IBIS Open Forum Minutes

Meeting Date: June 26, 2020
Meeting Location: Teleconference

VOTING MEMBERS AND 2020 PARTICIPANTS

ANSYS	Curtis Clark*, Wei-hsing Huang, Marko Marin Shai Sayfan-Altman, Zilwan Mahmod
Applied Simulation Technology	(Fred Balistreri)
Broadcom	James Church, Jim Antonellis*
Cadence Design Systems	Zhen Mu, Ambrish Varma, Jared James Kumar Keshavan, Ken Willis
Cisco Systems	Stephen Scearce, Hong Wu
Dassault Systemes (CST)	Stefan Paret
Ericsson	Anders Ekholm, Sungjoo Yu, Thomas Ahlstrom
Google	Zhiping Yang, Shuai Jin, Zhenxue Xu
Huawei Technologies	(Hang (Paul) Yan)
IBM	Michael Cohen, Greg Edlund*
Instituto de Telecomunicações	(Abdelgader Abdalla)
Keysight Technologies	Radek Biernacki*, Hee-Soo Lee, Todd Bermensolo* Graham Riley, Pegah Alavi, Fangyi Rao Stephen Slater
Marvell	Steve Parker*, Johann Nittmann
Maxim Integrated	Joe Engert, Charles Ganal, Dzung Tran, Yan Liang
Mentor, A Siemens Business	Arpad Muranyi*, Raj Raghuram, Todd Westerhoff Weston Beal
Micron Technology	Randy Wolff*, Justin Butterfield
NXP	John Burnett
SerDesDesign.com	John Baprawski
SiSoft (MathWorks)	Mike LaBonte*, Walter Katz*, Graham Kus
Synopsys	Ted Mido*, Andy Tai
Teraspeed Labs	Bob Ross*
Xilinx	Ravindra Gali
ZTE Corporation	(Shunlin Zhu)
Zuken	Michael Schäder, Kazunari Koga
Zuken USA	Lance Wang*

OTHER PARTICIPANTS IN 2020

Accton	Tariq Abou-Jeyab
Achronix Semiconductor	Hansel Dsilva
Apollo Giken Co.	Satoshi Endo

Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Hsinho Wu*, Michael Mirmak*, Adrien Auge
	Fernando Mendoza, Taeyoung Kim, Wendem Beyene
	Oleg Mikulchenko, Nhan Phan, Ifiok Umoh
	Subas Bastola
Kandou Bus	Sherman Chen
KEI Systems	Shinichi Maeda
Kioxia Corporation	Yasuo Otsuka
OmniVision	Sirius Tsang
Qualcomm	Kevin Roselle, Sunil Gupta
Renesas	Genichi Tanaka
RITA Electronics	Takahide Nozaki
SAE ITC	Jose Godoy
Samsung	Wonsuk Choi
San Jose State University	Vincent Tam
Seagate	Preetesh Rathod, Alex Tain, Karthik Chandrasekar
	Emmanuel Atta
Signal Metrics	Ron Olisar
Silvaco Japan Co.	Yoshiharu Furui
SK Hynix Memory Solutions	Jongchul Shin, Alex Lee, James Yu
Socionext	Matsumura Motoaki, Shinichiro Ikeda
	Takafumi Shimada
SPISim	[Wei-hsing Huang]
Teradyne	Dongmei Han, Edward Pulscher, Sheri Zhuang
	Tomoo Tashiro, Paul Carlin, Tao Wang

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 17, 2020	627 261 744	Friday1

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

      https://tinyurl.com/IBISfriday-new

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.

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 5, 2020 IBIS Open Forum teleconference. Lance Wang moved to approve the minutes. Mike LaBonte seconded the motion. There were no objections

Randy reviewed ARs from the previous meeting.

1. Randy Wolff to send an email to the Open Forum announcing the academic membership vote [AR].
    Randy reported that this had been done.

2. Randy Wolff to send an email to the Open Forum announcing the BIRD204 vote [AR].
    Randy reported that this had been done.

3. Randy Wolff to send an email to the Open Forum announcing the BIRD205 vote [AR].
    Randy reported that this had been done.

4. Bob Ross to send the full text of the ibischk7.0.2 motion to Randy Wolff [AR].
    Bob and Randy reported this had been done.

5. Randy Wolff to send an email to the Open Forum announcing the ibischk7.0.2 vote [AR].
    Randy reported that this had been done.

6. Bob Ross to update the status of BUG202 on the webpage [AR].
    Bob reported that this had been done.

ANNOUNCEMENTS, **CALL FOR ADDITIONAL AGENDA ITEMS**
None.

MEMBERSHIP STATUS AND TREASURER'S REPORT
Bob Ross reported that we now have 24 members, as payment for 2020 membership had been received from Broadcom and Marvell. We expected the payments in July or August for the two remaining organizations that have yet to renew for 2020.   The quorum for meetings is 6. We have $24,578 cash flow for 2020 and a $24,928 adjusted balance for 2020. Bob said one half-year membership is proceeding slowly, and there is the possibility of a second half-year membership.

WEBSITE ADMINISTRATION

Steve Parker reported that the website was up to date with respect to ATM, Interconnect, and Quality task group minutes and documents. He had posted the minutes from the last Open Forum teleconference and the PI modeling presentation Randy Wolff and Zhiping Yang gave at that meeting. He had posted an ATM document from last summer to the ATM work archives after Michael Mirmak noticed it was missing. The recently submitted BIRD198.2 had been posted.

Steve and Mike LaBonte noted that the ibis.org domain name is registered under Mike's name, and it had not been anonymous. However, Mike had talked to Bluehost and found that domain privacy is included as part of the hosting package IBIS purchases. So, Bluehost has now enabled domain privacy.

MAILING LIST ADMINISTRATION

Mike LaBonte reported that mailing lists were generally operating smoothly. Our mailing lists' host, freelists.org, had been on one blacklist briefly. This had affected deliveries to two subscribers (from one company), but it had resolved itself and deliveries were working properly.

LIBRARY UPDATE

No update.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences
2020 IEEE International Symposium on EMC + SIPI (August 3-28, online)

        https://www.emc2020virtual.emcss.org/

Randy Wolff noted that the last week of the month-long event is dedicated to standards related activities.

- Press Update
None.

- Related standards
IEC 63055/IEEE 2401, JEITA "LPB"
No update.

SUMMIT PLANNING AND STATUS

- IEEE EMC + SIPI Symposium (August 3-28, online)
Bob Ross reported that we have informally settled on August 28th, the last day of the virtual conference, as the date of the IBIS presentation. We expect the time to be 1 to 5 p.m. CST, but this is not finalized. The first announcement will go out in July. Bob noted that one issue that

may also arise with other upcoming virtual meetings is whether to have live or prerecorded presentations. He said for EMC we will probably have live presentations.

- Tokyo Summit (November 13, 2020, online)
Bob and Randy Wolff said that there had been discussions with JEITA regarding planning for the Tokyo IBIS Summit. We are planning for a virtual event, and the date is still planned for November 13th, 2020. The event is normally in the afternoon local time, but the virtual event will be in the morning local time to allow some participation from attendees in the US during their evening hours. JEITA has asked for some presentations, such as Randy's IBIS Chair's Report, to be prerecorded. The event may consist of a mix of live and prerecorded presentations. Bob noted that we will still publish the presentations and may even make recordings available. Randy said that we will still follow the normal presentation review process, and we will figure out how to make virtual conferences work.

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. Mike reported that the group had been working on creating a license agreement for the freely distributed tools. Their draft license agreement, based on a BSD 3-clause license and crafted for IBIS, had been sent to and approved by SAE ITC legal. The remaining issue is how to convey it to users.

Mike reported that all the lawyers want, as a minimum, is to bundle the license agreement with the executables as a license.txt. One additional option being considered is to place the license agreement on the downloads webpage. This would allow people to read it and click a check box indicating approval. The group may take this up with Steve Parker, the webmaster, when they post it.

Mike noted that Radek Biernacki had suggested the possibility of including the license agreement text in the executables themselves. He said it could be done in the near term because they are planning for a new ibischk7.0.2, but they had concerns about doing it that way. Mike said the lawyers would still require it to be distributed as a license.txt in any event. He said the group was worried about having the executable display the license agreement every time it was run, for fear of breaking any tools that parsed its output. Displaying the message optionally wouldn't satisfy the lawyers at all. So, the group had decided not to pursue this approach at this time.

Mike said the license agreement grants the freedom to use, copy and distribute the binaries, but it will require any organization distributing them to bundle the license agreement with them. Mike said it would be best for such organizations to simply download the new .zip files, which will be posted to the website, and add the license agreement to their next release. He noted that the license agreement does not make any GNU style claims on the code that uses the executables.

Mike said that tsck2 is currently just a directory listing on the website. He said he will talk to Steve because it may need an html page derived from the ibischk download page so it can support the new license agreement distribution. Bob Ross said the bottom line is that executables will now be packaged as .zip files containing the license agreement. Mike noted that the ibischk7 page currently has links directly to executables, which isn't a great practice

anyway. He said we will likely go to three links, one for the Linux versions, one for the Mac version, and one for the Windows versions.

Mike also noted that the ibischk7 page currently states that executables are provided free of charge to "the electrical engineering community". He said that this ill-defined term does not appear in the license agreement and will be removed from the website.

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. He said Hansel Dsilva had recently proposed an editorial BIRD related to the use of the phrase "transition time" in the definition of Rx_Clock_Recovery_Mean, and the group had finished discussing it. Randy Wolff noted that a new BIRD had not been submitted in time for this meeting. Arpad said the group had also reviewed the newly submitted BIRD198.2 and corresponded with its authors. He said the group is now in initial exploratory discussions on how IBIS might help with PI modeling, a topic Zhiping Yang had proposed.

Task group material can be found at:

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

INTERCONNECT TASK GROUP
Randy Wolff reported that the group meets at 8:00 a.m. PT on Wednesdays. He noted that the focus is still on the EMD proposal (BIRD202), and recent discussions had centered on a section of text that had been rewritten into a list of rules. He said the group was still reviewing the section of text to be sure that all of its content had been captured in the new rules.

Task group material can be found at:

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

EDITORIAL TASK GROUP
Randy Wolff reported the task group remains suspended.

Task group material can be found at:

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

CHINA REGIONAL FORUM
Lance Wang reported that there had been no activity since the last Open Forum meeting.

China Regional Forum material can be found at:

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 1, 2020 until June 15, 2020. Of the 22 member organizations (as of June 15th), 10 had cast ballots and 12 had not. Each of the new officers had received 10 votes. Radek had announced the results on June 16, 2020, 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 (Marvell)
Postmaster	Mike LaBonte (SiSoft)

Randy thanked Radek for serving as the returning officer and handling the election process. Randy thanked the officers for their service to IBIS and said he looked forward to working with everyone.

- Academic Membership vote:

Randy Wolff noted that the topic had been introduced at the last meeting, and a vote had been scheduled for this meeting. The proposal is to establish an academic membership in IBIS with full voting rights but a membership fee of 50% of the normal fee. Bob Ross noted that they had chosen to define it as 50% so that it simply tracked the full membership fee and moved along with it.

Radek Biernacki asked if this was an amendment to our policies and procedures, and would it have to be ratified by SAE? Bob said that our policies and procedures were purposefully vague on this topic and do not establish fees. They state that the fees are set by the Open Forum, and that's why we vote in the Open Forum each year to set the membership fee. Bob said this proposal was just establishing another membership fee and did not require a change to policies and procedures. Randy noted that we had informed SAE-ITC about the proposed change, and they had no issues with it.

Arpad Muranyi asked if this affected the cost of source code licenses. Randy said source code purchases are entirely separate from membership fees, and there is no change to that pay structure. That would be separate discussion.

Mike LaBonte asked if the information about this new membership type would be recorded anywhere. Randy said we should update the IBIS FAQ page. Mike moved to establish a new paid membership category for IBIS Open Forum, "Academic", with yearly dues set at 50% of the company member rate. Lance Wang seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes
Broadcom – yes
Cadence – no (email vote)
Google – yes (email vote)
IBM – yes
Keysight – yes
Marvell – yes
Mentor – yes
Micron – yes
SiSoft – yes
Synopsys – yes
Teraspeed Labs – yes
Zuken - yes

The roll call vote concluded with a vote tally of Yes – 12, No – 1, Abstain – 0. The vote passed.

Randy said the board would review the information on the IBIS FAQ page [AR].

BIRD198.2: KEYWORD ADDITIONS FOR ON DIE PDN (POWER DISTRIBUTION NETWORK) MODELING

Randy Wolff introduced BIRD198.2 on behalf of the authors. He said that this revision contains more editorial changes and technical clarifications. He noted that it had been reviewed by a small working group and discussed in the ATM task group. There had been correspondence with the authors in Japan, and they had agreed to the revisions suggested by ATM.

This BIRD establishes a way of providing a simple on-die decoupling model. It is a two terminal model, and the terminals are defined using signal_name or bus_label. The model provides a decoupling capacitor with an equivalent series resistance and a leakage resistance. The BIRD allows for providing multiple PDN models in parallel and for creating different power domains. It allows methods for corner selection based on process corner for the PDN model. Randy asked everyone to review the new revision in anticipation of a vote at a future meeting.

Greg Edlund asked if there was a mechanism for spatially distributing the capacitors. Randy said the BIRD would allow you to attach the capacitor models to different bus_labels. Michael Mirmak and Arpad Muranyi noted that IBIS has no geometric information whatsoever. Arpad said you could connect the PDN models to the Pin Mapping buses, and whatever physical meaning those might have would come along.

Randy and Arpad said BIRD198.2 provides for a simple on-die PDN model, and if you want a more complicated model you should use the BIRD189 interconnect syntax. Arpad said this issue had come up early on in the discussions of BIRD198. Some had suggested that you could do it with BIRD189 syntax, but the authors and others felt the BIRD189 syntax was too complex and elaborate for this type of simple RC circuit, which is sufficient for many

applications.

Randy said that BIRD198.2 does provide some mechanism for corner cases, which really isn't provided in BIRD189. Arpad said that strictly speaking BIRD189 does not cover corners, but it provides the [Interconnect Model Group] keyword that allows the model maker to provide different groups that could represent corner cases. It just isn't tied to the typical corner mechanism. Randy agreed. Arpad noted that the ATM group intentionally didn't want any capability in BIRD198.2 that couldn't be replicated with BIRD189 syntax. He said that right now people want BIRD198.2 because they're more comfortable with it. In the future, after people are comfortable with BIRD189, we wouldn't want people having to use BIRD198.2 because BIRD189 couldn't do what they wanted. Randy said that the authors see lots of interest in these simple BIRD198.2 models, which will work for most people and most vendors are willing to share.

BIRD204: DQ DQS GETWAVE FLOW FOR CLOCK FORWARDING MODELING
Walter Katz said this BIRD had been posted for quite some time, and there had been no comments or further discussion. He said that as he had further studied the physics of the problem on the DRAM and controller sides, he had not encountered any new issues this proposal couldn't address.

Bob Ross noted that his editorial comment from a prior meeting that "DLL" should be replaced with "executable model" had not yet been addressed. Randy Wolff and Radek Biernacki suggested this could be handled as an editorial issue later. Walter noted that instances of "DLL" appeared in IBIS 7.0. Bob said he preferred to address the issue before voting on the BIRD, but Randy proposed we add an entry to the known issues document for IBIS 7.0, and the group preferred that option. Suggestions included adding a sentence explaining that instances of "DLL" could be taken to mean executable model, but the final solution was not for this meeting to decide. Randy said he would add an entry about the "DLL" issue to the known issues document for IBIS 7.0, which would cover the entire specification when the editorial task group prepares IBIS 7.1 [AR].

Walter moved to vote on the BIRD. Radek seconded. There were no objections.

The roll call vote tally was:

ANSYS – yes
Broadcom – abstain
Cadence – yes (email vote)
Google – abstain (email vote)
IBM – yes
Keysight – yes
Marvell – yes
Mentor – yes
Micron – yes
SiSoft – yes
Synopsys – yes
Teraspeed Labs – yes

Zuken - yes

The roll call vote concluded with a vote tally of Yes – 11, No – 0, Abstain – 2. The vote passed.

Randy gave Steve Parker an AR to update the status of BIRD204 on the website [AR].

BIRD205: NEW AMI RESERVED PARAMETER FOR SAMPLING POSITION IN AMI_INIT FLOW

Arpad Muranyi summarized the BIRD on behalf of Hansel DSilva. He said the BIRD resolved an omission in the statistical AMI flow in that the model did not have a way to define the sampling point to be used by the EDA tool. Several different EDA tools had selected the sampling point differently and produced different eyes even when everything else was the same. This BIRD introduces a new AMI parameter that allows the AMI_Init function to return the time of the UI sampling point with respect to the t=0 time of the impulse response it returns. Todd Bermensolo moved to vote on the BIRD. Arpad seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes
Broadcom – abstain
Cadence – yes (email vote)
Google – abstain (email vote)
IBM – yes
Keysight – yes
Marvell – yes
Mentor – yes
Micron – yes
SiSoft – yes
Synopsys – yes
Teraspeed Labs – yes
Zuken - yes

The roll call vote concluded with a vote tally of Yes – 11, No – 0, Abstain – 2. The vote passed.

Randy Wolff gave Steve Parker an AR to update the status of BIRD205 on the website [AR].

BIRD201.1: BACK-CHANNEL STATISTICAL OPTIMIZATION

Walter Katz said no comments had been received since BIRD201.1 was posted. Walter moved to schedule a vote on the BIRD at the July 17, 2020 IBIS Open Forum teleconference. Bob Ross 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.

BIRD202: ELECTRICAL DESCRIPTIONS OF MODULES
Discussion was tabled.

IBISCHK PARSER AND BUG STATUS
Bob Ross moved to authorize spending $800.00 for developing ibischk7 version 7.0.2 to fix BUGs 203, 204, 206, 210, 211, 212, and 213 by approximately July 17, 2020. Arpad Muranyi seconded. There were no objections.

The roll call vote tally was:

ANSYS – yes
Broadcom – abstain
Cadence – yes (email vote)
Google – yes (email vote)
IBM – yes
Keysight – yes
Marvell – yes
Mentor – yes
Micron – yes
SiSoft – yes
Synopsys – yes
Teraspeed Labs – yes
Zuken - yes

The roll call vote concluded with a vote tally of Yes – 12, No – 0, Abstain – 1. The vote passed.

Bob to notify the parser developer with the agreement already approved by SAE-ITC [AR].

NEW TECHNICAL ISSUES
- Interconnect Syntax Example
Randy Wolff shared the IBIS version 7.0 page and noted the link to an IBIS 7.0 interconnect model syntax example. He recalled that an updated version of the model had been posted in April. He said a new version had just been posted because someone had reported a syntax error in one of the included IBIS-ISS subcircuits. Feel free to download the updated examples.

NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on July 17, 2020. The following teleconference meeting is tentatively scheduled for August 7, 2020.

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.

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

Other trademarks, brands and names are the property of their respective owners.

SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	April 24, 2020	May 15, 2020	June 05, 2020	June 26, 2020
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Active	-	X	X	X
Cadence Design Systems	User	Active	-	X	X	X
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
Google	User	Active	X	X	X	X
Huawei Technologies	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
IBM	Producer	Active	X	X	-	X
Keysight Technologies	User	Active	X	X	X	X
Marvell	Producer	Active	X	X	X	X
Maxim Integrated	Producer	Inactive	-	-	-	-
Mentor, A Siemens Business	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
NXP	Producer	Inactive	-	-	-	-
SerDesDesign.com	User	Inactive	-	-	-	-
SiSoft	User	Active	X	X	X	X
Synopsys	User	Active	X	X	X	X
Teraspeed Labs	General Interest	Active	X	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.