



IBIS Open Forum Minutes

Meeting Date: **October 6, 2023**

Meeting Location: **Teleconference**

VOTING MEMBERS AND 2023 PARTICIPANTS

Altair	(JuneSang Lee)
AMD (Xilinx)	(Bassam Mansour)
Ansys	Curtis Clark*, Wei-hsing Huang
Applied Simulation Technology	(Fred Balistreri)
Aurora System	Dian Yang, Raj Raghuram
Broadcom	(Yunong Gan)
Cadence Design Systems	Kyle Lake*, Jared James, John Philips, Kristoffer Skytte
Celestica	(Sophia Feng)
Cisco Systems	(Stephen Searce), Hong Wu
Dassault Systemes	Stefan Paret, Longfei Bai
GE Healthcare Technologies	(Balaji Sankarshanan)
Google	(Hanfeng Wang)
Honeywell	Bavish Vazhayil
Huawei Technologies	Danilo Di Febo, Marco De Stefano, (Hang (Paul) Yan)
Infineon Technologies AG	(Christian Sporrer)
Instituto de Telecomunicações	(Abdelgader Abdalla), Joana Catarina Mendes
Intel Corporation	Chi-te Chen*, Kinger Cai, Michael Mirmak*, Hsinho Wu*
Keysight Technologies	Ming Yan, Douglas Burns, Fangyi Rao, Pegah Alavi, Hee-Soo Lee, Heidi Barnes
Marvell	Steven Parker
MathWorks	Graham Kus*, Walter Katz, Kerry Schotz
Micron Technology	[Randy Wolff], Justin Butterfield, Akshay Shivaji Chaudhari, Dragos Dimitriu
MST EMC Lab	Chulsoon Hwang*, Zhiping Yang*
SerDesDesign.com	John Baprawski
Siemens EDA	Arpad Muranyi*, Weston Beal*, Matthew Leslie, Mikael Stahlberg, Todd Westerhoff, Scott Wedge, Randy Wolff*
STMicroelectronics	Olivier Bayet, Rahul Kumar, Raushan Kumar, Manish-FTM Bansal, Sameer Vashishtha
Synopsys	Ted Mido*, (Tushar Pandey), Wael Dghais
Teraspeed Labs	Bob Ross*
Waymo	[Zhiping Yang], (Ji Zhang)
ZTE Corporation	(Shunlin Zhu)
Zuken	[Michael Schäder], Markus Bücken, Ralf Brüning
Zuken USA	Lance Wang*

OTHER PARTICIPANTS IN 2023

Alphawave Semi	Adrien Auge, Todd Bermensolo
Ciena	Hugues Tournier
Hitachi Ltd.	Yutaka Uematsu
Honeywell	Bavish Vazhayil
India Institute of Technology	Jai Narayan Tripathi, Vinod Verma
Nokia	Ramiro Guzman
OMNIVISION	Sirius Tsang
SAE-ITC	Tammy Patton*
Signal Edge Solutions	Ben Dannan
SI Guys	Donald Telian
Socionext, Inc.	Raymond Yakura
University of Illinois Urbana-Champaign	Jose Schutt-Aine
University of Tunisia, Electronic Laboratory	Malek Souilem
Unaffiliated	Will Hobbs, Mike LaBonte, Jon Powell, Stephen Peters

In the list above, attendees present at the meeting are indicated by “*.” Those submitting an email ballot for their member organization for a scheduled vote 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 connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting

Join on your computer or mobile app

[Click here to join the meeting](#)

Join with a video conferencing device

106010980@teams.bjn.vc

Video Conference ID: 114 666 897 5

[Alternate VTC dialing instructions](#)

Or call in (audio only)

[+1 267-768-8015,554664847#](tel:+12677688015554664847) United States, Philadelphia

Phone Conference ID: 554 664 847#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

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

Lance Wang opened the meeting. Roll Call: Graham Kus reported 11 attendees and that quorum was reached. Lance continued the meeting.

CALL FOR PATENTS

Lance Wang called for declaration of any patents or pending patents related to the IBIS, IBIS-ISS, ICM, or Touchstone 2.0 specifications. Patents were not declared and there was no comment raised regarding specifications.

REVIEW OF MINUTES AND ARS

- Minutes for August 4, 2023 Hybrid IBIS Summit at IEEE EMC_SIP1 2023
- Graham Kus motioned to approve- Bob Ross commented those sets of minutes have to be uploaded in the minutes site on ibis.org/minutes. Lance Wang agreed. Bob Ross seconded the motion. There were no objections. The motion passed.
- Minutes for August 25, 2023 IBIS Open Forum teleconference
- Graham Kus motioned to approve- Bob Ross seconded the motion. There were no objections. The motion passed.
- Minutes for September 15, 2023 IBIS Open Forum teleconference
- Arpad Muranyi moved to approve the minutes. Curtis Clark seconded the motion. The motion passed.

ARs:

- None Listed

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS

Lance Wang called for any new announcements. No new announcements were made.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that there are no changes in the numbers from the last report.

We expect a \$347.88 payment to Steve Parker for the ibis.org URL charge after payment documentation is submitted (Bob mentioned to Steve that this still has not been submitted to the Treasurer).

We expect payments for the Asian IBIS Summit (Shanghai) based on the number of participants or minimum contract charge. We also expect another Shanghai sponsorship payment – approximately \$1500, in progress.

Based on quote, we expect to pay the parser developer for IBISCHK721 in 2023 approximately \$1000, if it is finished. There may be some bug discussion in the IBIS parser section of the meeting.

\$17,245 Balance for 2023.

\$22,295 Adjusted Balance for 2023 (Note, 2020 ZTE sponsorship moved forward to 2023).

WEBSITE ADMINISTRATION

Lance Wang reported for Steven Parker that there were no updates.

MAILING LIST

Curtis Clark reported some long-term subscribers have bounced, but it appeared to be a transient IT issue and was resolved.

LIBRARY UPDATE

Zhiping Yang reported no email or other updates at this time.

UNIVERSITY RELATIONS

Professor Chulsoon Hwang reported no updates.

INTERNATIONAL/EXTERNAL ACTIVITIES

Conferences:

Lance Wang reported no updates.

Press Updates

Lance Wang reported no updates.

Related Standards

Michael Mirmak reported DASC updates as follows, alerted them to some interconnect work going on for LPB and Touchstone have overlap, for the Asian Summits- particularly in Japan, and may want to coordinate an LPB update as that is up for renewal with IEEE next year.

LSI Package Board (It is a standard that JEITA developed in 2019 to in essence regularize the die package board connections in physical connectivity as well as modelling). IEEE standard.

There was discussion about LBP overlap with IBIS EMD format. Michael agreed this was a reason to engage.

IBIS Summit Planning and Review:

- Asian Summits (November 2023)
- China IBIS Summit
 - Location:
Parkyard Hotel, Shanghai, November 10, 2023, 8:30am-5pm
 - Sponsors:
ANSYS, Inc.
Cadence, Inc.
Others (TBD) in process of establishing sponsorship.
 - Registrations and Presentations ongoing.
 - Bob Ross expressed that there are approximately \$7k in related expenses which would be offset by sponsorship, and anticipated this would be a break-even from a cost standpoint. Zhiping Yang stated he would be attending in person, and may be able to assist as needed.

- Japan IBIS Summit (organized by JEITA)
 - Location:
TBD, Tokyo, November 14, 2023 9:00-12:00 (JST)
 - Organization Sponsors: IBIS Open Forum, JEITA
 - Sponsors:
ANSYS, Inc.
Apollo Giken Co.
Keysight Technologies Japan K.K.
Toshiba Corporation
Zuken Inc.
Others (TBD) in process of establishing sponsorship.
 - Registrations and Presentations ongoing.
 - Randy Wolff summarized some of the initial presentations, while others are anticipated to be added.
 - Lance Wang reported that JEITA would like to hold a session with a topic of communication between JEITA and IBIS Open Forum regarding modeling concepts, methodologies, and specifications. Zhiping Yang stated that he would be able to assist during this conference in person if needed. Lance stated that hotels near the conference are listed by JEITA on their site. Ted Mido stated the JEITA building is convenient to locate, as it lies next to Kojimachi Station, one of the largest subway terminals across from Tokyo Metro Station (Yurakucho Line). Bob Ross asked Zhiping if he had presentations, and Zhiping responded he would present on IBIS.

- DesignCon IBIS Summit 2024
 - Location:
Santa Clara, February 2, 2024 (Mission Towers, 3975 Freedom Circle, Santa Clara, CA, Location sponsored by The MathWorks, Inc.)
 - Sponsors:
The MathWorks, Inc.
Others (TBD) in process of establishing sponsorship.
 - Randy Wolff stated we can look into using the same catering vendor as the previous year. There may be some accommodation in discounts. Bob stated IBIS Summits normally provide complementary lunch and agreed it should be catered again. Last year IBIS spent costs minus a discount due to a vehicle break down until the

Anniversary cake could get delivered. Normally we get a few other sponsors for catering and other factors.

- Lance Wang asked for a motion to accept the hosting of the DesignCon 2024 IBIS Summit at the Mission Towers complex as sponsored by The MathWorks, Inc. Graham Kus motioned to approve. Bob Ross seconded the motion. There were no objections. The motion was approved.

QUALITY TASK GROUP

Bob Ross reported there was an update for instructions for the spreadsheet for Quality Task Group from version 2 to support version 3. There may be a presentation ready by DesignCon 2024. Weston Beal stated he is working on that presentation and anticipates to present this at the DesignCon 2024 IBIS Summit. Bob stated that Randy Wolff may also help on the original presentation 10 years ago on the source files. Bob mentioned a second topic, a Touchstone 2.1.0 parser which would support different reference impedances for port references. This would be a topic of the presentation in Asian IBIS Summit. The mathematics is straight forward but the IBIS Parser developer would have to add those capabilities. Bob stated we have not finished scoping the specification for Touchstone 2.1.0 yet. This topic may be discussed with the Parser developer for IBIS7.2.1 as a bug fix response.

Lance Wang asked for questions. None were asked.

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

https://www.ibis.org/quality_ver3.0/

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported Tuesdays at 12:00 noon Pacific Time, most recent meetings proposal to provide test load and simulation for AMI executable models. Nearing completion and anticipate bringing to the Open Forum for consideration.

Lance Wang asked for questions. None were asked.

Note: Task group material can be found at:

http://www.IBIS.org/macromodel_wip/

INTERCONNECT TASK GROUP

Michael Mirmak reported there are currently 3 activities:

1. Pole-residue inclusion in Touchstone format.
2. Port mapping as potential new feature, including what sub features such as connectivity and other topics of consideration.
3. Touchstone 2.1 as a new document. We are about 1/3 of the way through reviewing first draft of this document, anticipate bringing before the IBIS Open Forum.

Note: Task group material can be found at:

http://www.IBIS.org/interconnect_wip/

EDITORIAL TASK GROUP

Michael Mirmak reported no updates.

Note: Task group material can be found at:

http://www.IBIS.org/editorial_wip/

NEW ADMINISTRATIVE ISSUES

A motion concerning Touchstone 2.1:

Michael Mirmak reported Touchstone 2.1 document is assembled as an effort to combine 4 TSIRDs. This is to make changes to Touchstone and define what 2.1 would include. For the most part these are clarifications or fixes to errors (with exception to 5.1, which is per-port references to the option line) outside of the references keyword in Touchstone 2.

This allows editorial Task Group to re-convene so that the draft can be considered. Also, to note that it is possible some additional TSIRD have to be released due to technical issues as we go through the editorial process.

Michael Mirmak motioned to define 2.1 to include the changes.

Bob Ross stated there seemed to be 2 motions, one to adopt this motion, and the other is to convene the Editorial Task Group. The question being, do we use the same time slot or create a new one for Editorial Task Group. We could continue the Interconnect Task Group, unless there is a motion to move to another time slot.

Arpad Muranyi proposed to move on this proposal first, to approve these additions to the Touchstone 2.1 specification, to compile these TSIRDs into specification. Arpad asked to consider this topic first.

Michael motioned to assemble the TSIRD3, TSIRD4.1, TSIRD5.1 and TSIRD6 into the document, Arpad seconded the motion. There were no objections. The motion passed.

Michael motioned to restart the editorial Task Group. Arpad seconding the motion. There were no objections. The motion passed.

Lance Wang thanked everyone for their comments.

ROLL CALL

Mid-meeting roll call: Graham Kus took the roll call and reported 10 attendees.

TECHNICAL DISCUSSION

BIRD223.1

On behalf of Kinger Cai, Chi-te Chen reported that the SPIM file has to be separate from IBIS file, and there were other clarifications.

Arpad Muranyi reported the ATM group is finished discussing this topic reported by Chi-te. BIRD223.1 Add Support for SPIM in IBIS. Arpad stated the ATM group is completed with discussions.

Link to BIRD223.1:

<https://IBIS.org/BIRDs/BIRD223.1.docx>

NEW AND REVISED *IRDS

IRDS SCHEDULED FOR VOTE

IRDS ELIGIBLE FOR VOTE

BIRD226: PSIJ Sensitivity – Cai et al

Notes: Chi-te stated that BIRD220 discusses more actual IO buffer related issues versus BIRD226. There was some discussion whether to combine these BIRDS or keep them separated. Chi-te stated on behalf of Kinger Cai, that there is a preference to keep them separate as SPIM is platform specific focused. Randy Wolff agreed there was no apparent overlap for these topics. Arpad Muranyi asked if someone makes a model that utilizes both BIRDS, would it be possible to double-count for effects? Or is it a moot point. Randy stated BIRD226 is more an AMI simulation or usage of Jitter in AMI calculations. BIRD220 is more a transient simulation focus, simulation with traditional IBIS buffer model. Randy stated he does not know how a simulation could be constructed to run or combine the two.

Graham Kus suggested that the IBIS specification could be enhanced to include statement to avoid placing the same technical content in both formats of the same model- in other words to provide guidance in regards to creating the model, where the IBIS specification states to model maker EDA vendors to avoid double counting. Arpad asked if there would be evaluation of this in Editorial Task Group. Professor Chulsoon Hwang stated there is nothing to add. Randy stated there is not yet a section that currently discusses PSIJ. It would be something where to consider where to locate statements or guidance.

Randy stated that BIRD220 has been on the table for 9 months, and the two BIRDS could be considered for adoption.

Lance asked for motion to vote on BIRD226 or BIRD220 or we can table for another meeting. There was no motion- instead, there was group discussion. Randy stated he is fine waiting for a future meeting for this motion consideration. Lance agreed that next meeting there could be a motion to schedule a vote.

TABLED IRDS: (NO DISCUSSION WITHOUT MOTION TO "UNTABLE")

Lance reported no tabled IRDs.

IBISCHK AND TSCHK PARSER AND BUG STATUS

IBISCHK Parser: Bob Ross reported that the main point is the Parser developer provided a conditional estimate of \$1k but not necessarily everything in BUG243, and which warning messages we wish to really deal with. There are many compile warning messages. The bug report for BUG243 was discussed. Bob stated the parser developer was requesting either a prioritization or a classification of which work needed to be completed. This may affect the quote as well as it is work. The idea is to avoid open-ended or perhaps end up being a 1-year project in scope, so that is the motivation to classify priority.

Randy Wolff stated that BUG243 was submitted by a few EDA vendors, how do we determine if the Parser developer has fixed what needed to be fixed, do we send a version of the parser to a few of these folks?

There was group discussion about MathWorks and Ansys and the compiler warnings such as missing variables. Randy asked if there would be compile options being used, and the parser developer could duplicate that in testing.

Bob stated one of the set of errors was that some variables were not properly initialized.

This would be discussed in Quality Task Group.

Kyle Lake related on a topic regarding pin names. He reported a customer issue where the pin name specification for 5 characters long, versus a practical pin name “100_xyz” or “200_xyz” could be longer- for example, the IBIS Parser is truncating pin names down to 5 characters. Kyle reported having to go back and manually edit the file to remove or truncate. He asked the group if this has also been an issue for others?

Michael Mirmak stated there is a 5 character pin limit in the first column. This touches on other column character limits. He suggested at this point, a 16 char might make more sense, that is, to ask, would 16 characters be enough?

Kyle stated around 20 is what the customer is looking for.

Randy Wolff stated that there may be another problem, BIRD216 alphanumeric pin names, we listed what alphanumeric meant, which does not include underscore characters. The underscore may be something that is checked in IBIS 7 or 7.2, and the customer may not checking this. Kyle stated he would go back and investigate.

Bob Ross stated the motivation was not what the EDA tool generates, but what is in a specification for the device itself. It might appear in Databook or datasheet. Arpad Muranyi stated the 5 character limit was written in the 1990's decade, and the larger device BGA may have larger characters – for example, a 256-pin BGA may be large by 1998 standards, whereas a 2048-pin BGA would represent a 2023 CPU. The question of how is this related to the line length limitation, there was originally a line length limitation of 80 characters in the MS-DOS OS for text files.

Bob stated we support 120 characters vs. 80 for line length. While the 80 character limits was a MS-DOS based limit for text files, we probably should have never put character limits on anything. For the IBIS specification to change, the Parser and Specification edits would be potentially a major upgrade.

Arpad Muryani asked if we would write up a BIRD. Michael stated he had already started writing a BIRD as the industry seems to support extending the PIN name.

There was no motion made.

Lance Wang asked for questions. None were asked.

NEW TECHNICAL ISSUES

Lance Wang reported no new Technical Issues.

NEXT MEETING AGENDA AND SCHEDULING

Lance Wang announced that the next IBIS Open Forum teleconference meeting would be October 27, 2023, followed by a teleconference meeting November 17, 2023.

Arpad Muranyi motioned to adjourn. Curtis Clark seconded. There were no objections. The motion passed. The meeting was adjourned.

NOTES

IBIS CHAIR: Lance Wang (978) 633-3388

lance.wang@ibis.org

Solutions Architect, Zuken USA
238 Littleton Road, Suite 100
Westford, MA 01886

VICE CHAIR: Randy Wolff

vice-chair@ibis.org

Product Architect, Siemens EDA

SECRETARY: Graham Kus

graham.kus@ibis.org

Senior Engineer, The MathWorks, Inc.
3 Apple Hill Drive
Natick, MA 01760

TREASURER: Bob Ross (503) 246-8048

bob@teraspeedlabs.com

Engineer, Teraspeed Labs
10238 SW Lancaster Road
Portland, OR 97219

LIBRARIAN: Zhiping Yang

YangZhip@mst.edu

WEBMASTER: Steven Parker (845) 372-3294

sparker@marvell.com

Senior Staff Engineer, DSP, Marvell
2070 Route 52
Hopewell Junction, NY 12533-3507

POSTMASTER: Curtis Clark

curtis.clark@ansys.com

Ansys, Inc.
400 Fifth Avenue
Suite 500
Waltham, MA 02451

This meeting was conducted in accordance with SAE ITC guidelines.

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 or unsubscribe from the official IBIS@freelists.org and/or IBIS-users@freelists.org email lists (formerly IBIS@eda.org and IBIS-users@eda.org):
 - <https://www.freelists.org/list/IBIS>
 - <https://www.freelists.org/list/IBIS-users>
- To subscribe to or unsubscribe from one of the Task Group email lists: IBIS-macro@freelists.org, IBIS-interconn@freelists.org, IBIS-editorial@freelists.org, or IBIS-quality@freelists.org:
 - <https://www.freelists.org/list/IBIS-macro>
 - <https://www.freelists.org/list/IBIS-interconn>
 - <https://www.freelists.org/list/IBIS-editorial>
 - <https://www.freelists.org/list/IBIS-quality>
- 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: IBISchk7, 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 (attendee X; absent -)

Organization	Interest Category	Standards Ballot Voting Status	Aug 4, 2023	Aug 25, 2023	Sept 15, 2023	Oct 6, 2023
Altair	User	Inactive	-	-	-	-
AMD (Xilinx)	Producer	Inactive	-	-	-	-
Ansys	User	Active	-	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Aurora System	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	-	X	X	X
Celestica	User	Inactive	-	-	-	-
Cisco Systems	User	Inactive	X	-	-	-
Dassault Systemes	User	Inactive	X	-	-	-
GE Healthcare Technologies	User	Inactive	-	-	-	-
Google	User	Inactive	-	-	-	-
Honeywell	User	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
Keysight Technologies	User	Inactive	-	-	-	-
Marvell	Producer	Inactive	-	-	X	-
MathWorks	User	Active	X	-	X	X
Micron Technology	Producer	Inactive	-	-	X	-
MST EMC Lab	User	Active	X	X	X	X
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA	User	Active	X	X	X	X
STMicroelectronics	Producer	Inactive	X	-	-	-
Synopsys	User	Active	-	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Waymo	User	Inactive	-	-	-	-
ZTE Corp.	User	Inactive	-	-	-	-
Zuken	User	Active	X	X	X	X

= Temporarily not a voting member

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 (voting by email counts as attendance)

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.