



## IBIS Open Forum Minutes

Meeting Date: **May 17, 2019**

Meeting Location: **Teleconference**

### VOTING MEMBERS AND 2019 PARTICIPANTS

ANSYS	Curtis Clark*, Marko Marin, Miyo Kawata Toru Watanabe, Akira Ohta
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan)
Cadence Design Systems	[Brad Brim], Ambrish Varma, Ken Willis Yingxin Sun, Zhen Mu
Cisco Systems	(Stephen Searce)
Dassault Systemes (CST)	Stefan Paret
Ericsson	Anders Ekholm, Anders Vennergrund, Felix Mbairi Hui Zhou, Inmyung Song, Mattias Lundqvist Wenyan Xie, Zilwan Mahmud
GLOBALFOUNDRIES	Steve Parker
Google	Zhiping Yang, Songping Wu
Huawei Technologies	Antonio Ciccomancini
Futurewei Technologies	Albert Baek
IBM	Michael Cohen*, Greg Edlund
Infineon Technologies AG	Anke Sauerbrey
Instituto de Telecomunicações	(Abdelgader Abdalla)
Intel Corporation	Hsinho Wu*, Michael Mirmak*, Nhan Phan Kinger Cai, Eddie Frie, Wendem Beyene Yuanhong Zhao
IO Methodology	[Lance Wang]
Keysight Technologies	Radek Biernacki*, Hee-Soo Lee, Stephen Slater Jian Yang, Ming Yan, Pegah Alavi
Maxim Integrated	Joe Engert, Yan Liang, Charles Ganai
Mentor, A Siemens Business	Arpad Muranyi*, Raj Raghuram, Weston Beal Vladimir Dmitriev-Zdorov, Mikael Stahlberg Todd Westerhoff, Ed Bartlett, Nitin Bhagwath
Micron Technology	Randy Wolff*, Justin Butterfield
NXP	(John Burnett)
Raytheon	Joseph Aday
SiSoft (MathWorks)	Mike LaBonte*, Graham Kus, Walter Katz*
SPISim	Wei-hsing Huang*
Synopsys	Ted Mido*, Adrien Auge, John Ellis, Sam Sim Scott Wedge
Teraspeed Labs	Bob Ross*

Xilinx	Ravindra Gali
ZTE Corporation	(Shunlin Zhu)
Zuken	(Michael Schaefer)
Zuken USA	Lance Wang*

**OTHER PARTICIPANTS IN 2019**

Apollo Giken Co.	Satoshi Endo
Hitachi	Norio Chujo
John Baprawski, Inc.	John Baprawski
KEI Systems	Shinichi Maeda
Marvell	Johann Nittmann
OmniVision	Sirius Tsang
Qualcomm	Kevin Roselle
Renesas	Genichi Tanaka
Ricoh Co.	Kazuki Murata
SAE ITC	(Jose Godoy)
Seagate	Alex Tain
Signal Metrics	Ron Olisar
Silvaco Japan Co.	Yoshiharu Furui
Socionext	Megumi Ono, Motoaki Matsumura, Yuji Nakagawa
Toshiba	Imi Hitoshi
Toshiba Electronic Devices & Storage Corp.	Atsushi Tomishima

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
June 7, 2019	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.

## **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 April 26, 2019 IBIS Open Forum teleconference. Michael Mirmak moved to approve the minutes. Bob Ross seconded the motion. There were no objections.

Mike reviewed ARs from the previous meeting.

1. Mike to discuss BIRD199 in the Quality task group as it relates to the parser [AR]. Mike reported this as done. The discussion was related to parser messages, but the specification needs changes for clarifications.
2. Michael Mirmak to find out if the IEEE P2401 meeting at DAC is open to anyone [AR]. Michael reported he has not been able to confirm this so far. He should be able to get confirmation before the meeting minutes go out.
3. Mike to add Arpad Muranyi to the Quality task group meeting invite [AR]. Mike reported this as done. This was related to discussing BIRD199.
4. Mike to send out a reminder about the Touchstone survey noting the end date [AR]. Mike reported this as done. Several notices have gone out about the survey.

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

Bob Ross noted in previous meeting minutes there was discussion related to BUG202, but this was really BUG203.

Michael Mirmak moved to amend the April 26, 2019 minutes with this change. Bob seconded the motion. There were no objections.

## **MEMBERSHIP STATUS AND TREASURER'S REPORT**

Bob Ross reported that we have 28 members including the new member, Google. 24 members have paid for 2019. As of June 1, 2019, he expects two members to be dropped. We have not made contact successfully with two companies. We are awaiting payment from two companies. We have \$13,335 cash flow for 2019 and a \$16,085 adjusted balance for 2019. We do expect a payment to be made soon for the European IBIS Summit of about \$1,650 (1,500 Euros).

For companies that have not yet paid member dues, if payments are made before June 17, 2019, company votes will count in the officer elections.

## **WEBSITE ADMINISTRATION**

Mike LaBonte reported that the Google logo was added to the member list. He reached out to SAE ITC to ask about their website work. They are not yet ready to move ahead on that.

Bob Ross noted that the tentative dates for the Asian IBIS Summits can be added to the website. Mike will add the dates to the website [AR].

## **MAILING LIST ADMINISTRATION**

Curtis Clark reported nothing new to report. There have been no new joins or drops.

## **LIBRARY UPDATE**

No update.

## **INTERNATIONAL/EXTERNAL ACTIVITIES**

### **- Conferences**

SPI2019 – the 23<sup>rd</sup> IEEE Workshop on Signal and Power Integrity will be held in Chambéry, France on June 18-21, 2019. An IBIS Summit will be held after the event. More information is available at:

<https://spi2019.sciencesconf.org/>

### **- Press Update**

Mike LaBonte noted he has planned to write an article for the Signal Integrity Journal on IBIS 7.0. He plans to get to this soon. Also, Eric Bogatin is interested in writing an article about Touchstone and what IBIS is doing with it.

### **- Related standards**

IEC 63055/IEEE 2401, JEITA “LPB”

Michael Mirmak reported the IEEE P2401 group had a meeting last night he was unable to attend. This was to approve draft 4 of the LPB specification. JEITA will spend the next half week doing final editing, then it will go up for a final working group vote of P2401 at the DAC meeting on June 3, 2019. After that, if the work group approves draft 4, there will be no more drafts to circulate. It will go to mandatory editorial review to scrub the document for eventual balloting in the wider IEEE.

## **SUMMIT PLANNING AND STATUS**

### **- IEEE SPI Summit**

SPI will be held in Chambéry, France on June 18-21, 2019. An IBIS Summit is planned in the afternoon of June 21, 2019. The conference will be held in Room B of Le Manège. Mentor and Zuken are sponsors. Bob Ross noted the third announcement was just sent out. We are seeking more presentations and participants. Michael Schaefer of Zuken is planning to lead

the meeting. Bob will reach out to several people for possible presentations.

#### - Asia Summits

Bob reported that we have proposed accepting one of the dates that JEITA had suggested for a room in Tokyo. November 8, 2019 is tentative for the Tokyo Summit date. We have checked and reserved, but not committed to dates, for Taipei on November 4, 2019 and Shanghai on November 1, 2019. We want to officially propose a vote for expenditures for the Shanghai and Taipei Summits not to exceed \$10,000, with sponsorship to cover some of the costs. For the Tokyo Summit, we could propose \$500 for a limit, although we don't normally have expenses for that. We need to make some preliminary payments for sites to hold the reservations.

Bob moved to schedule a vote for the Asian IBIS Summits with Shanghai on November 1, 2019 with costs not to exceed \$8,000, Taipei on November 4, 2019 with costs not to exceed \$8,000, and Tokyo on November 8, 2019 with costs not to exceed \$500. Lance Wang seconded the motion. There were no objections. Mike will send out a vote solicitation email [AR].

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. Discussion remains largely about parser development. The group has been answering questions from the parser developer, who is working on IBISCHK7. There was also a discussion about BIRD199. There was a recommendation to implement some type of warning, but not an error. Bob Ross noted it is not on the task list of the parser developer to deal with BIRD199. There needs to be a bug report before a change is decided upon.

The Quality task group checklist and other documentation can be found at:

[http://www.ibis.org/quality\\_wip/](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. The group discussed BIRD197 on the DC\_Offset parameter for IBIS-AMI models. They plan to decide next week on submitting a new version of the BIRD to the Open Forum.

Task group material can be found at:

[http://www.ibis.org/macromodel\\_wip/](http://www.ibis.org/macromodel_wip/)

### **INTERCONNECT TASK GROUP**

Michael Mirmak reported that the group meets at 8:00 a.m. PT on Wednesdays. The focus right now is on EMD, the successor to EBD. A draft has been circulated. Much of it uses BIRD189 Interconnect language and EBD language. There is also discussion of the need for an IBIS-ISS

parser including the development cost and scope. The Touchstone survey is closing today, so there will be discussion of the results in the next meeting. Mike LaBonte checked, and there were 87 responses so far.

Task group material can be found at:

[http://www.ibis.org/interconnect\\_wip/](http://www.ibis.org/interconnect_wip/)

## **EDITORIAL TASK GROUP**

Michael Mirmak reported the task group remains suspended. There have been suggestions that the group meet to discuss policy matters and procedures.

Task group material can be found at:

[http://www.ibis.org/editorial\\_wip/](http://www.ibis.org/editorial_wip/)

## **NEW ADMINISTRATIVE ISSUES**

- Annual election of officers

Radek Biernacki will send out the announcement today. He requested Bob Ross and Mike LaBonte to confirm receipt of the message. For two weeks, we will be in the period of candidate nominations. The first half of June will be the voting period. June 17, 2019 will be the announcement of results. Mike asked, regarding the nominations of officer positions, if anyone can make a nomination. Radek replied the nominated person must agree to accept the nomination. Only two officer positions require the person to be from a member company, chair and vice chair.

Bob noted most current officers will accept nominations for new positions. Bob nominated Randy Wolff for Chair. He stated officers can hold two positions. Radek noted all nominations should come by email. Mike thanked Radek for agreeing to be the returning officer.

- IBISCHK parser source code purchase price

Bob noted that at the last meeting we had a discussion and a motion was made and withdrawn. We need to create the parser license, and currently for IBISCHK 7.0.0 and any updates to it, we have traditionally charged a fixed price for a major release. The current price charged since IBISCHK4 has been \$2,500. The idea is that IBISCHK7.0.0 without any additional content can remain at \$2,500, or we can decide on a \$3,000 or higher price based on the new parser having substantially more content, mainly the Interconnect structure and referencing of files within directories. He asked if this is the time to recognize that the parser has more content and raise the source code price. Would we bring into IBISCHK IBIS-ISS parsing at some future release as well? That might justify a price increase.

Arpad Muranyi asked what the balances are with the parser development and the expected income from parser licenses purchases. Bob projects a positive balance. The issue is not the funding but the technical value of the parser. The urgency is that we embed the price in the license agreement. The more we delay, the less income we get. Bob projects 8 parser license sales this year. Radek Biernacki noted Bob mentioned previously having a different price for

renewal versus first time purchases. We might have another major improvement in EMD to either add to the IBISCHK7 parser or a Version 8.0 parser.

Mike stated we do not have a separate fund for the parser. We only loosely try to keep it as a self-sustaining expense item. Our account always has some positive balance at the end of the year. There is no rule that the license purchases must cover the full cost of development, so we could lower our overall account balance if we underfund development. The cost slowly goes up with maintaining checks for older specification versions on top of new checks added to the parser. If, between now and IBISCHK8, we add an IBIS-ISS parser and EMD checking, the price would go up and possibly double. We'd need to cover these costs without additional parser license purchasing. Looking at previous parser releases such as IBISCHK6.1, we haven't always voted to set the price. Bob noted the only vote would have occurred around the time of IBISCHK 6.0.

Bob moved to schedule a vote to increase the price of the parser license for IBISCHK7.x from \$2,500 to \$3,000. If the vote fails, the price would be set to \$2,500. Bob noted we do have a positive income over time from previous parser development, so we should be able to fund the cost of current development. Arpad Muranyi seconded the motion. There were no objections. Mike will send out a vote solicitation email [AR].

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

Mike LaBonte reported there has been email discussion on the BIRD. The authors intend to work on a BIRD update and submit it to the ATM task group for further comments.

#### **BIRD199: FIX RX\_RECEIVER\_SENSITIVITY INCONSISTENCIES**

Arpad Muranyi reported there were discussions regarding parser activity in the Quality task group. Arpad moved to schedule a vote on the BIRD. Bob Ross seconded the motion. He noted this BIRD would be part of IBIS 7.1, so there are no changes to the current version of the parser in development from this BIRD.

Arpad noted there were discussions of making checks retroactive to previous versions of IBIS from when this parameter was first introduced. Mike noted you would not make anything an error, since the parameter was defined differently in earlier versions. Bob added this is handled in the bug report. Arpad asked if the BIRD itself should mention the parser issues. Mike thought this should be avoided. There were no objections to the motion. Mike will send out a vote solicitation email [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.

## **BIRD197.2: NEW AMI RESERVED PARAMETER DC\_OFFSET**

Discussion was tabled.

## **IBISCHK PARSER AND BUG STATUS**

Bob Ross reported the developer is working on the parser, and the developer has asked for clarifications on several questions. One question was about referencing a Touchstone file directly or through a directory substructure through BIRD186. The answer was that the subdirectory structure applied to all referenced files. Also, a question was asked if we need to check that Model\_Specific Special\_Param\_Names parameters in the .ami file exist in the .ami file as Model\_Specific parameters. He answered yes.

Mike LaBonte asked when the parser is expected to be completed. Bob responded the agreement states June 21, 2019, but he is not holding him to this date. Mike noted it will take us some time after this to do additional checks and prepare the package for distribution. Arpad Muranyi asked if parser purchase details could be sent out sooner, so companies can prepare for the purchase. Bob will reach out to current owners of the IBISCHK6.1.5 parser to alert them [AR]. Mike noted we can't send an invoice yet, until at least the price is settled. Bob added we must receive the signed parser license agreement before distributing code.

Mike showed BUG203. Bob noted this bug has been discussed but not classified. Arpad thought our previous discussion determined that existing models should not be flagged as broken with an error message. Bob thought we should issue a caution message. Notes messages have been related to non-monotonic checks. A caution message requires an additional flag when running the parser. Mike showed that there are only two note messages in the parser. Lance Wang stated he wanted to see some message about this issue. Randy Wolff asked why we have notes versus cautions. Bob responded that the non-monotonic checks were creating large numbers of messages, so making them a note allowed tools to filter them out. Other checks were eventually classified as cautions to alert model developers without creating too many messages. Bob moved to classify the bug as enhancement severity, low priority, and open status, with a recommendation of a caution message. Arpad seconded the motion. There were no objections. Bob will update the bug report to note the caution message [AR].

BUG204 was submitted by Mike LaBonte and relates to Rx\_Receiver\_Sensitivity. Bob suggested a classification of annoying severity, low priority, and open status, and he is proposing a caution message. Once BIRD199 is implemented, for that IBIS version and beyond there will be an error. We could issue a warning message before the BIRD is implemented. Arpad suggested a caution message. He thought some tools might stop simulation if a warning is shown. Bob moved to classify the bug with annoying severity, low priority, and open status, with the recommendation of a caution message. Arpad seconded the motion. There were no objections. Bob will update the bug report to note the caution message [AR].

BUG 205 was submitted by the parser developer. For several AMI parameters, there is no error

reported if Usage is Out and Format is specified as Corner. Bob asked to classify it, because it is a specification violation, as severe severity, high priority, and open status. He thinks this should be an error for all IBIS versions 7.0 and earlier, but it could be a warning for versions earlier than 7.0. Arpad moved to make it an error for all versions of IBIS 7.0 or earlier with classification of severe severity, high priority, and open status. Bob seconded the motion. There were no objections. Bob will update the bug report with version applicability [AR].

## NEW TECHNICAL ISSUES

None.

## NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on June 7, 2019. A vote on the Asian IBIS Summits is scheduled. A vote on the IBISCHK7 parser license price is scheduled. A vote on BIRD199 is scheduled. The following teleconference meeting is tentatively scheduled for June 28, 2019.

Curtis Clark moved to adjourn. Arpad Muranyi 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](mailto: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](mailto:ibis@freelists.org) and/or [ibis-users@freelists.org](mailto:ibis-users@freelists.org) email lists (formerly [ibis@eda.org](mailto:ibis@eda.org) and [ibis-users@eda.org](mailto:ibis-users@eda.org)).
- To subscribe to one of the task group email lists: [ibis-macro@freelists.org](mailto:ibis-macro@freelists.org), [ibis-interconn@freelists.org](mailto:ibis-interconn@freelists.org), or [ibis-quality@freelists.org](mailto:ibis-quality@freelists.org).
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: `ibischk6`, `tschk2`, `icmchk1`, `s2ibis`, `s2ibis2` and `s2iptl`.

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](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	March 15,	April 5,	April 26,	May 17,
			2019	2019	2019	2019
ANSYS	User	Active	X	X	-	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Inactive	-	-	X	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
GLOBALFOUNDRIES	Producer	Inactive	-	-	-	-
Google	User	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
IBM	Producer	Active	X	X	X	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Inactive	-	-	-	-
Keysight Technologies	User	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	X	-	-	-
Raytheon	User	Inactive	-	-	-	-
SiSoft	User	Active	X	X	X	X
SPISim	User	Inactive	-	-	-	X
Synopsys	User	Inactive	X	-	-	-
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-	-	-	-
ZTE Corp.	User	Inactive	-	-	-	-
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

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.