

**IBIS Open Forum Minutes**

Meeting Date: **December 15, 2017**

Meeting Location: **Teleconference**

**VOTING MEMBERS AND 2017 PARTICIPANTS**

ANSYS Curtis Clark\*, Toru Watanabe, Baolong Li, Benson Wei

 Miyo Kawata, Toru Watanabe

Applied Simulation Technology (Fred Balistreri)

Broadcom [Bob Miller], (Cathy Liu)

Cadence Design Systems Brad Brim, Sivaram Chillarige, Debabrata Das

 Ambrish Varma, Kumar Keshavan, Ken Willis

 Brad Griffin, Aileen Chen, Lanbing Chen

 Guoyu Cui, Wei Dai, Zhiyu Guo, Henry He

 Jinsong Hu, Liang Jiang, Skipper Liang

 Ping Liu, Feng Miao, Zuli Qin, Haisan Wang

 Hui Wang, Yitong Wen, Clark Wu, Janie Wu

 Susan Wu, Benny Yan, Haidong Zhang

 Alex Zhao, Zhangmin Zhong, Kent Ho, Angel Lai

 Muse Shao, Candy Yu, Morihiro Nakazato

Cisco Systems Lei (Jason) Liu, Cassie (Xu) Yan

CST Stefan Paret, Matthias Troescher, Burkhard Doliwa

 Danilo Di Febo, Alexander Melkozerov

Ericsson Zilwan Mahmod, Guohua Wang, Amy X Zhang

GLOBALFOUNDRIES Steve Parker

Huawei Technologies Haiping Cao, Wei (Richard) Gu, Zhenxing Hu

 Peng Huang, Hongxing Jiang, Longfang Lv

 Luya Ma, Guangjiang Wang, Huichao Weng

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

 Xiaojun (Steve) Zhou, Zhengyi Zhu, Huajun Chen

 Shengli Wang, Zen Wei

 Huawei Technologies (Hisilicon) Fangxu Yang

IBM Luis Armenta, Adge Hawes, Greg Edlund

Infineon Technologies AG (Christian Sporrer)

Intel Corporation Michael Mirmak\*, Hsinho Wu, Eddie Frie

 Gianni Signorini, Barry Grquinovic

 Masashi Shimanouchi, Denis Chen, Jimmy Hsu

 Cucumber Lin, Zoe Li, Thonas (Yiren) Su

IO Methodology Lance Wang

Keysight Technologies Radek Biernacki, Pegah Alavi, Fangyi Rao

 Stephen Slater, Jian Yang, Heidi Barnes

 Kuen Yew Lam, Mitsuharu Umekawa, T. Kageura

Maxim Integrated Joe Engert, Don Greer, Yan Liang, Hock Seow

Mentor, A Siemens Business Arpad Muranyi\*, Nitin Bhagwath, Praveen Anmula

(formerly Mentor Graphics) Fadi Deek, Raj Raghuram, Dmitry Smirnov

 Bruce Yuan, Carlo Bleu, Chao Jiang, David Xu

Micron Technology Randy Wolff, Justin Butterfield\*, Jeff Shiba, Harry Shin

 Micron Memory Japan Masayuki Honda, Tadaaki Yoshimura, Toshio Oki

NXP (John Burnett)

Qualcomm Tim Michalka, Kevin Roselle, Irwin (Zhilong) Xue

Raytheon Joseph Aday

SiSoft Mike LaBonte\*, Walter Katz\*, Todd Westerhoff

 Steve Silva

Synopsys Kevin Li\*, Ted Mido\*, John Ellis, Scott Wedge

 Wonsae Sim, Xuefeng Chen, Jinghua Huang

 Yijiang Huang, Deng Shi, Yuyang Wang

Teraspeed Labs Bob Ross\*

Xilinx Masao Nakane

ZTE Corporation Rongxing Ban, Xinjian Chen, Fengling Gao

 Tao Guo, Lili Wei, Yangye Yu, Shunlin Zhu

Zuken Ralf Bruening, Michael Schaeder, Alfonso Gambuzza

 Kiyohisa Hasegawa, Takayuki Shiratori

**OTHER PARTICIPANTS IN 2017**

A&D Print Engineering Co. Y. Yoshida

Abeism Corporation Nobuyuki Kiyota

Accton Raul Lozano

ADLINK Technology Alvis Hsu

AMD Japan Tadashi Arai

Amphenol Fred Shen, Holly Wang

Apollo Giken Co. Satoshi Endo

ASR Microelectronics Lili Dia, Shulong Wu

ASRock Rack Eric Chien

ASUS Nick Huang, Bin-chyi Tseng, Andrew Huang

Aurora System Murong Lu, Jiaxin Sun

Avant Technology Jyam Huang, Chloe Yang

Avnet K. Ogasawara, M. Hinosugi

BasiCAE Kiki Li, Darcy Liu, July Tao, Lisa Wu

Brite Semiconductor Haonan Wang

Calsonic Kansei Corp. K. Hosoya

Canon Syoji Matsumoto, H. Isono

Casio Computer Co. Ikuo Imada

Celestica Wilson Chen, Sophia Feng, Lurker Li

 Weiqing Liiu, Vincent Wen

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eASIC David Banas

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Flextronics Renjun Sun

Foxconn Electronics Gino (Chunjen) Chen, Joe (Chienhusn) Chen

 Alex Tang

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Fujitsu Interconnect Technologies Masaki Kirinaka, Akiko Tsukada

Fujitsu Kyushu System Services K. Nabae

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Hamburg University of Technology Torsten Revschel, Torsen Wendt

Hewlett Packard Enterprise Passor Ho, Corey Huang, Hellen Lo

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JEITA R. Miyagawa, Hirohisa Nakamura

John Baprawski, Inc. John Baprawski

Jujube T. Hosaka

JVC Kenwood Corp. Y. Ojima, A. Kadowaki, M. Furuya

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Kyoden Co. T. Takauji

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Leading Edge Pietro Vergine

Lenovo Group Shaogao Zheng, Paul Chu, John Lin, Alan Sun

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Lite-On Technology Sam (Dongru) Lyu

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Missouri Science and Technology Giorgi Maghlakelidze

 EMC Lab

Mitsubishi Electric Corp. Yusuke Suzuki

Modech T. Ochiai

Mostec Nelly Li, Clark Zhang

Murata Manufacturing Co. K. Mukuaiyama, Y. Murukami

Nanya Technology Corp. Chingfeng Chen, Chiwei Chen, Andy (Weishen) Chih

 Minlun Lan, George Lee, Allen Ye

NEC Platforms Y. Onodera

Neophotonics Semiconductor GK S. Moribayashi

Novatek Jerrcik Cheng, Vincent Lin

Oki Electric Industry Co. Atsushi Kitai

Panasonic Corp. N. Manabe

Panasonic Industrial Devices, Kazuki Wakabayashi

 Systems and Technology Co.

Pegatron Corp. Melissa Huang, James Lee

Pioneer Corp. K. Tochitani

Politecnico di Torino Claudio Siviero, Stefano Grivet-Talocia, Igor Stievano

PWB Corp. T. Ohisa

Quanta Computer Eriksson Chuang, Aaron Lee, Scott Lee, Jerry Syue

Renesas Electronics Corp. M. Suzuki, N. Yokoshima, Kazunori Yamada

 M. Hanagiri, T. Hayashi

Ricoh Company Yasuhiro Akita, M. Goto, Kazuki Murata

Ricoh Industry Co. Kohji Kurose, Toshihiko Makino

Rise Corp. S. Yanagita

Rockchip Junming Shi

Rohm Co. Noboru Takizawa

SAE-ITC (Thomas Munns), Jose Godoy

SAIC Motor Corp. Weng Yang

Samsung Jung Hwan Choi

Shanghai Fudan Microelectronics Zhenghui Chen, Liu Lu Fang, Xin Li, Yuezhi Liu

 Group Xiao Lei Luo, Canghai Tang

Shinewave Nike Yang

Signal Metrics Ron Olisar

SII Semiconductor Corp. M. Murata

SMICS Sheral (Xuejiao) Qi

Socionext Shigeru Nishio, Watari Tanaka, Yumiko Sugaya

 Shizue Kato, Yu Kamata, H. Ohmi, F. Kawafuji

 Y. Sumimoto, M. Tomita, Megumi Usui

Sohwa & Sophia Technologies Tomoki Yamada

Sony Global Manufacturing & Taichi Hirano, A. Muto, T. Yuasa, T. Mizoroki

 Operations Corp.

Sony LSI Design Satoshi Tago, Toru Fujii

Sony Semiconductor Solutions K. Amano

SPISim (Peace Giant Corp.) Wei-hsing Huang, Walter Huang

Spreadtrum Communications Junyong Deng, Ganyue Wang, Shiqing Si

Stanford University Tom Lee

STMicroelectronics Fabio Brina, Olivier Bayet

Tatung Technology Barry Chen, Daniel Chen

Teledyne Lecroy Facun Li, Yifeng Wu

TFF Corp. Katshuhiko Suzuki

Thine Electronics S. Ikeda, T. Sada

TopBrain Ye Li

Toshiba Yasuki Torigoshi, Yoshinori Fukuba

Toshiba Development & N. Kasai

 Engineering Corp.

Toshiba Electronic Devices & A. Tomishima, Yasunobu Umemoto, T. Tsujimura

 Storage Corp.

Toshiba Memory Corp. Masato Kanie

Toshiba Memory Systems Co. E. Kozuka, J. Shibasaki

Toshiba Microelectronics Corp. Jyunya Masumi

TSG Co. S. Mitsuyama

U-Creative Amber Wu

Université Blaise Pascal Mohamed Toure

Université de Bretagne Occidentale Mihai Telescu

VIA Labs Shengyuan Lee

VIA Technologies Terence Hsieh, Justin Hsu

Winbond Yumin Hou, Albert Lee

Xpeedic Tuhui Gui

Yamaha Corp. H. Kai

Yi Chuan Technology Wei Ming Lu

Zhaoxin Liam Li, Eddrick Wang

Zhejiang Uniview Technologies Busen Cai, Jilun Fang

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 5, 2018 624 227 121 IBISfriday11

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

 <http://tinyurl.com/y7yt7buz>

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**

Mike LaBonte declared that a quorum was reached and the meeting could begin.

**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 December 1, 2017 IBIS Open Forum teleconference. Curtis Clark moved to approve the minutes. Bob Ross seconded the motion. There were no objections.

Mike reviewed ARs from the previous meeting.

1. Mike to add the EPEPS minutes link to the web page [AR].

Mike reported this as done.

1. Mike to find out if JEITA LPB authors will attend DesignCon 2018 [AR].

Mike reported that we do not have the authors’ names, but one member will be joining us at DesignCon.

1. Mike to invite Arpad Muranyi to the Quality task group meeting to help review his specific bug reports [AR].

Mike reported this as done, and he noted that Arpad did attend to discuss the four new bugs he has submitted.

Mike called for comments on the minutes of the November 13, 2017 Asian IBIS Summit in Shanghai. Bob noted previously that Yangye Yu’s name was misspelled in one section of the minutes as “Yanye”. Bob moved to approve the minutes with the noted change. Michael Mirmak seconded the motion. There were no objections.

Mike called for comments on the minutes of the November 15, 2017 Asian IBIS Summit in Taipei. Walter Katz moved to approve the minutes with the noted change. Bob seconded the motion. There were no objections.

Mike called for comments on the minutes of the November 17, 2017 Asian IBIS Summit in Tokyo. Michael moved to approve the minutes with the noted change. Bob seconded the motion. There were no objections.

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

None.

**MEMBERSHIP STATUS AND TREASURER'S REPORT**

Bob Ross reported that we are at 26 members. Our account balance is at $19,489 for 2017. Actual cash flow of $17,739 has been collected in 2017. Bob commented that there are about $2300 in miscellaneous charges from SAE to be paid. Mike LaBonte asked if this is about the same as past years. Bob replied that last year this was about $2100. Bob noted that SAE is meeting on what to charge IBIS, and he hopes for IBIS to be a part of this discussion. Bob noted that it looks like we have profit for 2017, but we have a lot of upcoming expense for parser development.

**WEBSITE ADMINISTRATION**

Mike LaBonte reported that there are no significant changes to the website other than his AR from last time. Mike commented that he has a request from Arpad Muranyi to reorder the BIRD189.5 drafts on the Interconnect Task Group page.

**MAILING LIST ADMINISTRATION**

Curtis Clark reported that there were some transient failures with one company’s server, but this appears to be resolved.

**LIBRARY UPDATE**

No update.

**INTERNATIONAL/EXTERNAL ACTIVITIES**

- Conferences

None.

- Press Update

None.

- Related standards

Michael Mirmak reported that DASC met last week. DASC is holding a vote on a PAR working group to restart work on revising IEEE 2401 which is the packaging standard. Michael indicated that IBIS would like to be involved in the effort of updating the IEEE 2401 standard. Michael also noted that the IEEE 1735 standard on encryption is being opened for discussion. He has asked the DASC group if these changes to the encryption will affect the analog and AMS versions of Verilog and VHDL, but he has not yet received a response. Arpad Muranyi noted that there are security flaws with the IEEE 1735 encryption. Michael agreed and stated that there are security improvements being considered. Mike LaBonte asked if there is anything in IBIS that would need change regarding these standards changes. Michael stated that an assessment would be needed. Walter Katz thought that IBIS would not need to worry about how the encryption is handled inside the tool. Michael noted that there will be a DASC meeting at DVCon at the end of the February 2018 where new issues can be taken up.

**SUMMIT PLANNING AND STATUS**

- DesignCon 2018

DesignCon will be held in Santa Clara, CA on January 30 through February 1, 2018. An IBIS Summit will be held on Friday, February 2, 2018 from 8:00 a.m. to 5:00 p.m. Mike LaBonte noted that there are some logistics that need to be worked out still. UBM is providing the room and AV equipment, and in return, we are running some promotional activities including e-mail advertisements and a banner on the IBIS website. Mike commented that we have room 209 which is the same room as last year. Mike encouraged everyone who is attending to register and to send paper submissions in. He stated that we are still looking for sponsors. Bob Ross noted Keysight is sponsoring and others are considering sponsoring.

- European IBIS Summit at SPI 2018

SPI 2018 will be held in Brest, France on May 22 through May 25, 2018. Bob noted the costs to IBIS should not exceed $2,500 and that sponsorship usually recovers most of the cost.

Bob moved to vote to hold an IBIS Summit on May 25, 2018 at SPI with costs not to exceed $2,500. Michael Mirmak seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

Cadence – yes (by email)

Infineon – yes (by email)

Intel – yes

Mentor – yes

Micron – yes

SiSoft - yes

Synopsys – yes

Teraspeed Labs – yes

ZTE – yes (by email)

Zuken – yes (by email)

The roll call vote concluded with a vote tally of Yes – 11, No – 0, Abstain – 0. The vote passed.

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. Mike noted that some new bugs have been reported. Arpad Muranyi has joined the meeting to discuss these new bugs. The group is also doing some initial work on an IBIS 7.0 parser document that will help development on the parser begin soon after IBIS 7.0 is approved.

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. The group has been helping the Interconnect task group to finish BIRD189.5.

Task group material can be found at:

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

**INTERCONNECT TASK GROUP**

Michael Mirmak reported that the group is meeting at 8:00 a.m. PT on Wednesdays. He noted that most of the technical issues have been resolved for BIRD189.5, but they are still discussing aggressor treatment as the main remaining issue. Once this issue has been resolved, the group will do an editorial pass before submitting the BIRD.

Task group material can be found at:

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

**EDITORIAL TASK GROUP**

Michael Mirmak reported that this group remains suspended. Should there be any official document to review such as IBIS 7.0, the task group will resume meetings.

Task group material can be found at:

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

**NEW ADMINISTRATIVE ISSUES**

Bob Ross moved to vote to set dues for the full IBIS Open Forum membership at $900 for 2018. Michael Mirmak seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

Cadence – yes (by email)

Infineon – yes (by email)

Intel – yes

Mentor – yes

Micron – yes

SiSoft – yes

Synopsys – yes

Teraspeed Labs – yes

Zuken – yes (by email)

The roll call vote concluded with a vote tally of Yes – 10, No – 0, Abstain – 0. The vote passed.

Bob noted we needed to officially set dues for SAE accounting. Bob reminded everyone to get the paper work started for dues payment. Mike LaBonte asked if it mattered if payment is received before the start of 2018. Bob said it was fine to send it in early.

**BIRD165.1: PARAMETER PASSING IMPROVEMENTS FOR [EXTERNAL CIRCUIT]S**

Arpad Muranyi asked if there were any questions before holding a vote. No questions were raised.

Arpad moved to schedule a vote on BIRD165.1. Bob Ross seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

Intel – yes

Mentor – yes

Micron – yes

SiSoft – yes

Synopsys – yes

Teraspeed Labs – yes

ZTE – yes (by email)

The roll call vote concluded with a vote tally of Yes – 8, No – 0, Abstain – 0. The vote passed.

Mike LaBonte will add the approval date to the website for the BIRD [AR].

**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.

**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.

**BIRD166.4: RESOLVING PROBLEMS WITH REDRIVER INIT FLOW**

Discussion was tabled.

**BIRD181.1: I-V TABLE CLARIFICATIONS**

Discussion was tabled.

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

Discussion was tabled.

**BIRD190: CLARIFICATION FOR REDRIVER FLOW**

Discussion was tabled.

**IBISCHK6 PARSER AND BUG STATUS**

Bob Ross reported that we are starting to draft a contract for the IBIS 7.0 parser development.

Bob reported that there is one bug report to be considered and that there are numerous others in the works but not yet officially submitted. Bob noted that BUG194 needs to be classified. The parser gives a TBD message for cases when [External Model] is not found for true differential [Model]s. Bob noted that there are two options to resolve the issue. The first is to change the message where an [External Model] is setup but not called. The second option is to point out which model has the issue and move to a new message number. He thought the parser developer can get back to us on what is the best option. Bob proposed to classify this as Annoying severity and Low priority. Bob noted that no one has reported issues with getting this message, and it was only found by reviewing the source code. Mike LaBonte stated that he preferred the option to give the [Model] name and Model\_type in the error message. Bob moved to classify BUG194 as Annoying severity and Low priority. Curtis Clark seconded the motion. There were no objections.

Michael Mirmak reported about a potential parser issue. Microsoft has issued a list of “banned” functions. Michael noted that he had asked the parser developer if any of these functions are used in the parser, and the developer confirmed that they are used. He noted that these are common functions such as strcpy(). Michael noted that some of these functions do not include input checking and can have buffer overruns which is a security concern. Mike noted that there are replacement functions. For example, strcpy() can be replaced with strcpy\_s(). He noted that Microsoft’s compilers generally support these replacement functions, but some other compilers do not support them even in new versions. Mike noted he has reached out to some parser owners about this issue, but if there are any parser owners that have not been contacted, please let him know. Walter Katz asked if it is a simple change to search and replace the new functions. Mike thought this could be done. Curtis Clark commented that this could be done on the parser owner’s side as well. Walter suggested for this to be a high priority change to the parser source code. Mike asked Michael if his concern is the parser executable or the parser source code. Michael replied that his concern is both. Mike noted he will send some of the discussion to Arpad Muranyi. Bob thought the parser developer can make the change. Mike noted that the IBIS parser has robust input checking, and he believes it does not have any inherent issues in this regard.

**NEW TECHNICAL ISSUES**

None.

**NEXT MEETING**

The next IBIS Open Forum teleconference meeting will be held January 5, 2018. The following IBIS Open Forum teleconference meeting is tentatively scheduled on January 26, 2018.

Mike LaBonte thanked everyone for their participation in 2017 and wished everyone a Happy New Year.

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

========================================================================

**NOTES**

IBIS CHAIR: Mike LaBonte

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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](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 15, 2017** | **November 17, 2017** | **December 1, 2017** | **December 15, 2017** |
| 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 | - | - | - | - |
| CST | User | Inactive | - | - | - | - |
| Ericsson | Producer | Inactive | - | - | - | - |
| GLOBALFOUNDRIES | Producer | Inactive | - | - | X | - |
| Huawei Technologies | Producer | Inactive | - | - | - | - |
| IBM | Producer | Inactive | - | - | - | - |
| Infineon Technologies AG | Producer | Inactive | - | - | - | X |
| Intel Corp. | Producer | Active | X | - | X | X |
| IO Methodology | User | Active | X | - | X | - |
| Keysight Technologies | User | Inactive | X | X | - | - |
| Maxim Integrated | Producer | Inactive | - | - | - | - |
| Mentor, A Siemens Business | User | Active | - | - | X | X |
| Micron Technology | Producer | Active | - | X | X | X |
| NXP | Producer | Inactive | - | - | - | - |
| Qualcomm | Producer | Inactive | X | - | - | - |
| Raytheon | User | Inactive | - | - | - | - |
| SiSoft  | User | Active | X | X | X | X |
| Synopsys | User | Active | - | - | X | X |
| Teraspeed Labs | General Interest | Active | - | - | X | X |
| Xilinx | Producer | Inactive | - | X | - | - |
| ZTE Corp. | User | Inactive | - | - | - | X |
| Zuken | User | Inactive | - | 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.