some might be difficult to probe.

Arpad Muranyi noted that he had raised the questions in ATM about whether this was necessary. Originally we had "Pin" and "Die". Die meant the same thing as buffer. If BIRD189 now allows on-die interconnect and separates buffer and die-pad, won't people only be interested in the buffer location? Is there a need for preserving die-pad waveform probing? Couldn't we simply reassign "Die" to mean buffer? Arpad noted an additional complication in [External Model], where A_to_D converters might also need a third location if this change were made. Currently A_to_D converters can be placed at the die pad or on the core side of the receiver. A third option for buffer terminal might need to be added for consistency. Arpad wondered if it would just be easier to keep two choices and reassign the meaning of "Die".

Walter Katz said he thought this was much ado about nothing. He said the currently allowed locations of "Die" and "Pin" were perfectly clear and meet the needs of the industry. He noted that any specification out there is going to be given at the die-pad (for anything faster than

1GHz) or perhaps the pin for slower (<500MHz) technologies. He said the reason for worrying about on-die interconnect was to model return loss, not insertion loss. At this point no specification was worried about the difference between the die pad and the buffer itself, all that was necessary was a good C_comp model. All actual measurements were defined at either the die-pad or the pin. The buffer itself may have some on-die interconnect between it and the die-pad, but the thresholds, timing locations, etc. were all at the die pad.

Arpad said that according to Walter's description the on-die interconnect might be equivalent to the C_comp replacement in Randy Wolff's enhanced C_comp BIRD. Walter agreed and said BIRD158, Randy's enhanced C_comp proposal, or an on-die interconnect model could all be used to replace C_comp.

Bob said one concern was that BIRD189 Interconnect Models allowed a model to go straight from buffer to pin. For such a model there would be no die-pad location available. Mike LaBonte said the model maker would know that and make sure the model stopped at the pad if necessary. Radek said the only interpretation of an Interconnect Model that went from buffer to pin was that there was no meaningful difference between buffer and pad. Arpad noted that if his comment about on-die interconnect serving as glorified C_comp were true, then the simulator would have to take on-die interconnect into account for C_comp compensation. An interconnect model that went straight from buffer to pin would deprive the EDA tool of the ability to do C_comp compensation properly.

Bob suggested that we might be coming around to just doing some wordsmithing in this BIRD and not introducing a new buffer location. Bob suggested we move the discussion to ATM. Walter agreed. Mike LaBonte noted that BIRD191 will be moved to the eligible for vote section of the Open Forum agenda.

BIRD186.3: FILE NAMING RULES

Bob Ross provided one editorial comment, but noted that he felt it should not hold up the vote. This BIRD (in section 3.2, item #4) increases the allowed line length in a file to 1024 characters. The editorial change will replace "120" with "1024" in four other places in the spec where 120 was explicitly stated. The locations of the four changes will be noted in BIRD186.4, which will be created by making these changes to BIRD186.3.

Walter Katz moved to vote on BIRD186.4. Bob seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

Cadence – yes

GLOBALFOUNDRIES – yes

Keysight – yes

Mentor - yes

Micron – yes (by email)

SiSoft – yes

Synopsys -yes

Teraspeed - yes

The roll call vote concluded with a vote tally of Yes – 9, No – 0, Abstain – 0. The motion passed.

BIRD158.5: AMI TS4FILE ANALOG BUFFER MODELS

Bob Ross noted that this was being discussed in ATM, and a BIRD158.6 was being drafted.

BIRD166.2: RESOLVING PROBLEMS WITH REDRIVER INIT FLOW

Arpad Muranyi noted that this BIRD is tabled in ATM. Radek Biernacki moved that we table BIRD166.2 and BIRD190 here in the Open Forum. Walter Katz seconded the motion. There were no objections.

BIRD189.4: INTERCONNECT MODELING USING IBIS-ISS AND TOUCHSTONE

Mike LaBonte noted that this BIRD is currently scheduled for a vote at the next meeting on August 4th. Radek Biernacki and Bob Ross noted that BIRD189.5 was being discussed in the Interconnect task group and might not be ready in time to be voted on at the next meeting.

BIRD190: CLARIFICATION FOR REDRIVER FLOW

Discussion was tabled (see BIRD166.2 above).

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

Discussion was tabled.

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

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.

BIRD181.1: I-V TABLE CLARIFICATIONS

Discussion was tabled.

IBISCHK6 PARSER AND BUG STATUS

Bob Ross reported 6.1.4 source code and executables have been released. Bob moved that we declare release 6.1.4 as accepted by the Open Forum. He said this would complete a line item on the parser development contract. Curtis Clark seconded. There were no objections.

Bob noted that there are currently five new bug reports in process, but none were completed in time for this meeting.

NEW TECHNICAL ISSUES

None.

NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held August 4, 2017. A vote on BIRD189.5 is scheduled, provided that it is uploaded two weeks prior to the meeting. The following IBIS Open Forum teleconference meeting is tentatively scheduled on August 25, 2017.

Curtis Clark moved to adjourn. Arpad Muranyi seconded the motion. The meeting adjourned.

NOTES

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This meeting was conducted in accordance with ANSI guidance.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.
- To subscribe to the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org).
- To subscribe to one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, or ibis-quality@freelists.org.
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: ibischk6, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

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

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

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

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

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

<http://www.ibis.org/bugs/icmchk/>
http://www.ibis.org/bugs/icmchk/icm_bugform.txt

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

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

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

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

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

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

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

SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	May 12, 2017	June 2, 2017	June 23, 2017	July 14, 2017
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	X	-
Cadence Design Systems	User	Active	-	X	X	X
CST	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
GLOBALFOUNDRIES	Producer	Active	X	X	X	X
Huawei Technologies	Producer	Inactive	-	-	-	-
IBM	Producer	Inactive	X	X	-	-
Infineon Technologies AG	Producer	Active	X	-	X	-
IO Methodology	User	Active	X	X	X	-
Keysight Technologies	User	Active	X	X	X	X
Maxim Integrated	Producer	Inactive	-	-	-	-
Mentor, A Siemens Business	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
NXP	Producer	Inactive	-	-	-	-
Qualcomm	Producer	Inactive	-	-	-	-
Raytheon	User	Inactive	-	-	-	-
Signal Integrity Software	User	Active	X	X	X	X
Synopsys	User	Active	X	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-	-	-	-
Zuken	User	Inactive	-	-	-	-

Criteria for SAE 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 standards 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.