

**IBIS Open Forum Minutes**

Meeting Date: **December 13, 2019**

Meeting Location: **Teleconference**

**VOTING MEMBERS AND 2019 PARTICIPANTS**

ANSYS Curtis Clark\*, Marko Marin, Miyo Kawata

Toru Watanabe, Akira Ohta, Bailing Zhang, Xi Wu

Xin Sun, Jack Wu, Gregory Liao, Frances Peng

Joan Chen, Ruby Wu

Applied Simulation Technology (Fred Balistreri)

Broadcom (Yunong Gan)

Cadence Design Systems [Brad Brim], Ambrish Varma, Ken Willis

Yingxin Sun, Zhen Mu, Jinsong Hu, Skipper Liang

Zuli Qin, Haisan Wang, Hui Wang, Yaofei Wang

Yitong Wen, Binyue (Kathy) Yang, Zhangmin Zhong

George Zhu, Eric Lu, Frank Pai, Jessica Yeh

Sylvia Kao, Nemo Hsu, Tric Chiang, Morihiro Nakazato

Cisco Systems Hannah Bian, Guobing (Robin) Han, Wei Li

Zongyuan Liu, Sijie Mao, Jun (Gene) Zhang

Dassault Systemes (CST) Stefan Paret, Longfei Bai

Ericsson Anders Ekholm, Anders Vennergrund, Felix Mbairi

Hui Zhou, Inmyung Song, Mattias Lundqvist

Wenyan Xie, Zilwan Mahmod, Nan Hou, Amy Zhang

Google Zhiping Yang, Songping Wu

Huawei Technologies Antonio Ciccomancini, Haiping Cao, Peng Huang

Hongxing Jiang, Chunhai Li, Shengli (Victory) Wang

Zhengrong Xu, Hang (Paul) Yan, Chen (Jeff) Yu

Zhengyi Zhu, Tianqi Fang

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, Bruce Qin, Kai Yuan, Denis Chen

Neo Hsiao

Keysight Technologies Radek Biernacki\*, Hee-Soo Lee, Stephen Slater

Jian Yang, Ming Yan, Pegah Alavi, Jiarui Wu

Jiajie Zhao, Nash Tu, Toshinori Kaeura

Satoshi Nakamizo

Marvell (was GLOBALFOUNDRIES) Steve Parker\*

Marvell (past non-voting status) Johann Nittmann, Jianping Kong, Banglong Qian

Songjie (Jacky) Wang

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

Kunimoto Mashino

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Zack Yang, Cheng Zhang

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SiSoft (MathWorks) Mike LaBonte\*, Graham Kus, Walter Katz\*

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ZTE Corporation Shunlin Zhu, Fengling Gao, Yuling Li, Dongdong Ye

Zuken Michael Schäder, Crab Chen, Yoshio Nakajima

Deva Yang, Kevin Yang, Kiyohisa Hasegawa

Kensuke Yoshijima, Takayuki Shiratori

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Amkor Technology Ian Yu

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John Baprawski, Inc. John Baprawski

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Hamburg University of Technology Til Hillebrecht

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Kingston Technology Hardy Chang, CF Chen, Mars Ho

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Ryuki Kubohara, Masato Kanie

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Lenovo Aje Chang, Alan Sun, John Liu

Macnica Hidemichi Tanaka

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Raphael Huang, Thomas Huang, George Lee

Tom Lee, Benson Peng

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New H3C Group Zixiao Yang, Muwang Ye

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Nissan Motor Corporation Hidenari Nakashima

Novatek Josh Wu

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Richie Lu, Chihwei (Jason) Tsai

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Oki Electric Industry Co. Atsushi Kitai

Olympus Digital System Design Ken Saito

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OmniVision Sirius Tsang, Baohua Tu, Wenhui Shang, Bibo Ping

Wei Li, Xuanjiang Shen

Panasonic Corporation Kenkichi Hirano, Atsushi Nakano

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Quanta Computer Joseph Huang, Kyle Lin

Raytheon Joseph Aday

Renesas Genichi Tanaka

Renesas Electronics Corporation Kazuyuki Sakata, Genichi Tanaka

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Rohm Co. Nobuya Sumiyoshi

Ryosan Co. Takahiro Sato, Kouji Tsutsui

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SALE Yang Weng

SAXA Takayuki Ito

Seagate Alex Tain

Shinko Electric Industries Co. Manabu Nakamura

Shinewave (Xiangwei International) Nike Yang

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Silvaco Japan Co. Yoshiharu Furui

Socionext Megumi Ono, Motoaki Matsumura, Yuji Nakagawa

Hajime Ohmi, Ide Yutaka, Yumiko Sugaya

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Zhaoxin (Shanghai Zhaoxin Zhen (Caffrey) Fu, Chuanyu (Liam) Li

Semiconductor)

Zuiki Kon Kou

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

January 10, 2020 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.

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**INTRODUCTIONS AND MEETING QUORUM**

Curtis Clark declared that a quorum was 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 November 1, 2019 IBIS Asia Summit in Shanghai, the November 4, 2019 IBIS Asia Summit in Taipei, and the November 8, 2019 IBIS Asia Summit in Tokyo. Lance Wang moved to approve the minutes. Mike LaBonte seconded the motion. There were no objections.

Randy Wolff called for comments on the minutes of the November 22, 2019 IBIS Open Forum teleconference. Mike LaBonte moved to approve the minutes. Michael Mirmak seconded the motion. There were no objections.

Randy reviewed ARs from the previous meeting.

1. Randy Wolff to find out what organizations were involved in creating JEP30 and who would make use of it [AR].

Randy noted that he had found a contact at Micron with more information, but that contact had just returned from vacation. Randy said he expected to have more information at the next meeting. He said this was in progress and should remain an active [AR].

1. Michael Mirmak to check on the cost of making IEEE 2401 available via the IEEE Get Program [AR].

Michael noted that Ethernet (IEEE 802), for example, is available via the IEEE Get Program. He noted that getting anything into the IEEE Get program relies on some organization covering the cost. He noted that depending on whether it’s a single document or a family of standards the cost is typically around $40,000 to $50,000. Randy noted that it would be helpful for us to have access to IEEE 2401, but that cost is probably prohibitive for us. Michael noted that IEEE 2401 is currently at draft 2. There are currently no plans to get it into the IEEE Get Program, though this could change later.

1. Steve Parker to add the Asia Summits for 2020 to the Upcoming Events page’s Unscheduled Recurring IBIS meetings section [AR].  
   Steve reported that this had been done. He also noted that he had gotten the 2019   
   Asia Summits booklets from Bob Ross and posted them to the Past Summits pages.
2. Steve Parker to add an announcement of the new ibischk7 release at the top of the home page [AR].  
   Steve reported that this had been done. He also noted that he had added an announcement for the DesignCon 2020 Summit to the home page.
3. Randy Wolff to follow up with Kevin Li of Synopsys about interest in leading an ATM-like task group in Asia [AR].  
   Randy reported that he had exchanged emails with Kevin, and Kevin has some interest in possibly leading a group like that. Mike noted that we had tried to form a group like this before. We had formed a China regional forum in 2016 based on requests from the region, but it had not gone anywhere. He suggested that perhaps we could reuse the infrastructure, mailing lists, etc., we had set up for that. Bob noted that having Synopsys (Kevin Li) take a leadership role might be helpful. Two of the companies in the original China regional forum were competitors and couldn’t even email each other, which may have stalled the development. Randy noted that Kevin had expressed concern that with multiple countries in Asia the meetings might have to be in English, which could present a problem. Lance noted that probably only Taiwan and China could be combined because of the language issues. Randy noted that he planned further discussions with the IBIS Board and Task Group Chairs to outline how this group might be organized and led. [AR]
4. Randy Wolff to send thank you notes to the Asia IBIS Summit presentation authors and speakers [AR].  
   Randy reported that this had been done.

**ANNOUNCEMENTS**, **CALL FOR ADDITIONAL AGENDA ITEMS**

None.

**MEMBERSHIP STATUS AND TREASURER'S REPORT**

Bob Ross reported that we have 26 members. We have $22,231 cash flow for 2019 and a $24,981 adjusted balance for 2019. These numbers reflect additional sponsorship income and the payment of $9,425 to Randy Wolff for reimbursement for Asian IBIS Summit credit card expenses. Overall the Asian IBIS Summits showed a net profit of $2,477.

We have nine fully signed agreements, and these organizations will receive the parser code:

ANSYS

Cadence Design Systems

Dassault Systemes

Keysight Technologies

Intel

Julin (Shanghai) Microelectronics

Mentor, A Siemens Business

Synopsys

Zuken

We expect one or two more parser license payments before the end of 2019, and at least one pushed out until 2020. Bob noted that he had asked Phyllis Gross to send out membership renewal notices for 2020. He asked members to follow up internally as soon as the invoice is received. He noted that he sees more companies using an accounting dictated 45 to 60 day payment process.

**WEBSITE ADMINISTRATION**

Steve Parker noted that the website was up to date with respect to BIRDs, minutes, summit information, etc. He had posted additional information for the Asian Summits and updated sponsorship information for the upcoming DesignCon 2020 Summit.

Steve noted that he had asked corporate for approval to add the Marvell logo to the IBIS home page. Bob Ross noted that Marvell had been a member in the past. He suggested Steve might simply add “Marvell” in text to the home page, as we had done for other member organizations until they had approved use of their logos. Curtis Clark asked if the meeting minutes should continue to preserve the separation of Marvell, formerly GLOBALFOUNDARIES, the member organization, and Marvell the non-voting participant organization. Steve thought they could be merged. Bob asked that we preserve the separation until the new 2020 membership year. Curtis said he could preserve the separation for this meeting’s minutes and merge them next time. Steve said this was fine with him.

**MAILING LIST ADMINISTRATION**

Mike LaBonte noted that mailing lists were operating normally. He had reviewed the current subscriber lists, and we have 358 addresses subscribed. He noted that there are probably slightly fewer individuals, as some people might subscribe with multiple addresses. Mike noted that there are 90 addresses that are only subscribed to task groups and not to the main ibis and ibis-users lists. Mike noted that the total number of subscribers had remained fairly constant in recent years. The total of 358 represented a drop of 4 in the subscriber count over the past 2 years.

**LIBRARY UPDATE**

No update.

**INTERNATIONAL/EXTERNAL ACTIVITIES**

- Conferences

Bob Ross and Randy Wolff noted that the website for the 24th IEEE Workshop on Signal and Power Integrity (SPI 2020) is now active. Randy noted that the call for papers had gone out.

<https://spi2020.uni-siegen.de/>

- Press Update

Randy noted a new DesignCon 2020 press release that included the comment Informa Markets (formerly UBM) had solicited from him regarding the value of DesignCon.

<http://www.globenewswire.com/news-release/2019/10/31/1938949/0/en/DesignCon-Presents-2020-Conference-Programming-Exploring-the-Evolving-Electronics-Design-Landscape-for-its-25th-Edition.html>

- Related standards

IEC 63055/IEEE 2401, JEITA “LPB”

Michael Mirmak noted that he had nothing new to report. He said that in the new year IEEE 2401 and several others would go in front of the highest levels of the IEEE Standards Board for approval, and he could report back once he has information on scheduled dates or decisions.

**SUMMIT PLANNING AND STATUS**

- Asia Summits 2019 Review

Randy Wolff noted that we had reviewed the summits at the last teleconference, but that he had not discussed the vendor-specific presentation portions because Lance Wang had chaired them. Lance noted that this was the first year we had introduced the vendor-specific “product promotion” sessions and that these were only held in Shanghai and Taipei. He noted that Cadence and ANSYS had participated at both, and Keysight had participated in Shanghai. Lance noted that the primary goals were increasing the sponsorship revenue to offset summit costs and improving attendance in Asia. Lance said that based on attendance the product promotion presentations appear to have been a success. He noted that approximately 80 percent of summit participants stayed for the presentations, and there were robust question and answer sessions. Lance said we would likely continue the program next year and work even more on organizing the vendor tables to ensure they promote the product promotion sessions and the IBIS summit itself.

Randy noted that in Taipei there had been some discussion about how to get attendees to come in from other cities. Lance noted that the Taipei summit is typically at the Sherwood Hotel in downtown Taipei City. He said that many companies are located in Shinzu, about a 45 minute drive from Taipei. Bob Ross noted that we had once held a summit in Shinzu, but attendance had been low. Lance agreed and noted that semiconductor vendors in Shinzu typically will travel to Taipei, but systems vendors located in Taipei had not traveled to Shinzu. Lance noted that one option that had been suggested was to provide a bus from Shinzu to Taipei, but we would have to keep an eye on summit sponsorship money to see if we could fit that into the budget.

Bob noted that some sponsors in Taipei had chosen not to give product promotion presentations this year, but next year they may do so. Bob and Randy thanked Lance for his efforts organizing, chairing, and running the sessions.

- DesignCon 2020 Summit (January 31, 2020)

Randy noted that the summit is held on Friday, the day after DesignCon ends. Randy said that a new room has been arranged. We will now be in Ballroom G, which is a bigger room than the 209-210 combination we have used in the past. There should be seating for at least 90 people in the classroom setting, and we will have tables in the back and refreshments in the hall outside. Currently the official sponsors include the IBIS Open Forum, Cadence, Keysight, and Synopsys. Randy noted that we will send out 3 emails as part of our agreement with Informa Markets, and the first one had gone out already.

Bob noted that we are now asking for presentations to be submitted for the summit. Bob noted that we already have one presentation from Marvell and Cadence, one from JEITA on IBIS v7.0 collaboration with IEEE 2401, and one expected from JEITA on BIRD198. Bob asked that attendees let Lance and Bob know they plan to attend.

- IEEE SPI Summit 2020

Bob noted that we will plan for a formal vote on this summit early in 2020. Bob expects to formally move to schedule the vote at the meeting on January 10th. He will move to vote on holding the summit on May 20th at a cost not to exceed $2,500. He noted that the cost includes a 1,500 Euro fee plus refreshments on top of what SPI will be providing. Bob noted that once the summit is formally approved he will ask for the SPI2020 banner to be added to the Upcoming Events page as is done for DesignCon.

**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. Recently discussions have been focused on BUG207 and BUG208.

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 was not able to join the meeting. Randy Wolff reported that the group meets on Tuesdays at 12:00 p.m. PT. The group had recently been discussing a variety of topics including editorial changes to the DC\_Offset BIRD, which Bob Ross noted had recently been submitted to the Open Forum as BIRD197.6 (see below), the review of a new response from the authors of BIRD198, and Walter Katz’s proposal for enhancing the AMI back channel interface (BCI) to work in statistical mode. Walter noted that he hopes the back channel proposal will be submitted and have an official BIRD number by DesignCon. He noted that ATM is also working on a DDR5 DQ Write protocol for back channel. We have one controller vendor and one memory vendor involved and would welcome input from more.

Randy noted that the meeting on December 17th will be the last ATM meeting of 2019.

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. Michael noted that Walter Katz has been serving as chief editor for the EMD proposal, which is now on draft 27. He noted that there are a few definitional issues to be resolved, e.g., terminals vs. pins, and the basic definitions of “connection” and “component” are being reviewed and may affect the rest of IBIS.

Michael noted that the meeting on December 18th will be the last Interconnect meeting of 2019, and they have an informal goal of having the EMD BIRD submitted by DesignCon.

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**

-None.

**BIRD197.6: NEW AMI RESERVED PARAMETERS DC\_OFFSET**

Walter Katz summarized the newly submitted version. He noted that ATM had gotten agreement from controller, memory, and EDA vendors on how the EDA tool generates the value as an input and what the EDA tool can do with the value when it plots the resulting outputs of the AMI\_Init and AMI\_GetWave functions. Bob Ross noted that this version had removed a sentence originally proposed by Michael Mirmak, and he asked for confirmation that Michael no longer wanted this sentence. Michael confirmed this was correct. Bob noted one minor editorial issue, on item 2c the units (V) were missing. It should say “0.5 V”. Walter moved to schedule a vote on this BIRD, with the change noted by Bob, at the next meeting on January 10th, 2020. Michael seconded. There were no objections. Randy Wolff to send an email to the Open Forum announcing the vote [AR].

**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.

**BIRD198: KEYWORD ADDITIONS FOR ON DIE PDN (POWER DISTRIBUTION NETWORK) MODELING**

Discussion was tabled. Randy Wolff that a new response from the authors is being reviewed in the ATM task group.

**IBISCHK PARSER AND BUG STATUS**

Bob Ross noted that there are now two open bugs:

1. BUG207 – submitted by Randy Wolff and reviewed briefly at an earlier meeting.
2. BUG208 – submitted by Arpad Muranyi and involving a hang in the Interconnect Model parsing.

BUG208 now has an officially submitted test case, which is a simplified version of the example provided by Arpad. Bob noted that the test case hangs ibischk 7.0, and it is related to Interconnect Model syntax (BIRD189). If you have two Interconnect Models in an Interconnect Model Set, the parser hangs. Bob noted that Mike LaBonte had diagnosed the issue as a pointer that wasn’t being incremented and noted a fix. Mike said that we could have considered its Severity “Fatal”, but he found that Fatal had never been used before, though it probably could have been. Bob moved to classify BUG208 as Severe, High Priority, Open, and fix at next release. Walter Katz seconded. There were no objections.

Bob noted that we now have 9 parser license contracts for ibischk7. He noted that he had privately issued the BUG208 fix to source code owners already, and that he would like to immediately issue a 7.0.1 release to fix only BUG208.

BUG207 is still in debate in the Quality task group, and Bob noted that they still haven’t come to agreement on whether it’s a BUG and should be addressed. He noted that it relates to a change in the checking of Submodels. He noted that current behavior of the parser is that only the main Model without the Submodel is considered when the parser checks for endpoint agreement of the [Ramp] specification and the static I/V tables. He said that Randy’s BUG207 proposed a special case for which a certain type of Submodel would be included when that check is performed. Bob said he was not yet ready to classify it. Randy agreed that more discussion is needed and noted that he doesn’t want to break existing models. Randy noted that they might even wait until DesignCon and provide more information there. Bob said this was a possible topic for one of his DesignCon presentations and that he was still leaning toward not considering it a bug.

**NEW TECHNICAL ISSUES**

None.

**NEXT MEETING**

The next IBIS Open Forum teleconference meeting will be held on January 10, 2020. The following teleconference meeting is tentatively scheduled for February 21, 2020. Note that the DesignCon 2020 IBIS Summit will be held on January 31, 2020.

Randy Wolff wished everyone Happy Holidays and thanked everyone for their work on IBIS this year.

Mike LaBonte moved to adjourn. Curtis Clark 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.

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* To subscribe to one of the task group email lists: [ibis-macro@freelists.org](mailto:ibis-macro@freelists.org), [ibis-interconn@freelists.org](mailto:ibis-interconn@freelists.org), or [ibis-quality@freelists.org](mailto: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](http://www.ibis.org/%20bugs/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** | **November 4, 2019** | **November 8, 2019** | **November 22, 2019** | **December 23, 2019** |
| ANSYS | User | Active | X | X | X | X |
| Applied Simulation Technology | User | Inactive | - | - | - | - |
| Broadcom Ltd. | Producer | Inactive | - | - | - | - |
| Cadence Design Systems | User | Active | X | X | X | - |
| Cisco Systems | User | Inactive | - | - | - | - |
| Dassault Systemes | User | Inactive | - | - | - | - |
| Ericsson | Producer | Inactive | X | X | - | - |
| Google | User | Inactive | - | - | - | - |
| Huawei Technologies | Producer | Inactive | - | - | - | - |
| Infineon Technologies AG | Producer | Inactive | - | - | X | - |
| Instituto de Telecomunicações | User | Inactive | - | - | - | - |
| IBM | Producer | Inactive | - | - | X | - |
| Intel Corp. | Producer | Active | X | - | X | X |
| Keysight Technologies | User | Active | X | X | X | X |
| Marvell (GLOBALFOUNDRIES) | Producer | Active | - | - | X | X |
| Maxim Integrated | Producer | Inactive | - | - | - | - |
| Mentor, A Siemens Business | User | Active | - | X | X | - |
| Micron Technology | Producer | Active | X | X | X | X |
| NXP | Producer | Inactive | - | - | - | - |
| SiSoft | User | Active | - | - | X | X |
| SPISim | User | Active | - | - | X | X |
| Synopsys | User | Active | - | X | X | X |
| Teraspeed Labs | General Interest | Active | - | - | 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.