



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
Mentor, A Siemens Business
(formerly Mentor Graphics)

Micron Technology
Micron Memory Japan
NXP
Qualcomm
Raytheon
SiSoft

Synopsys

Teraspeed Labs
Xilinx
ZTE Corporation

Zuken

Joe Engert, Don Greer, Yan Liang, Hock Seow
Arpad Muranyi*, Nitin Bhagwath, Praveen Anmula
Fadi Deek, Raj Raghuram, Dmitry Smirnov
Bruce Yuan, Carlo Bleu, Chao Jiang, David Xu
Randy Wolff, Justin Butterfield*, Jeff Shiba, Harry Shin
Masayuki Honda, Tadaaki Yoshimura, Toshio Oki
(John Burnett)
Tim Michalka, Kevin Roselle, Irwin (Zhilong) Xue
Joseph Aday
Mike LaBonte*, Walter Katz*, Todd Westerhoff
Steve Silva
Kevin Li*, Ted Mido*, John Ellis, Scott Wedge
Wonsae Sim, Xuefeng Chen, Jinghua Huang
Yijiang Huang, Deng Shi, Yuyang Wang
Bob Ross*
Masao Nakane
Rongxing Ban, Xinjian Chen, Fengling Gao
Tao Guo, Lili Wei, Yangye Yu, Shunlin Zhu
Ralf Bruening, Michael Schaefer, Alfonso Gambuzza
Kiyohisa Hasegawa, Takayuki Shiratori

OTHER PARTICIPANTS IN 2017

A&D Print Engineering Co.
Abeism Corporation
Accton
ADLINK Technology
AMD Japan
Amphenol
Apollo Giken Co.
ASR Microelectronics
ASRock Rack
ASUS
Aurora System
Avant Technology
Avnet
BasiCAE
Brite Semiconductor
Calsonic Kansei Corp.
Canon
Casio Computer Co.
Celestica

Continental AG
Cybernet Systems

Y. Yoshida
Nobuyuki Kiyota
Raul Lozano
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Tadashi Arai
Fred Shen, Holly Wang
Satoshi Endo
Lili Dia, Shulong Wu
Eric Chien
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Murong Lu, Jiabin Sun
Jyam Huang, Chloe Yang
K. Ogasawara, M. Hinosugi
Kiki Li, Darcy Liu, July Tao, Lisa Wu
Haonan Wang
K. Hosoya
Syoji Matsumoto, H. Isono
Ikuo Imada
Wilson Chen, Sophia Feng, Lurker Li
Weiqing Liiu, Vincent Wen
Stefanie Schatt
Hideto Ishikura, Shiho Nagae, Takayuki Tsuzura

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eASIC	David Banas
Edadoc	Deheng Chen, Bruce (Jun) Wu, Hong Zhang
Eizo Corp.	K. Yamada
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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
Fujitsu Ltd.	Kohichi Yoshimi
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Inventec	Ian Chen, Ellen Tseng
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Lenovo Group	Shaogao Zheng, Paul Chu, John Lin, Alan Sun
Lexington Consulting	Mike Barg
Lite-On Technology	Sam (Dongru) Lyu
MD Systems Co.	Hideaki Kouzu
Megachips Corp.	T. Kitamura
Missouri Science and Technology	Giorgi Maghlakelidze
EMC Lab	
Mitsubishi Electric Corp.	Yusuke Suzuki
Modech	T. Ochiai
Mostec	Nelly Li, Clark Zhang

Murata Manufacturing Co.
Nanya Technology Corp.

NEC Platforms
Neophotonics Semiconductor GK
Novatek
Oki Electric Industry Co.
Panasonic Corp.
Panasonic Industrial Devices,
Systems and Technology Co.
Pegatron Corp.
Pioneer Corp.
Politecnico di Torino
PWB Corp.
Quanta Computer
Renesas Electronics Corp.

Ricoh Company
Ricoh Industry Co.
Rise Corp.
Rockchip
Rohm Co.
SAE-ITC
SAIC Motor Corp.
Samsung
Shanghai Fudan Microelectronics
Group
Shinewave
Signal Metrics
SII Semiconductor Corp.
SMICS
Socionext

Sohwa & Sophia Technologies
Sony Global Manufacturing &
Operations Corp.
Sony LSI Design
Sony Semiconductor Solutions
SPISim (Peace Giant Corp.)
Spreadtrum Communications
Stanford University
STMicroelectronics
Tatung Technology
Teledyne Lecroy

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Chingfeng Chen, Chiwei Chen, Andy (Weishen) Chih
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Atsushi Kitai
N. Manabe
Kazuki Wakabayashi

Melissa Huang, James Lee
K. Tochtani
Claudio Siviero, Stefano Grivet-Talocia, Igor Stievano
T. Ohisa
Eriksson Chuang, Aaron Lee, Scott Lee, Jerry Syue
M. Suzuki, N. Yokoshima, Kazunori Yamada
M. Hanagiri, T. Hayashi
Yasuhiro Akita, M. Goto, Kazuki Murata
Kohji Kurose, Toshihiko Makino
S. Yanagita
Junming Shi
Noboru Takizawa
(Thomas Munns), Jose Godoy
Weng Yang
Jung Hwan Choi
Zhenghui Chen, Liu Lu Fang, Xin Li, Yuezhi Liu
Xiao Lei Luo, Canghai Tang
Nike Yang
Ron Olisar
M. Murata
Sheral (Xuejiao) Qi
Shigeru Nishio, Watari Tanaka, Yumiko Sugaya
Shizue Kato, Yu Kamata, H. Ohmi, F. Kawafuji
Y. Sumimoto, M. Tomita, Megumi Usui
Tomoki Yamada
Taichi Hirano, A. Muto, T. Yuasa, T. Mizoroki

Satoshi Tago, Toru Fujii
K. Amano
Wei-hsing Huang, Walter Huang
Junyong Deng, Ganyue Wang, Shiqing Si
Tom Lee
Fabio Brina, Olivier Bayet
Barry Chen, Daniel Chen
Facun Li, Yifeng Wu

TFF Corp.	Katshuhiko Suzuki
Thine Electronics	S. Ikeda, T. Sada
TopBrain	Ye Li
Toshiba	Yasuki Torigoshi, Yoshinori Fukuba
Toshiba Development & Engineering Corp.	N. Kasai
Toshiba Electronic Devices & Storage Corp.	A. Tomishima, Yasunobu Umemoto, T. Tsujimura
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.

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.
2. 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.
3. 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>

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.