



## IBIS Open Forum Minutes

Meeting Date: **March 15, 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
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 Mahmood
GLOBALFOUNDRIES	Steve Parker
Huawei Technologies	Antonio Ciccomancini
Futurewei Technologies	Albert Baek
IBM	Michael Cohen*, Greg Edlund
Infineon Technologies AG	Anke Sauerbrey
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  
Zuken USA

(Michael Schaefer)  
Lance Wang

### **OTHER PARTICIPANTS IN 2019**

Apollo Giken Co.	Satoshi Endo
Google	Zhiping Yang, Songping Wu
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
April 5, 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.

## **INTRODUCTIONS AND MEETING QUORUM**

Randy Wolff declared that a quorum was reached.

There were three new participants. Atsushi Tomishima from Toshiba Electronic Devices and Storage Corporation introduced himself. Megumi Ono from Socionext introduced herself. Kazuki Murata from Ricoh introduced himself. He is also a member of JEITA.

## **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 February 22, 2019 IBIS Open Forum teleconference. Bob Ross moved to approve all the minutes. Arpad Muranyi seconded the motion. There were no objections.

Mike reviewed ARs from the previous meeting.

1. Bob Ross to contact representatives of member companies with recent status changes about logos [AR].  
Bob reported the logo is updated for Dassault Systemes. He is still inquiring what GLOBALFOUNDRIES wants to be referred to.
2. Mike to send email solicitation for SPI Summit vote [AR].  
Mike reported this as done.
3. Mike to send email solicitation for IBIS 7.0 vote [AR].  
Mike reported this as done.
4. Mike to produce BIRD197.2 document with change markup [AR].  
Mike reported the BIRD had all markup removed. He produced a change document and posted it.

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

Mike noted BIRD198 will be a new BIRD for discussion during the meeting.

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

Bob Ross reported that we have 26 members. 15 members have paid for 2019. He will ping several people to remind them that their payment is due. We have a \$4,671 cash flow for 2019 and a \$7,421 adjusted balance for 2019. The 2018 books are closed. There was \$11,588 cash flow and an adjusted balance of \$8,838. There was a charge on order of \$8,000 for support from SAE-ITC in 2018.

## **WEBSITE ADMINISTRATION**

Mike LaBonte reported changing the CST logo to Dassault Systemes. He is also creating

secure upload/download areas for storage and distribution of files such as source code packages and contracts for Bob Ross to use.

Mike previously reported a new website shown by SAE ITC, but no new meetings have happened related to this.

### **MAILING LIST ADMINISTRATION**

Curtis Clark reported everything is going fine. There was a net positive in terms of subscribers after some drops and joins.

### **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

None.

- Related standards

IEC 63055/IEEE 2401, JEITA “LPB”

Michael Mirmak reported that the coming Monday afternoon, the IEEE P2401 group will meet to talk about the current draft 2 of LPB, hold a vote on approving draft 2, and starting work on draft 3.

### **SUMMIT PLANNING AND STATUS**

-IEEE SPI Summit

SPI will be held in Chambéry, France on June 18-21, 2019. Mike LaBonte noted we have been contacted by the chair, Mihai Telescu, about hosting an IBIS event.

Bob Ross moved to vote to hold an IBIS Summit on June 21, 2019 at SPI with expenses not to exceed \$2,800. Bob noted that 1,500 Euros is required for IBIS sponsorship of the event. Randy Wolff seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

IBM – abstain

Intel – yes  
Keysight – yes  
Mentor – yes  
Micron – yes  
NXP – yes (by email)  
SiSoft – yes  
SPISim – yes  
Synopsys – yes  
Teraspeed Labs – yes  
Zuken – yes (by email)

The roll call vote concluded with a vote tally of Yes – 11, No – 0, Abstain – 1. 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. The agenda is related to the IBISCHK parser. There has been discussion relative to IBISCHK7.

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 last meeting was cancelled. Recent discussion was a C\_comp improvement BIRD and a new BIRD to clarify the Rx\_Receiver\_Sensitivity parameter. This BIRD will be finalized and submitted after the IBIS 7.0 specification approval.

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 usually meets at 8:00 a.m. PT on Wednesdays. The group has been suspended until IBIS 7.0 work was concluded. The meetings may resume next week.

Task group material can be found at:

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

## **EDITORIAL TASK GROUP**

Michael Mirmak mentioned the idea of potentially making Editorial a weekly meeting to address the IBIS 7.0 known issues list. This would help to prepare the next IBIS version to include necessary fixes.

Task group material can be found at:

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

## **NEW ADMINISTRATIVE ISSUES**

- IBIS 7.0 draft 3 status review

Michael Mirmak reported there has been only minor editorial and typographical comments received. There are some pagination issues to correct, and another comment to address about a missing comma. No other additional issues outside of the known issues document have been raised. Mike LaBonte showed where a comma needs to change to a period on page 200. Bob Ross noted this is a minor editorial issue, so we can accept a vote with the change. Bob added that a page break should also be inserted on page 26 before the [End] keyword. The Draft 3 note on the cover page will need to be removed too.

Michael Mirmak moved to vote to approve the draft 3 document with the noted changes as the official IBIS 7.0 specification. Walter Katz seconded the motion. There were no objections.

The roll call vote tally was:

ANSYS – yes

IBM – yes

Intel – yes

Keysight – yes

Mentor – yes

Micron – yes

SiSoft – yes

SPISim – yes

Synopsys – yes

Teraspeed Labs – yes

Zuken – yes (by email)

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

Mike thanked everyone that worked on the content in the new specification. Bob Ross noted the edits should be made and checked by the Editorial task group. Michael Mirmak will make the changes [AR]. Michael asked if there would be a press release. Mike responded that SAE ITC said they would like to do a press release. Mike asked Michael to help draft the press release. Mike noted Signal Integrity Journal would also like an article. Mike has agreed to write an article for the journal. Walter Katz noted an email for the SI-list would be appropriate. Mike

plans to do this as well.

- IBIS officer election notice

Mike LaBonte noted that officer election nominations will open May 17, 2019. The voting period is June 1 – June 17, 2019. Mike announced that he will not be running for another term as IBIS chair. There will need to be some changes to the officers this year.

Bob asked about nominating the returning officer. Radek Biernacki thought we could wait until a future meeting to discuss this.

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

Murata-san introduced the BIRD. The BIRD came out of SI/PI/EMI discussions in JEITA. The concept was introduced at the DesignCon IBIS Summit by Megumi Ono. The BIRD introduces a new keyword [PDN Pin Mapping] that contains similar content as [Series Pin Mapping]. A new [Model] type is PDN. This is for an on-die PDN model described by new keywords under [Model]. These keywords describe a simple on-die PDN network with on-die decoupling capacitance, series resistance, and leakage resistance.

This BIRD was created because model users have trouble getting the on-die decoupling models for simulation. It is desired for there to be an easy way in IBIS to include the on-die decoupling model. Murata-san noted a presentation from 2011 by Lance Wang and Randy Wolff introducing a method to include on-die decoupling models using series element keywords. This method is not an obvious way to include an on-die decoupling model.

Mike LaBonte asked how [C pdn] is different from [C pdn corner]. Murata-san noted this is like use of [C Comp Corner] to show values in numerical order in one case but also in an order specific to the simulation corner in the second case. Arpad Muranyi noted that there is new BIRD189 syntax that allows for circuits describing on-die decoupling circuits to be included. He questioned if this proposal is necessary given the new method included in IBIS 7.0.

Mike noted that it is common for further discussion on BIRDS to move to one of the task groups. Walter Katz suggested moving the discussion to the ATM task group. Arpad Muranyi plans to add this topic to the next ATM task group agenda. Mike plans to contact the BIRD authors after further ATM task group discussion to schedule future meeting times for discussion that are better for the BIRD authors to attend. Randy Wolff noted a common meeting time for his company is 5:00 pm Mountain time, which is 9:00 am in Japan.

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

Walter Katz moved to schedule a vote on BIRD197.2 for the next meeting. Randy Wolff seconded the motion. There were no objections. Mike LaBonte will send an email notice for vote solicitation [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.

## **IBISCHK PARSER AND BUG STATUS**

Bob Ross noted the IBISCHK bug directory has been updated to show all but one bug closed in the IBISCHK 6.1.5 parser update. Mike noted for BUG202, it is unclear how to address this bug. Bob responded that the resolution may be that it will not be fixed. There is a workaround for the bug. Wei-hsing Huang noted it is an issue with the compiler used.

Bob reported he got a quote from the parser developer for \$8,000 for IBISCHK7 development.

Walter Katz moved to schedule a vote on development of the IBISCHK7 parser with expenses up to \$8,000. Michael Mirmak seconded the motion. There were no objections. Mike LaBonte will send an email notice for vote solicitation [AR].

Michael asked if IBIS-ISS parsing was excluded from the parser development. Bob responded this is correct. Radek Biernacki asked if the presence of IBIS-ISS files was checked for. Mike will check that the parser contract contains this language [AR].

Michael noted he is interested in a parser check for IBIS-ISS, but this is a significant development effort. Bob thought this could be a separate project. Mike noted we have a separate parser for Touchstone files. Walter commented most EDA tools have internal SPICE parsers. Michael added he would like to see a separate parser that is not part of a commercial tool. Randy Wolff agreed that there would be a lot of value for model developers.

Walter noted that there are two types of parsers for SPICE syntax. One checks valid syntax and the other checks valid connectivity. Randy added the parallel to IBISCHK is that it checks for valid syntax, but you can still create a model with bad data. Walter asked Bob to check with the parser developer to get an idea of cost to develop a syntax checker for IBIS-ISS. Mike thought a parser development could be specified by the Quality task group before asking for a quote. Mike will discuss this in the Quality task group [AR].

Radek asked Bob if he had a schedule for development of the IBISCHK7 parser. Bob thought July might be the earliest for a parser release.

## **NEW TECHNICAL ISSUES**

Michael Mirmak noted some questions about the Tap type for a tapped delay line. The example (in section 10.11.1) says the parameter takes on floating point values. The names of the taps are strings, but they are not shown as strings surrounded by quotes in examples. Radek Biernacki and Walter Katz agreed that the syntax in the examples is correct, forming a node name in the tree. Michael noted it is a special case, since the tap name is restricted to be a



number, but it is not clearly stated if there are restrictions on how to write the tap name. Walter noted that fractional taps would be an exception that is not specified.

## NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on April 5, 2019. A vote on BIRD197.2 is scheduled. A vote on development of the IBISCHK7 parser is scheduled. The following teleconference meeting is tentatively scheduled for April 26, 2019.

Arpad Muranyi moved to adjourn. Ted Mido seconded the motion. The meeting adjourned.

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## NOTES

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This meeting was conducted in accordance with ANSI guidance.

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 `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](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/bugspl.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	January	February 1,	February 22,	March 15,
			11, 2019	2019	2019	2019
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Inactive	X	X	-	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	X	-	-
Ericsson	Producer	Inactive	-	X	-	-
GLOBALFOUNDRIES	Producer	Active	X	X	X	-
Huawei Technologies	Producer	Inactive	-	X	-	-
IBM	Producer	Active	X	X	X	X
Infineon Technologies AG	Producer	Inactive	-	X	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Inactive	X	-	-	-
Keysight Technologies	User	Active	X	X	X	X
Maxim Integrated	Producer	Inactive	-	X	-	-
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	Active	-	X	X	-
Synopsys	User	Active	X	X	-	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-	X	-	-
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.