IBIS Open Forum Minutes

Meeting Date: June 28, 2019
Meeting Location: Teleconference

VOTING MEMBERS AND 2019 PARTICIPANTS

ANSYS	Curtis Clark*, Marko Marin, Miyo Kawata Toru Watanabe, Akira Ohta
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan)
Cadence Design Systems	[Brad Brim], Ambrish Varma, Ken Willis Yingxin Sun, Zhen Mu
Cisco Systems	(Stephen Scearce)
Dassault Systemes (CST)	Stefan Paret, Longfei Bai
Ericsson	Anders Ekholm, Anders Vennergrund, Felix Mbairi Hui Zhou, Inmyung Song, Mattias Lundqvist Wenyan Xie, Zilwan Mahmod
GLOBALFOUNDRIES	Steve Parker*
Google	Zhiping Yang, Songping Wu
Huawei Technologies	Antonio Ciccomancini
Futurewei Technologies	Albert Baek
IBM	Michael Cohen*, Greg Edlund
Infineon Technologies AG	Anke Sauerbrey, Pietro Brenner, Francesco Settino
Instituto de Telecomunicações	(Abdelgader Abdalla)
Intel Corporation	Hsinho Wu*, Michael Mirmak*, Nhan Phan Kinger Cai, Eddie Frie, Wendem Beyene Yuanhong Zhao
Keysight Technologies	Radek Biernacki*, Hee-Soo Lee, Stephen Slater Jian Yang, Ming Yan, Pegah Alavi
Maxim Integrated	Joe Engert, Yan Liang, Charles Ganal
Mentor, A Siemens Business	Arpad Muranyi*, Raj Raghuram, Weston Beal Vladimir Dmitriev-Zdorov, Mikael Stahlberg Todd Westerhoff, Ed Bartlett, Nitin Bhagwath
Micron Technology	Randy Wolff*, Justin Butterfield*
NXP	(John Burnett)
SiSoft (MathWorks)	Mike LaBonte*, Graham Kus, Walter Katz*
SPISim	Wei-hsing Huang
Synopsys	Ted Mido, Adrien Auge, John Ellis, Sam Sim Scott Wedge
Teraspeed Labs	Bob Ross*
Xilinx	Ravindra Gali
ZTE Corporation	(Shunlin Zhu)

| Zuken | Michael Schäder |
| Zuken USA | Lance Wang |

OTHER PARTICIPANTS IN 2019

Apollo Giken Co.	Satoshi Endo
AVL	Wolfgang Röhrner
Carleton University	Ram Achar
Continental	Stefanie Schatt
Hitachi	Norio Chujo
IO Methodology	[Lance Wang]
John Baprawski, Inc.	John Baprawski
Hamburg University of Technology	Til Hillebrecht
KEI Systems	Shinichi Maeda
Marvell	Johann Nittmann
OmniVision	Sirius Tsang
Politecnico di Torino	Stefano Grivet-Talocia, Paolo Manfredi
	Alessandro Zanco
Qualcomm	Kevin Roselle
Raytheon	Joseph Aday
Renesas	Genichi Tanaka
Ricoh Co.	Kazuki Murata
SAE ITC	(Jose Godoy)
Seagate	Alex Tain
Signal Metrics	Ron Olisar
Silvaco Japan Co.	Yoshiharu Furui
Socionext	Megumi Ono, Motoaki Matsumura, Yuji Nakagawa
STMicroelectronics	Olivier Bayet, Aurora Sanna
Toshiba	Imi Hitoshi
Toshiba Electronic Devices & Storage Corp.	Atsushi Tomishima
Université de Bretagne Occidentale	Mihai Telescu
University of Cassino	Antonio Maffucci
University of Toronto	Fadime Bekmambetova
University of Zagreb	Adrijan Baric

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 |
| July 19, 2019 | 624 227 121 | IBISfriday11 |

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

http://tinyurl.com/IBISfriday

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. Randy Wolff thanked the previous officers for their service to IBIS, particularly Bob Ross and Mike LaBonte.

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 June 7, 2019 IBIS Open Forum teleconference. Mike LaBonte moved to approve the minutes. Radek Biernacki seconded the motion. There were no objections.

Randy reviewed ARs from the previous meeting.

1. Mike LaBonte to fix the dates for the Asian IBIS Summits on the website [AR].
   Mike reported he and Steve Parker had taken care of it.
2. Mike to update the status of BIRD199 on the website [AR].
   Mike reported it was updated to show BIRD199 as accepted on June 7, 2019.

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS
None.

MEMBERSHIP STATUS AND TREASURER'S REPORT
Bob Ross reported we have 26 members, having recently received IBM's payment.

We have $13,368 cash flow for 2019 and a $16,118 adjusted balance for 2019.   Bob noted that we could gain one or two more members in the near future, but this is not certain.

WEBSITE ADMINISTRATION

Steve Parker reported that he was getting up to speed, and he thanked Mike LaBonte for taking him through the setup and scripts. Steve reported that he had updated the IBIS Officer listings and associated email addresses per the recent elections. He had also changed the Officer listings for the SPI IBIS Summit page because the summit occurred after the elections. He had also posted Quality and ATM task group minutes and posted BIRD197.3 as he ramped up. He encouraged people to send website questions to him.

Randy Wolff noted some email conversations about updating the website. He said he'd received one comment that it was not obvious how one would sign up for the IBIS Open Forum mailing list. He said we might consider adding new instructions for joining mailing lists and the teleconferences.

MAILING LIST ADMINISTRATION
Mike LaBonte thanked Curtis Clark for leaving the lists in good shape. Mike reported the only issue encountered during the handoff was setting up admin rights for the China Regional Forum list, but this had been resolved.

Mike said that we typically only think of the lists hosted at freelists.org. However, he noted that we also have info@ibis.org for general inquiries and have recently added touchstone@ibis.org for people who have questions or feedback about Touchstone. Mike noted that email to those addresses is currently sent to the Postmaster, but they are constructed such that others could be added as recipients. Michael Mirmak asked if we would want task group chairs to receive them. He also asked if we should have addresses for the task group chairs. Mike said we could create them if people are interested.

LIBRARY UPDATE
No update.

INTERNATIONAL/EXTERNAL ACTIVITIES
- Conferences
EDI CON is a web-based conference held September 10-12, 2019. The third day has some SI/PI content with some prominent experts giving presentations. More information is available at:

> https://www.edicononline.com/

- Press Update
Mike LaBonte reported he wrote an article about the release of IBIS 7.0 for the Signal Integrity Journal. The article is found at:

> https://www.signalintegrityjournal.com/blogs/12-fundamentals/post/1278-coming-up-easier-signal-integrity-simulation-setup-with-ibis-70

Mike noted that it had also been the feature article in an email sent to anyone subscribed to the Signal Integrity Journal email list. Mike hoped this would help spread the word about IBIS 7.0.

Randy Wolff reported that an article from Micron was published in the IEEE Solid-State Circuits magazine on June 19, 2019. It is titled "Recent Evolution in the DRAM Interface: Mile-Markers Along Memory Lane", and it contains several paragraphs about IBIS-AMI modeling for DDR5.

The article is found at (an IEEE Xplore subscription is required):
https://ieeexplore.ieee.org/document/8741253

- Related standards
IEC 63055/IEEE 2401, JEITA "LPB"
Michael Mirmak reported no updates since the last meetings held at DAC in Las Vegas.

SUMMIT PLANNING AND STATUS
- IEEE SPI Summit
SPI was held in Chambéry, France on June 18-21, 2019. An IBIS Summit took place in the afternoon of June 21, 2019. Mentor and Zuken were sponsors.

Randy Wolff thanked the sponsors and thanked Michael Schäder for running the meeting and providing notes. Randy noted that Curtis Clark is working on drafting the minutes.

Michael had reported 18 attendees (17 signed in). There were five presentations including several from universities in Europe. Michael reported a good discussion of IBIS package modeling and S-parameter usage.

Bob Ross noted that there were 85 registered participants at SPI, so a good percentage had stayed for the IBIS Summit. Bob noted that he would send out thank you notes to presenters and others who helped with the event.

Bob noted that next year's SPI will be held in Cologne, Germany. We don't yet know the dates, but we expect to hold an IBIS Summit in conjunction with it. Mike LaBonte noted that SPI workshop chairs serve for two years. Mihai Telescu had just finished his second year, and Elmar Griese will be chair next year. Bob asked Steve Parker to add the 2020 SPI IBIS Summit to the bottom of the Unscheduled section of the Events page [AR].

- Asia Summits
Asian IBIS Summits are scheduled in Shanghai on November 1, 2019, Taipei on November 4, 2019, and Tokyo on November 8, 2019.

Bob Ross noted that JEITA handles the Tokyo meeting. The dates of all three summits are set, but other details are being worked out.

Steve Parker asked if the Asian IBIS Summits should be moved into the Scheduled section on the Events page [AR]. Bob said yes, the dates should be firm.

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 group continues to focus on ibischk 7.0. They have been working on the agreement document for source code purchasers.

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 p.m. PT. The group recently completed discussions on BIRD197.3, which was being introduced at this Open Forum meeting. The group has also been working on the improved C_comp modeling proposal.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak reported that the group meets at 8:00 a.m. PT on Wednesdays. The group has been focusing on the EMD proposal. The current topic is Pin Lists within the EMD proposal. Michael said the group had not yet decided whether the meeting scheduled for July 3, the day before the US 4th of July holiday, would be held.

Task group material can be found at:

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

EDITORIAL TASK GROUP

Michael Mirmak reported the task group remains suspended.

Task group material can be found at:

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

NEW ADMINISTRATIVE ISSUES

- Annual election of officers
Radek Biernacki reported that the election process had gone smoothly and according to IBIS

policies. A nomination period in the second half of May was followed by a voting period from June 3, 2019 until June 17, 2019. Of the 26 member organizations, 16 had cast ballots and 10 had not. Each of the new officers had received 16 votes. Radek had announced the results on June 18, 2019, at which point the newly elected officers took office.

Chair	Randy Wolff (Micron Technology)
Vice-Chair	Lance Wang (Zuken)
Secretary	Curtis Clark (ANSYS)
Treasurer	Bob Ross (Teraspeed Labs)
Librarian	Anders Ekholm (Ericsson)
Webmaster	Steven Parker (GLOBALFOUNDRIES)
Postmaster	Mike LaBonte (SiSoft)

Randy thanked Radek for serving as the returning officer and handling the election process.

BIRD197.3: NEW AMI RESERVED PARAMETERS DC_OFFSET AND NRZ_Threshold
Walter Katz reviewed the newly submitted BIRD. He noted that the basic change from BIRD197.2 was the introduction of the new NRZ_Threshold parameter. The EDA tool uses the value the model returns in this parameter to determine if the signal at the latch is high or low.

Walter noted that one could build a single-ended model where the waveform at the decision point is not nicely centered about zero. One could have a DC level shift introduced by the initial differential input, for example. So, the final signal might not be zero-centered but instead shifted to some other level. Rather than constrain the model maker, for example by forcing the output of Rx GetWave() to be shifted to be centered about zero, this new parameter was introduced. The parameter is also useful for statistical mode, where the IR based result is always centered about zero, because it can specify a non-ideal, non-zero threshold.

Arpad Muranyi noted that this BIRD had been discussed at length in the ATM task group. There had been discussion of adding a third parameter DC_for_Statistical as a way to match the output levels of waveforms produced by the statistical and time domain flows. The group had decided not to add that parameter to this BIRD and to introduce another BIRD later if necessary.

Walter noted that NRZ_Threshold is an Out parameter, and a value is output by AMI_Init() and AMI_GetWave(). The value output by AMI_Init() is for statistical processing. The value output by AMI_GetWave() is for time domain processing. The parameter may have different values for statistical and time domain.

Randy Wolff asked for any motions to schedule this BIRD for a vote. Walter said there was no rush, and he proposed waiting until the next Open Forum meeting. At that time, barring any comments or changes, Walter planned to move to schedule a vote for the subsequent meeting.

BIRD198: KEYWORD ADDITIONS FOR ON DIE PDN (POWER DISTRIBUTION NETWORK) MODELING
Randy Wolff asked if this BIRD should be tabled. Mike LaBonte said he had been keeping in touch with the authors, but it was unclear how long it would take them to respond to our feedback. Mike moved to table the BIRD. Bob Ross seconded. There were no objections.

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.

IBISCHK PARSER AND BUG STATUS
Bob Ross reported no new BUGs. Bob noted that the parser license agreement had been finalized by SAE ITC with a price of $3,000. Bob anticipated an initial drop of the parser code the following week, but this was not certain. The Quality task group expects to take some time checking the code drop before they release it. Bob noted that he had sent the parser developer a link to the Micron Interconnect Model Examples posted in the Interconnect task group archives. These should serve as good first test of the parser and the examples themselves.

Bob noted that he had already sent out parser license purchase requests to the organizations that had purchased a license for 6.1.5. In some cases the license agreement was going through legal review by purchasing organizations. Some organizations had already progressed to requesting an invoice. Bob noted that he had sent out a total of nine so far with two more to go.

Bob noted that he had worked with the parser developer to answer about twelve questions on details and interpretations. The most recent question had been, if we have an [Interconnect Model Group] containing an [Interconnect Model Set] containing [Interconnect Model]s, does the parser have to ensure that the terminal names in the [Interconnect Model], e.g., pin names, signal names, bus labels, pad names are defined at the top level [Component]? Bob had responded that the parser had to check this, otherwise we might have undefined terminals.

Randy Wolff asked if Bob expected it to take several weeks to fully check the new parser. Bob agreed. Bob noted that the parser developer adds test cases for new BIRDs and BUG fixes. Bob reviews those, and may modify them to further test the code, for example with negative tests. Mike LaBonte also runs a full regression suite to ensure older functionality was not broken.

Mike noted that he also builds the Red Hat executables for distribution, and a new webpage is created for the new version of ibischk, then the parser release is announced. Bob noted that source code purchasers typically can get the source code before the executables are released.

Randy asked if Open BUGs 202 – 205 will be addressed in this release. Bob said they were not part of the parser development contract and will probably be addressed in a 7.0.1 release.

NEW TECHNICAL ISSUES

None.

NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on July 19, 2019. The following teleconference meeting is tentatively scheduled for August 9, 2019.

Bob Ross moved to adjourn. Arpad Muranyi 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 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

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SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	May 17, 2019	June 7, 2019	June 21, 2019	June 28, 2019
ANSYS	User	Active	X	X	-	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Inactive	-	X	-	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	X	-
Ericsson	Producer	Inactive	-	-	-	-
GLOBALFOUNDRIES	Producer	Inactive	-	X	-	X
Google	User	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Active	-	X	X	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
IBM	Producer	Active	X	X	-	X
Intel Corp.	Producer	Active	X	X	-	X
Keysight Technologies	User	Active	X	X	-	X
Maxim Integrated	Producer	Inactive	-	-	-	-
Mentor, A Siemens Business	User	Active	X	X	-	X
Micron Technology	Producer	Active	X	X	-	X
NXP	Producer	Inactive	-	-	-	-
SiSoft	User	Active	X	X	-	X
SPISim	User	Inactive	X	X	-	-
Synopsys	User	Inactive	-	X	-	-
Teraspeed Labs	General Interest	Active	X	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

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.