IBIS Open Forum Minutes

Meeting Date: **March 11, 2022**
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2022 PARTICIPANTS

Analog Devices (Maxim Integrated)	Tushar Pandey, Jermaine Lim
ANSYS	Curtis Clark*
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan)
Cadence Design Systems	Zhen Mu^
Celestica	(Sophia Feng)
Cisco Systems	(Stephen Scearce)
Dassault Systemes	(Stefan Paret)
Ericsson	(Guohua Wang)
Google	(Hanfeng Wang)
Huawei Technologies	(Hang (Paul) Yan)
Infineon Technologies AG	(Christian Sporrer)
Instituto de Telecomunicações	(Abdelgader Abdalla)
Intel Corporation	Hsinho Wu*, Michael Mirmak*
Keysight Technologies	Radek Biernacki*, Ming Yan*
Luminous Computing	(David Banas)
Marvell	Steven Parker*
MathWorks	Mike LaBonte*, Walter Katz*
Micron Technology	Randy Wolff*
MST EMC Lab	(Chulsoon Hwang)
SerDesDesign.com	(John Baprawski)
Siemens EDA	Arpad Muranyi*, Weston Beal*
STMicroelectronics	(Olivier Bayet)
Synopsys	Ted Mido*
Teraspeed Labs	Bob Ross*
Xilinx	(Bassam Mansour)
Waymo	Zhiping Yang*
ZTE Corporation	(Shunlin Zhu)
Zuken	(Michael Schäder)
Zuken USA	Lance Wang*

OTHER PARTICIPANTS IN 2022

None

In the list above, attendees 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#   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

Mike LaBonte declared that a quorum had been reached.

CALL FOR PATENTS

Randy Wolff called for declaration of any patents or pending patents related to the IBIS, IBIS-ISS, ICM, or Touchstone 2.0 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS

Randy Wolff called for comments on the minutes of the February 18, 2022, IBIS Open Forum teleconference. Curtis Clark moved to approve the minutes. Radek Biernacki seconded the motion. There were no objections.

Randy reviewed ARs from the previous meeting.
- Randy Wolff to write IBIS 7.1 article for Signal Integrity Journal [AR]
  Randy reported the article might be finished that day.
- Randy Wolff to send vote solicitation email for BIRD216 [AR]
  Randy said this was done.
- Randy Wolff to send vote solicitation email for BIRD217 [AR]
  Randy said this was done.

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS

Randy Wolff said the IEEE SPI conference had been added to the agenda.

Ming Yan introduced himself, saying he worked for Keysight Technologies. He had been working with Radek Biernacki on IBIS models since 2006. Radek said Ming had attended IBIS meetings and summits in the past.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that we had 19 renewed and new members. Unpaid returning companies would be dropped from membership at the end of May. We had a balance of $16,993, and a balance adjusted for 2022 attribution of $20,343. Bob said the SAE ITC charge for 2021 would increase from $6,000 to $6,500. Bob had sent payment reminders, and five more membership payments were in process. There may be expenses for summits, that was still unknown.

WEBSITE ADMINISTRATION

Randy Wolff said minutes from IBIS meetings had been posted, and the summits web page had been updated. Randy said webmaster Steven Parker would be working on the IBISCHK bug page, to add a "Supported Version" column to the bug table. The new TSIRD4 had been posted to the TSCHK bug page. Steven would be building a new page for ISSIRDs. A link to that would be added to the IBIS home page. The IBIS-ISS page, currently just a directory listing, would finally have HTML formatting.

Bob Ross suggested the home page navigation panel could have more specification links, in addition to the links found in "Our Specifications". Randy agreed. Randy said the Specifications page also should be modernized and cleaned up.

MAILING LIST ADMINISTRATION

Curtis Clark reported that we had 3 new list subscribers, and things were going smoothly.

LIBRARY UPDATE

No report.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

Randy Wolff said we would begin reporting on IEEE SPI 2022, to be held in Siegen, Germany, May 22 to 25.

> https://spi2022.uni-siegen.de/

- Press Updates

None.

- Related standards

IEC 63055/IEEE 2401, JEITA "LPB"

Michael Mirmak said he had received questions from DASC about when IBIS would have updates related to LPB.

SUMMIT PLANNING AND REVIEW

Randy Wolff said the third DesignCon 2022 summit announcement had been sent. The summit would be held Friday, April 8, as a hybrid event. Logistics were still being worked out. Room and meal arrangements were being made with the Hyatt Hotel. The contract had been signed. Email blasts for DesignCon were being sent by agreement. There might be some open discussion time after lunch. Bob Ross said Keysight, and Synopsys were sponsors. Randy

thanked the sponsors. Arpad Muranyi and Weston Beal were able to suggest someone at Siemens EDA for Bob to contact about sponsorship.

Bob listed presentations that were planned, inviting others to present if they were able. Randy noted that presentations did not need to be given in-person. Bob reminded those planning to attend to register with Lance Wang. Lance said he had 11 registered, 10 in-person. There might be 2 or 3 virtual presenters to add. Weston Beal asked if virtual attendees should register. Randy said they should.

Randy said we might have a hybrid event at IEEE SPI, at University of Siegen. Bob knew of IBIS experts intending to travel to the conference. He said any event we held would be in the evening at the location, to accommodate U.S. attendees. Randy said we had time to work out the logistics.

Randy said IEEE SIPI would be held August 6 in Spokane, Washington. Randy and Zhiping Yang would be there, and possibly other IBIS experts. Plans were being made to have IBIS content in some form.

QUALITY TASK GROUP

Mike LaBonte said the group meets on Tuesdays at 9:00 a.m. PT. The group had reviewed IBISCHK BUG227. They had discussed the Supporting Version column to the IBISCHK bug page. Arpad Muranyi said John Angulo had found a bug that would be reported, involving null pointers with [Model Spec] parameters. It was a crash bug, causing IBISCHK to not declare a syntax error, but also it did not declare success. Bob Ross said he had not yet received the report.

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 meets on Tuesdays at 12:00 a.m. PT. They had talked about the PAMn BIRD213.1 draft 17, which had not yet been submitted. A proposed new AMI parameter had been changed from Table format to String format.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak reported the group was meeting on Wednesdays at 8:00 a.m. PT. They had discussed what should be in a new Touchstone 3 specification. One proposal related to port associations. Randy Wolff said a template TSIRD document in Microsoft Word format had been created. The existing template was plain text, whereas the Touchstone specification was in Microsoft Word format, making some change proposals harder to express accurately.

Task group material can be found at:

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

EDITORIAL TASK GROUP

Randy Wolff reported that the group remained suspended. Arpad Muranyi asked about the expected timeline for working on a new IBIS specification, now that we had new BIRDs completed and nearing completion. Michael said the group could be reconvened once the expected BIRDs were submitted and approved

Task group material can be found at:

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

NEW ADMINISTRATIVE ISSUES

Michael Mirmak showed the new ISSIRD template document. He said it was based on the BIRD template, which also was in Microsoft Word format because it was related to a Microsoft Word formatted specification. He said the IBIS-ISS formatting style was similar to the material donated by Synopsys. Michael noted some IBIS-ISS terminology definitions that might not be adhered to. Bob Ross asked if it was ready for a motion. Radek Biernacki suggested giving the template more review time.

Weston Beal asked about the provisions for showing old content and suggested new content. Michael said IBIS BIRDs had been using different styles for AMI and other parts of IBIS. The structure of IBIS-ISS was not that well defined. Weston said it might not be clear what text is desired. Michael said it would not be trivial to make the change. Randy Wolff felt it would be worthwhile once we had ISSIRDs to work with. Michael said the BIRD template had been revised three times. Randy felt that could use yet another revision. Michael noted that an ISSIRD was under consideration, but it did not need to wait for the template to be finalized.

Michael Mirmak to send ISSIRD draft to IBIS reflector for review [AR]

Randy showed the IBIS 7.1 Known Issues document. Item 6 had been added, concerning a typographical error found by Arpad Muranyi, involving PAM4 threshold AMI parameters.

NEW AND REVISED *IRDS:

BIRD218: DESIGNATOR PIN LIST RELAXATION

Randy Wolff showed the BIRD. Arpad Muranyi introduced it, saying it relaxed the requirement for all pins to be listed in [Designator Pin List] sections of EMD files. In some cases, not every pin needed to be modeled. Arpad felt the BIRD should be ready for a vote. Randy noted that "NC" had also been added as an allowed signal_type in the [Designator Pin List]. Arpad said that had originally been omitted, but it might be sometimes required to avoid defining unwanted connections. Randy said the BIRD added flexibility.

Arpad wondered if any existing models would violate the new rules. Randy said no terminal lines could exist for NC pins under current rules. Bob Ross said an IBIS 7.2 model downgraded to 7.1 could violate the rules. Arpad said the Interconnect Task Group had a quick vote to submit the BIRD. Arpad asked people to review the BIRD, saying a vote might be scheduled later.

TSIRD4: [END] KEYWORD CORRECTIONS AND OTHER EDITORIAL

Randy Wolff showed the TSIRD. Michael Mirmak introduced the TSIRD, saying the document was a hybrid Microsoft Word document. He said most of Touchstone had been written before a

parser was available, and the examples could not be checked at the time. Some examples lacked the [End] keyword. An instance of [Two Port Data Order] had a typographical error. One example had an extra option line. He said example 15 was not supposed to be a syntax example, and colons had been added to fix it.

Arpad Muranyi felt numbers should not begin with a dot ".", and they should always have a leading "0". Michael said the numbers passed the parser without the leading zero, asking if leading zeros should be required. Arpad felt it should only be recommended, and that setting a precedent by showing it that way in the examples would help. Michael agreed. Randy said the update could wait until after further review. Mike LaBonte said the tschk2 parser might output files with leading zeros filled in, but he wasn't sure. Radek Biernacki said the example formatting without leading zeros might have been intentional. Bob Ross said the existing document had a mix of formats, but all were legal. Mike said tschk2 used the "strtod" function to parse numbers, which handled all legal POSIX number formats. Arpad asked if multiple leading zeros would be handled. Mike felt they would.

Michael Mirmak to confirm that leading zeros and exponents are allowed in Touchstone 2.0 [AR]

*IRDS SCHEDULED FOR VOTE:

BIRD216: ALPHANUMERIC PIN NAMES

Randy Wolff showed the BIRD. Arpad Muranyi said it made IBIS more consistent, where some keywords required alphanumeric pin names, and [Pin] did not. The term "designator string" had been removed, because it had a specific meaning elsewhere. Arpad moved to vote on the BIRD. Curtis Clark seconded. Bob Ross noted that a new parser check would be required. He had not seen any example of IBIS files containing a non-alphanumeric pin name. There were no objections to the motion to vote.

The roll call vote tally was:

- ANSYS – yes
- Cadence – yes (email vote)
- Intel – yes
- Keysight – yes
- MathWorks – yes
- Micron Technology – yes
- Siemens EDA – yes
- Synopsys – yes
- Teraspeed Labs – yes
- Zuken – yes

The vote passed.

Randy Wolff to update BIRD216 to reflect approval [AR]

BIRD217: REQUIRE CLOCKED RX MODELS TO RETURN CLOCK TIMES

Randy Wolff showed the BIRD. Arpad Muranyi said he had received no comments. He said IBIS 7.1 supported clocked IBIS-AMI models, but clock_times return from AMI_GetWave was optional. EDA tools would not know what to do if there were no clock_times, since classic serdes clock recovery by the EDA tool was not appropriate in that case. The solution was to

require clock_times output when Rx_Use_Clock_Input was used. Another change was to highly recommend clock_times output for standard serdes models.

Arpad moved to vote on the BIRD. Curtis Clark seconded. There were no objections.

The roll call vote tally was:

- ANSYS – yes
- Cadence – yes (email vote)
- Intel – yes
- Keysight – yes
- MathWorks – yes
- Micron Technology – yes
- Siemens EDA – yes
- Synopsys – yes
- Teraspeed Labs – yes
- Zuken – yes

Randy Wolff to update BIRD216 to reflect approval [AR]

*IRDS ELIGIBLE FOR VOTE:

BIRD211.4: IBIS AMI REFERENCE FLOW IMPROVEMENTS

Randy Wolff showed the BIRD. Walter Katz said other BIRDs would be rejected if this passed. He said the flows covered were redriver flows. The second Rx could optimize itself only if it had upstream channel effects at its input, but the current flow applied that to the second Rx output. The Tx_Impulse_Input AMI parameter allowed the model maker to choose from multiple flows. Walter said the original flow was deprecated, and the new parameter would be required for IBIS 7.2 models.

Arpad Muranyi moved to schedule a vote to be held in the next meeting. He noted, however, that the document referenced IBIS 7.0 in some places, asking if changing those to IBIS 7.1 would require an updated BIRD. Randy said the proposed changes could be part of a motion to vote. Walter Katz seconded the motion. There were no objections.

Randy Wolff to send vote solicitation for BIRD211.4 [AR]

BIRD213: EXTENDING IBIS-AMI FOR PAMn ANALYSIS

Randy Wolff showed the BIRD. Arpad Muranyi said an update would be coming soon.

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

BIRD166.4: RESOLVING PROBLEMS WITH REDRIVER INIT FLOW

Discussion was tabled.

BIRD181.1: I-V TABLE CLARIFICATIONS

Discussion was tabled.

BIRD190: CLARIFICATION FOR REDRIVER FLOW

Discussion was tabled.

BIRD210: NEW REDRIVER AMI FLOW

Discussion was tabled.

IBISCHK AND TSCHK PARSER AND BUG STATUS

Bob Ross said all new bugs had been previously classified, and he would be looking for the bug report from Siemens EDA. Michael Mirmak asked what BIRDs would be required to proceed on BUG227. Mike LaBonte said proposed [Test Load] enhancements and the root name matching clarification would be needed.

NEW TECHNICAL ISSUES

None.

NEXT MEETING

The next IBIS Open Forum teleconference meeting would be held on April 1, 2022. The DesignCon 2022 IBIS Summit would be held April 8, 2022. The following IBIS Open Forum teleconference meeting was tentatively scheduled for April 22, 2022.

Bob Ross moved to adjourn. Michael Mirmak seconded the motion. The meeting adjourned.

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NOTES

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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: 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

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SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	January 7, 2022	January 28, 2022	February 18, 2022	March 11, 2022
Analog Devices (Maxim Integrated)	Producer	Inactive	-	-	X	-
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	-	X	X	-
Celestica	User	Inactive	-	-	-	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
Google	User	Inactive	X	-	-	-
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	Active	X	X	X	X
Luminous Computing	General Interest	Inactive	-	-	-	-
Marvell	Producer	Active	X	X	X	-
MathWorks (SiSoft)	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
MST EMC Lab	User	Inactive	-	-	-	-
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA (Mentor)	User	Active	X	X	X	X
STMicroelectronics	Producer	Inactive	-	-	-	-
Synopsys	User	Active	X	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Waymo	User	Inactive	-	X	X	-
Xilinx	Producer	Inactive	-	-	-	-
ZTE Corp.	User	Inactive	-	-	-	-
Zuken	User	Active	X	X	-	X

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.