IBIS Open Forum Minutes

Meeting Date: December 10, 2021
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2021 PARTICIPANTS

Analog Devices (Maxim Integrated)	Tushar Pandey, Pawan Sai, Yan Liang, Glenn Amparo, Jermaine Lim*, Rolynd Aquino
ANSYS	Curtis Clark*, Wei-Hsing Huang, Miyo Kawata
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan)
Cadence Design Systems	Zhen Mu*, Ryo Sato, Takuya Moriya, Tadaaki Yoshimura, Morihiro Nakazato, Masahiro Nakahara, Yitong Wen
Celestica	(Sophia Feng^)
Cisco Systems	(Stephen Scearce), Guobing Han
Dassault Systemes (CST)	Stefan Paret, David Duque, Longfei Bai
Ericsson	(Guohua Wang)
Google	Zhiping Yang*, Songping Wu
Huawei Technologies	Hang (Paul) Yan, Kai Zhao, Liqing Guang, Peng Xiao, Wei Gao, Hai Wen, Xiaojun Zhou, Xusheng Liu, Xing Wang, Zhang Hui
Infineon Technologies AG	(Christian Sporrer^)
Instituto de Telecomunicações	(Abdelgader Abdalla)
Intel Corporation	Hsinho Wu*, Michael Mirmak*
Keysight Technologies	Radek Biernacki*, Fangyi Rao, Pegah Alavi, Todd Bermensolo, Majid Ahadi Dolatsara, Xiuguo Jiang, Jiarui Wu
Keysight Technologies Japan K.K.	Toshinori Kageura, Yoshio Akashi, Satoshi Nakamizo
Luminous Computing	David Banas
Marvell	Steven Parker*
MathWorks (SiSoft)	Mike LaBonte*, Walter Katz*
Micron Technology	Randy Wolff*, Justin Butterfield*, Aniello Viscardi, Akshay Shivaji Chaudhari, Dragos Dimitriu, Chunqiang Weng, Hongyan Li, Tree Li, Zhang Cheng
Micron Memory Japan, G.K.	Masayuki Honda, Mikio Sugawara
MST EMC Lab	Chulsoon Hwang, Anfeng Huang, Yifan Ding, Ling Zhang
NXP	Jon Burnett
SerDesDesign.com	(John Baprawski)
Siemens EDA (Mentor)	Arpad Muranyi*, Weston Beal
Siemens AG	Franz Pfleger, Sebastien Kollinger
Siemens Electronic Design Automation Japan K.K.	Kunimoto Mashino
STMicroelectronics	(Gerard Mas), (Olivier Bayet^)
Synopsys	Ted Mido*, Andy Tai, Claire Cao, Jinghua Huang, Kevin Li, Xuefeng Chen, Yuyang Wang, Zhishuan Ye

Teraspeed Labs	Bob Ross*
Xilinx	(Romi Mayder)
ZTE Corporation	Bowen Shen, Changgang Yin, Dongdong Ye, Liqiang Meng, Xiaoxuan Liu, Hongbin Shi, Jian Huang, Jinlong Li
Zuken	Michael Schäder, Chithrupa Ramesh
Zuken USA	Lance Wang*
Zuken Japan	Kensuke Yoshijima, Shiratori Takayuki

OTHER PARTICIPANTS IN 2021

A&D Print Engineering Co., Ltd.	Ryu Murota, Minoru Hasegawa
Achronix Semiconductor	Hansel Dsilva
AET, Inc.	Keisuke Tqahara
Alibaba, Inc.	Cassie Yan
AMD Japan	Tadashi Arai
Analog Devices	Patrick Deroy
Apollo Giken Co., Ltd.	Satoshi Endo
ATE Service Corporation	Yutaka Honda
Aurora System Inc.	Hitoshi Ishikawa
AVL Software and Functions	Wolfgang Röhrner
Blue Ocean Smart System	Junyong Deng
Canon Components Inc.	Takeshi Nagata
Canon Inc.	Syouji Matsumoto, Satoru Ishikawa
Ciena	Taha Kheyar, Kaisheng Hu
CMK Corporation	Motoshi Nakamura, Masaki Abe
Continental Automotive	Julnar Musmar, Stefanie Schatt
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De Montfort University (IEEE EMC)	Alistair Duffy
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Elite Material Co.	Nick Huang
Empyrean	Chenghan Jia, Jiajie Zhao, Yuting Yin, Tao Zhang
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Fujitsu Limited	Takashi Kobayashi, Hideki Takauchi, Yoshio Nabeyama, Makoto Yoshino
Fujitsu Optical Components Limited	Masaki Kunii
Fujitsu Interconnect Technologies Limited, Japan	Masaki Kirinaka
Fulhan	Zhengyi Zhu
Furukawa Electric Co., Ltd.	Takumi Ohuchi
H3C	Xinyi Hu, Muwang Ye, Zixiao Yang
Hamamatsu Photonics K.K.	Akihiro Inoguchi
Hamburg University of Technology	Cheng Yang
Harbin Institute of Technology	Gang Zhang
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Hoya Corporation	Masayuki Hagiwara

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Integran Co., Ltd.	Norio Miyamoto
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IT-Beratung-Maurer	Manfred Maurer
Japan Aviation Electronics Industry Limited	Kentaro Toda
Japan Radio Co., Ltd.	Hiroto Katakura, Takashi Sato, Youichi Suzuki
JEDAT Inc.	Nobuto Ono
JEITA	Akihiko Kawasaki, Kyoji Yamazaki, Hisashi Saito
Jujube LLC	Taiji Hosaka
JVC Kenwood Corporation	Yasutoshi Ojima, Hidetoshi Suzuki, Takuo Fujimura
Kandou Bus	Sherman Chen
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Keita Smart Mirai Creations Co., Ltd.	Keita Miyasato
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Kioxia Systems Co., Ltd.	Jyun Shibasaki, Tomomichi Takahashi, Yukio Tanoue
Konica Minolta, Inc.	Takeshi Nomura
Kyocera Corporation	Aki Tanaka
MD Systems Co., Ltd.	Hidetoshi Ogawa
Megachips Corporation	Tomochika Kitamura
Mercury Systems	Vincent Tam
Microchip Norway	Lars Snith
Mitsubishi Electric Corporation	Yusuke Suzuki, Masaki Watanabe
Mitsubishi Electric Corporation	Yasuhiro Segawa
Mitsumine-Denshi Co., Ltd.	Ryouichi Nakahigashi
Modech Inc.	Tadashi Akio
Molex Japan LLC	Masashi Iwata
Murata Manufacturing Co., Ltd.	Hideki Miyazawa, Seiji Hidaka, Shigeaki Hashimoto
NTT Electronics Cross Technologies Corporation	Megumi Nagata
Panasonic Corporation	Shinichi Tanimoto, Shingo Enomoto, Atsushi Nakano
Politecnico di Torino	Stefano Grivet-Talocia, Paolo Manfredi, Alessandro Zanco, Felipe Treviso, Marco Destefano, Riccardo Trinchero, Tomasso Bradde
PWB Corporation	Toru Ohhisa
Renesas Electronics Corporation	Kazuyuki Sakata, Masato Suzuki, Kazuaki Tsuchiyama, Kazunori Yamada, Jyunichi Yamada, Billy Chen, Mengting Liao
Ricoh Company, Ltd.	Toshihiko Makino, Hisao Kurosu, Nobuo Nakane, Miyoko Goto
Ricoh Electronic Devices Co., Ltd.	Takeshi Hara
Rohm Co., Ltd.	Nobuya Sumiyoshi, Kenichi Ozaki
RTC	Ken Whigham

SAXA, Inc.	Takayuki Ito, Takayuki Sato
Schneider Electric Japan Holdings Ltd.	Hiroaki Fujita
Seiko Epson Corporation	Toshiyuki Nishiyama
Sihi Semiconductor	Ying He
Shimadzu Corporation	Kazuo Nakajima
Silvaco Japan Co., Ltd	Yoshihiko Yamamoto
Simberian	Yuriy Shlepnev
Socionext Inc.	Shizue Kato, Hajime Ohmi, Motoaki Atsumura, Megumi Ohno, Ayako Kitamoto
Sohwa & Sophia Technologies	Tomoki Yamada
Sony Global Manufacturing & Operations Corporation	Yuichi Ikeya, Atsushi Yoshimoto
Sony LSI Design Inc.	Kazuki Murata, Toru Fujii
Sony Semiconductor Manufacturing Corporation	Kengo Imazato
Technopro Design Company	Mai Fukuoka
Teikyo Heisei University	Kohtaro Hachiya
Tektronix & Fluke Corporation	Katsuhiko Suzuki
Tektronix Company	Takafumi Watanabe
Teradyne	Tao Wang, Tomoh Tashiro
Tokyo Drawing Ltd.	Masahiko Nakamura
Tomen Devices Corporation	Kinji Mitani
Toshiba Corporation	Yasuki Torigishi
Toshiba Development & Engineering Corporation	Nobuyuki Kasai, Nobuhiro Tsuruta
Toshiba Electronic Devices & Storage Corporation	Atsushi Tomishima, Toshihiro Tsujimura, Yoshinori Fukuba
University of Illinois, Urbana	Jose Shutt-Ainé, Xinying Wang
WADOW	Kazuhiko Kusunoki
Xpeedic	Bing Sun, Chengzhi Hu, Huashan Cui, Max Cang, Qiujie Zhang, Ruijie Zhao, Sophia Gui, Wei He, Yiwei Yang, Yunbing Xia, Zhouxiang (Zachary) Su, Wenliang Dai, Yan Liu
Yamaha Corporation	Hiroyuki Kai, Tetsuya Kakimoto
Yazaki Parts Co., Ltd.	Kenichi Fujisawa
Yokogawa Electric Corporation	Daisuke Kamezawa

In the list above, attendees at the meeting are indicated by *. Those submitting an email ballot for their member organization for a scheduled vote 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 connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting

Join on your computer or mobile app

[Click here to join the meeting](#)

Join with a video conferencing device

Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

Or call in (audio only)
+1 267-768-8015,554664847#   United States, Philadelphia
Phone Conference ID: 554 664 847#
Find a local number | Reset PIN
Learn More | Meeting options

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 had been 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 12, 2021 IBIS Asian Summit (Japan). Lance Wang moved to approve the minutes, Curtis Clark seconded the motion. There were no objections.

Randy called for comments on the minutes of the November 19, 2021 IBIS Asian Summit (China). Lance moved to approve the minutes, Curtis seconded the motion. There were no objections.

Randy called for comments on the minutes of the November 19, 2021, IBIS Open Forum teleconference. Curtis moved to approve the minutes. Arpad Muranyi seconded the motion. There were no objections. Bob Ross commented that the DOCX file had not yet been posted online.

Randy reviewed ARs from the previous meeting.

- Randy Wolff to check on DesignCon room availability and cost for either Monday or Friday [AR].
  Randy said this was done

- Randy Wolff to send email ballot for IBIS 7.1 approval [AR].
  Randy said this was done. Some member companies had no one subscribed, and Randy had reached out to them.

- Randy Wolff to suggest dates for 3 potential 2022 summits [AR].
  Randy said we had updated information, but no dates yet.

ANNOUNCEMENTS, **CALL FOR ADDITIONAL AGENDA ITEMS**

None.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that our account balance was $27,743, with a balance adjusted for 2021 of $28,193. Bob had moved $2,900 to apply to 2022. One member had prepaid for 2022 membership dues, and there may be another prepayment. Total membership status was unchanged, with 29 members, and a quorum of 8. 27 members paid in 2021 including two from 2020 prepayments. Waymo would be split off from Google in 2022, but Zhiping Yang would remain affiliated with Google until their separate payment was received in 2022. A 2021 half year member may or may not rejoin in 2022.

A full payment of $17,500.00 for ibischk7 version 7.1.0 was expected to be made by the end of the year. That was budgeted for 2021 by SAE ITC as a capital expense. SAE ITC will deduct a charge for their services sometime around February of 2022.

Radek Biernacki asked if the new IBICHK code have been accepted and the parser development payment had had been made. Bob said the final code had not yet been received. A few changes still had to be made. Delivery had been expected in the current week, hopefully it would happen the following week.

WEBSITE ADMINISTRATION

Steven Parker reported he added the Analog Devices logo, replacing the Maxim Integrated logo. The events list had been updated. The Free Tools link was changed. There was an email forwarder issue for info@ibis.org, emails received at that address were not being distributed to the intended people. Steve was working with BlueHost to fix that.

MAILING LIST ADMINISTRATION

Curtis Clark reported that all was well. New subscribers had been added for some member organizations to ensure they would receive ballot notices. Bob Ross said they were still trying to find a contact person for Ericsson.

LIBRARY UPDATE

Zhiping Yang reported that no one had sent an updated information. He and Randy Wolff encouraged people to try adding models to the open-source model website. People could contact Zhiping with questions. Bob Ross asked if there was a link to the GitHub repository on

our web pages. Randy Wolff checked, there was not. Bob said the links on the page should be checked, but that required some caution.

Zhiping Yang to send models page updates to Steve Parker [AR]

Steve Parker to update Models page [AR]

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

Randy Wolff said we were not tracking any new conferences.

- Press Updates

None.

- Related standards

IEC 63055/IEEE 2401, JEITA "LPB"

Michael Mirmak reported that there was no update.

SUMMIT PLANNING AND REVIEW

Randy Wolff said minutes from recent summits were all posted. He thanked the presenters. There had been 148 attending the Japan summit, and 64 attending the China summit.

Randy said he had contacted Suzanne Deffree of Informa Markets about DesignCon. They had a Hyatt room available Friday, April 8, 2022, at no cost to IBIS. The room would hold up to 80 people. We would cover AV, food, and beverage costs. We needed to get back to Informa before too long. Randy leaned toward holding a hybrid event, with both in-person and remote attendees. Bob Ross agreed with that.

QUALITY TASK GROUP

Mike LaBonte said the group meets on Tuesdays at 9:00 a.m. PT. Weston Beal had joined to discuss possible enhancements to the IBIS Quality Specification and the associated checklist. Mike said the Quality Task Group had formed in 2002 to produce those documents, and newer IBIS specifications had keywords that might be added.

Michael Mirmak had joined to discuss a new enhancement request for IBISCHK, to check for consistency between the root name in AMI files and the AMI_parameters_in and AMI_parameters_out DLL strings.

The group continued to oversee the next ibischk release, ibischk7.1.0. Details would be discussed later in the meeting.

Bob Ross said the root name consistency requirement should be clearly stated in IBIS. Arpad Muranyi asked if the DLL functions would be executed. Mike said they would. Radek Biernacki said we may not need the requirement to have consistency. Arpad said he had seen models that had problems when there was a mismatch. Walter Katz felt the specification already required matching. Arpad asked if the issue was about requiring the DLL to check for what it expected. Walter said the DLL and AMI file were paired together, and that set the expectation that the DLL would look for a root name matching the AMI root name. Michael Mirmak said checking by the DLL would not be required. Walter agreed, saying the DLL could check but did not have to. He suggested continuing discussion in the ATM group. Randy Wolff agreed.

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 a.m. PT, but the group had decided to take the rest of the year off. Meetings would resume in January of 2022.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak reported that the Interconnect task group remained suspended. Its former time slot was being used by the Editorial task group.

Task group material can be found at:

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

EDITORIAL TASK GROUP

Michael Mirmak reported that the previous two meetings had been cancelled, with the draft IBIS 7.1 submitted for approval. They would decide by email if more meetings would be needed, based on changes to be made as a result of the voting process.

Task group material can be found at:

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

NEW ADMINISTRATIVE ISSUES

None

IBIS 7.1 RATIFICATION

Randy Wolff showed draft 20 of IBIS 7.1. He said it had been out for review, and a notice of planned vote had been sent. Michael Mirmak said no comments had been received. Radek Biernacki thanked the Editorial Group, saying they had done a good job and there was quite a bit to read. Randy said the new specification had 403 pages. Bob Ross said only one sentence had changed from draft 19 to 20. Michael listed the few changes required to convert the draft to an official specification for posting as a final document. He clarified that no additional requested changes would need to be edited in after a vote, draft 20 incorporated all requested changes.

Arpad Muranyi moved to vote to approve the draft as official IBIS 7.1. Walter Katz seconded the motion.

The roll call vote tally was:

- Analog Devices - yes
- ANSYS – yes
- Cadence – yes
- Celestica – yes (email vote)
- Google – yes
- Infineon Technologies – yes (email vote)

- Intel – yes
- Keysight – yes
- Marvel – yes
- MathWorks – yes
- Micron – yes
- Siemens EDA – yes
- ST Microelectronics – yes (email vote)
- Synopsys – yes
- Teraspeed Labs – yes
- Zuken – yes

The vote concluded with a tally of Yes – 16, No – 0, Abstain – 0. The motion passed.

Randy had not seen the emailed vote from ST Microelectronics. Mike LaBonte said it had been sent by Olivier Bayet to Mike and to chair@ibis.org.

Arpad suggested looking at the open BIRDs to see which ones we might consider rejection votes for, and which to update for acceptance votes. Randy showed the list. Arpad said BIRD 211.3 would need page number updates, and then it should be ready for a vote.

Arpad asked if an editorial meeting was needed. Michael said he would make the document changes, and a brief meeting might be called for.

We discussed press coverage for the new specification. Randy said he would email the IBIS reflector and contact SAE ITC about a press release. He would also contact SI Journal and possibly other magazines about writing an article.

Michael Mirmak to send official IBIS 7.1 document [AR]

Randy Wolff to announce approval of IBIS 7.1 to email reflector [AR]

Randy Wolff to contact SAE ITC about IBIS 7.1 press release [AR]

Randy Wolff to contact press outlets about IBIS 7.1 article [AR]

Steve Parker to update IBIS website for IBIS 7.1 [AR]

BIRD211.3: IBIS AMI REFERENCE FLOW IMPROVEMENTS

Discussion was tabled.

BIRD213: EXTENDING IBIS-AMI FOR PAMn ANALYSIS

Discussion was tabled.

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.

BIRD210: NEW REDRIVER AMI FLOW

Discussion was tabled.

REVIEW OF IBIS 7.1 DRAFT

IBISCHK AND TSCHK PARSER AND BUG STATUS

Bob Ross said we were waiting for the next code drop from the developer, which hopefully would be final. Some last-minute fixes were small, such as not having the new command line arguments in the help text. A problem parsing multiple spaces in a ".subckt" line was fixed. The Quality group would approve the code release for contract fulfillment. SAE ITC would make the payment. The programs would be made available for download. Source code would be distributed to IBISCHK7 parser licenses.

Bob said some EDA tools depended on the matching of AMI root names and what the DLL expected. He said IBIS should clearly require that before any IBISCHK change would be considered.

Arpad asked when IBISCHK7.1.0 would be released. Bob said it should be not many days after it was received from the developer. Randy Wolff felt it could be released as early as next week. He said there was more complexity in the software than anticipated.

Bob said the linkage checking between IBIS and Touchstone files also required more work than expected. Randy said the specification was better due to what had been found.

Michael Mirmak asked which task group should address the root name issue. Mike LaBonte suggested starting with ATM. Once the requirement was settled, possibly requiring a BIRD, it could be taken up by the Quality group as an IBISCHK change.

NEW TECHNICAL ISSUES

Walter Katz said the interconnect group might address new Touchstone changes. He said in IBIS you could update the version in an existing file, and it would still pass IBISCHK. He felt the same should be true for Touchstone 2.1. He said that was not the case for Touchstone 2.0, which required new keywords. Walter suggested that after making that change, enhancements could be added. Arpad asked if that was possible, due to an order of ports requirement. Walter said without [Number of Ports] the file name would give the port count. Randy Wolff said the low adoption of Touchstone 2.0 was a problem, and any new changes should consider that.

NEXT MEETING

The next IBIS Open Forum teleconference meeting would be held on January 7, 2022. The following teleconference meeting was tentatively scheduled for January 28, 2022.

Randy thanked everyone for the year of work on IBIS.

Randy Wolff moved to adjourn. Radek Biernacki 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 or unsubscribe from the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org):
    - https://www.freelists.org/list/ibis
    - https://www.freelists.org/list/ibis-users

- To subscribe to or unsubscribe from one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, ibis-editorial@freelists.org, or ibis-quality@freelists.org:
    - https://www.freelists.org/list/ibis-macro
    - https://www.freelists.org/list/ibis-interconn
    - https://www.freelists.org/list/ibis-editorial
    - https://www.freelists.org/list/ibis-quality
- 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	(Summit) November 12, 2021	(Summit) November 19, 2021	November 19, 2021	December 10, 2021
Analog Devices (Maxim Integrated)	Producer	Active	-	-	X	X
ANSYS	User	Active	-	-	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	X	X	X	X
Celestica	User	Inactive	-	-	-	X
Cisco Systems	User	Inactive	-	X	-	-
Dassault Systemes	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
Google	User	Active	-	-	X	X
Huawei Technologies	Producer	Inactive	-	X	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	X
Instituto de Telecomunicações	User	Inactive	-	-	-	-
Intel Corp.	Producer	Active	-	-	X	X
Keysight Technologies	User	Active	X	X	X	X
Luminous Computing	General Interest	Inactive	-	-	-	-
Marvell	Producer	Active	-	-	X	X
MathWorks (SiSoft)	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
MST EMC Lab	User	Inactive	-	X	-	-
NXP	Producer	Inactive	-	-	-	-
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA (Mentor)	User	Active	X	-	X	X
STMicroelectronics	Producer	Inactive	-	-	-	X
Synopsys	User	Active	X	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-		-	-
ZTE Corp.	User	Inactive	-	X	-	-
Zuken	User	Active	X	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 (voting by email counts as attendance)

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.