



IBIS Open Forum Minutes

Meeting Date: **April 21, 2017**

Meeting Location: **Teleconference**

VOTING MEMBERS AND 2017 PARTICIPANTS

ANSYS	Curtis Clark, Toru Watanabe
Applied Simulation Technology	(Fred Balistreri)
Broadcom	Bob Miller*
Cadence Design Systems	Brad Brim*, Sivaram Chillarige, Debabrata Das Ambrish Varma
Cisco Systems	(Bidyut Sen)
CST	Stefan Paret, Matthias Troescher
Ericsson	Zilwan Mahmod
GLOBALFOUNDRIES	Steve Parker*
Huawei Technologies	(Jinjun Li)
IBM	Luis Armenta*, Adge Hawes*, Greg Edlund
Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Michael Mirmak*, Hsinho Wu*, Eddie Frie Gianni Signorini, Barry Grquinovic
IO Methodology	Lance Wang*
Keysight Technologies	Radek Biernacki*, Pegah Alavi, Fangyi Rao Stephen Slater, Jian Yang
Maxim Integrated	Joe Engert, Don Greer, Yan Liang, Hock Seow
Mentor, A Siemens Business (formerly Mentor Graphics)	Arpad Muranyi*, Nitin Bhagwath, Praveen Anmula Fadi Deek, Raj Raghuram, Dmitry Smirnov Bruce Yuan
Micron Technology	Randy Wolff, Justin Butterfield
Qualcomm	Tim Michalka, Kevin Roselle
Raytheon	Joseph Aday
Signal Integrity Software	Mike LaBonte, Walter Katz*, Todd Westerhoff
Synopsys	Kevin Li*, Ted Mido*, John Ellis, Scott Wedge
Teraspeed Labs	Bob Ross*
Xilinx	(Raymond Anderson)
ZTE Corporation	(Shunlin Zhu)
Zuken	Ralf Bruening

OTHER PARTICIPANTS IN 2017

Accton	Raul Lozano
ASUS	Nick Huang, Bin-chyi Tseng
eASIC	David Banas

Extreme Networks	Bob Haller
Independent	Dian Yang
John Baprawski, Inc.	John Baprawski
KEI Systems	Shinichi Maeda
Lattice Semiconductor	Maryam Shahbazi, Dinh Tran
SAE International	(Logen Johnson)
Signal Metrics	Ron Olisar
SPISim	Wei-hsing Huang
Toshiba	Yasuki Torigoshi

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
May 10, 2017	European IBIS Summit at SPI – no teleconference	
May 12, 2017	624 999 876	IBISfriday11

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

<http://tinyurl.com/zeulerr>

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

Michael Mirmak declared that a quorum was reached and the meeting could begin. Michael led the meeting in the absence of Mike LaBonte. Meeting minutes were taken by Bob Ross in the absence of Randy Wolff.

CALL FOR PATENTS

Michael Mirmak 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

Bob Ross called for comments on the minutes of the March 31, 2017 IBIS Open Forum teleconference. With no comments, Walter Katz moved to approve the minutes. Arpad Muranyi seconded the motion. There were no objections.

There were no ARs to review.

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS

Bob Ross added a discussion on the next Version of IBIS and its release number. Michael Mirmak will add this item before the Technical Discussion section.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that we have 25 total members with 17 paid memberships for 2017. Our account balance is at \$13,924 for 2017. Actual cash flow of \$12,174 has been collected in 2017. We expect more income and payments for the European IBIS Summit and membership dues.

The 2016 figures are reduced to an account balance of \$17,832 and cash flow of \$15,271 due to SAE charges to IBIS of \$2,114 for miscellaneous items. We had 22 members in 2016.

WEBSITE ADMINISTRATION

Michael Mirmak received a report from Mike LaBonte. An ibischk6 broken link reported by Curtis Clark has been fixed. The Mentor, A Siemens Business logo has been updated. A new known issue reported by Curtis Clark has been added to the ver6_1_know_issues.docx list. The Upcoming Events page for the European IBIS Summit has been updated with room number and a new sponsor.

MAILING LIST ADMINISTRATION

Michael Mirmak reported for Curtis Clark that everything is normal.

LIBRARY UPDATE

No update.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

SPI2017 – the 21st IEEE Workshop on Signal and Power Integrity will be held in Baveno, Italy on May 7-10, 2017. An IBIS Summit will be held after the event. More information is available at:

<http://www.spi2017.org/>

EDI CON – Electronic Design Innovation Conference & Exhibition will be held in Boston, MA on

September 11-13, 2017. A Summit at this event is under consideration. More information is available at:

<http://www.ediconusa.com>

EPEPS – The 26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems will be held in San Jose, CA on October 15-18, 2017. A Summit at this event is under consideration. More information is available at:

<http://www.epeps.org/>

- Press Update
None.

- Related standards
None.

SUMMIT PLANNING AND STATUS

- SPI 2017 IBIS Summit

The European IBIS Summit at SPI will be held on Wednesday afternoon, May 10, 2017. Bob Ross reported that five presentations are planned. Zuken will be managing the event onsite. The fourth announcement was sent this week and the agenda will be sent out later. ANSYS, CST, Mentor, A Siemen Business, and Zuken are official sponsors.

- EDI CON

EDI CON will be held in Boston, MA on September 11-13, 2017. The organizers previously have been involved with our main conference, DesignCon in the past and have invited IBIS to hold a Summit. Brad Brim clarified that EDI CON is privately sponsored by Microwave Journal and Signal Integrity Journal and is not affiliated with DesignCon. Bob Ross stated that the Board has been in contact with the EDI CON organizers, and this would be an opportunity for people in the Boston area to hold a Summit. Three IBIS board members would probably help organize a Summit and attend. Some details would still have to be decided (what day, full day or half day, etc.).

Bob moved to hold a vote at the next IBIS teleconference to hold a Summit at a date to be determined with a cost that would not exceed \$3,000. Lance Wang seconded the motion. With no objections, the motion carried.

- EPEPS

EPEPS will be held in San Jose, CA on October 15-18, 2017. Bob Ross suggested that we hold an IBIS Summit on Wednesday afternoon, October 18, 2017. We had a successful meeting two years ago with many people from Silicon Valley attending. While this is extra work, both Bob and Michael Mirmak would plan to attend.

Bob moved to hold a vote at the next IBIS teleconference to hold a Summit on October 18, 2017 with a cost that would not exceed \$3,000. Radek Biernacki seconded the motion. With no objections, and the motion carried.

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

Bob Ross reported that the group is meeting on Tuesdays at 8:00 a.m. PT. Several meetings were cancelled, but the group has discussed BUG reports and the next parser release.

The IBISCHK6 user guide work in progress can be reviewed at:

http://www.ibis.org/ibischk6/ibischk_6.1.3_UserGuide_wip1.pdf

The Quality Task Group checklist and other documentation can be found at:

http://www.ibis.org/quality_wip/

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that the group is meeting regularly on Tuesdays at 12:00 p.m. PT. The group has been discussing BIRD158.4, BIRD161.1, and pending BIRD186.3.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

Michael Mirmak reported that the group is meeting on Wednesdays at 8:00 a.m. PT. BIRD189.2 was reviewed and issued to the IBIS Open Forum. Meetings are suspended unless more work is needed.

Task group material can be found at:

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

EDITORIAL TASK GROUP

Michael Mirmak reported that meetings take place at 8:00 a.m. PT on Fridays that the IBIS Open Forum does not meet. The group considered the content of a Version 7.0 release.

Task group material can be found at:

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

NEW ADMINISTRATIVE ISSUES

- Second revision of IBIS Policies and Procedures

Bob Ross reported that Mike LaBonte has been in contact with SAE regarding legal review. The board also had a good meeting with our new contact, Tom Munns (replacing Logen Johnson) and discussed legal reviews and how IBIS handles and documents financial matters.

The Policy and Procedures document can be found at:

<http://www.ibis.org/policies/>

- Next IBIS version number

Based on Editorial Task Group discussions, Walter Katz moved and Bob Ross seconded this motion:

“It is the sense of the IBIS Open Forum that the next version of IBIS shall be 7.0.”

Michael Mirmak had originally suggested this motion because there would be significant technical additions to IBIS. Without objection, the motion carried.

This release will contain substantial technical improvements. Walter showed a slide listing the approved BIRDs and pending BIRDs for this release:

189 Interconnect Modeling Using IBIS-ISS and Touchstone	Pending
188 Expanded Rx Noise Support for AMI	
187 Format and Usage Out Clarifications	Pending
186 File Naming Rules	Pending
185 Section 3 Reserved Word Guideline Update	
184 Model_name and Signal_name Restriction for POWER and GND Pins	
183 [Model Data] Matrix Subparameter Terminology Correction	
182 POWER and GND [Pin] signal_name as [Pin Mapping] bus_label	
180 Require Unique Pin Names in [Pin]	
179 New IBIS-AMI Reserved Parameter Special_Param_Names	
166 Resolving Problems with Redriver_Init Flow	Pending
158 AMI Ts4file Analog Buffer Models	Pending
147 Back-Channel Support	

Bob indicated that BIRD166 is still being discussed. An alternative BIRD for re-driver flow could be issued. Walter commented that BIRD181 for I-V Table Clarifications is not included, but would be scheduled for a later release. Michael noted, and Bob agreed that we will need a new parser license and parser funding. Bob asked companies to plan for new license payments in their 2018 budgets.

BIRD158.4: AMI TS4FILE ANALOG BUFFER MODELS

Walter Katz introduced BIRD158.4. Radek Biernacki noted that the shortcut to link to 4-port Touchstone files is limited to IBIS-AMI applications. Bob Ross noted that the example for the new parameter, Ts4file_Includes is incorrect. (It was copied from the Ts4file example.) BIRD158.5 with a corrected example will be issued next week.

Walter Katz moved that BIRD158.5 be scheduled for a vote at the next teleconference. Bob Ross seconded the motion. There were no objections and the motion carried.

BIRD166.1: RESOLVING PROBLEMS WITH REDRIVER INIT FLOW

Walter Katz introduced BIRD166.1 and illustrated the flow improvements suggested in the April 4, 2017 presentation on Redriver Flow:

http://www.ibis.org/atm_wip/archive/20170404/walterkatz/BIRD%20166%20Redriver%20Flow/BIRD166.pptx

BIRD166.1 is limited to redriver flows, and the current IBIS Version 6.1 redriver flow is broken.

Bob Ross and Radek Biernacki noted that there is still some technical debate. An alternative proposal would include two additional Tx outputs. Bob suggested that the discussion continue in the ATM Task Group to see if we can reach agreement on whether to move forward on BIRD166.1, consider a more general alternative BIRD, or to postpone the resolution to a future release.

BIRD186.2: FILE NAMING RULES

Although BIRD186.2 was the most recent uploaded version, Walter Katz introduced pending BIRD186.3 with several significant changes and discussed the following terms and character limits. From the pending BIRD186.3 text:

A “file name” may not be a directory. The “file name” has three sections, “path name” (optional), “base name” and “extension name” (characters following the last “.” in “file name”). The number of characters in the combined “base name” and “extension name” shall not exceed sixty-four (64) characters. The number of characters in “path name” shall not exceed sixty-four (64) characters.

Definitions:

“path name” The path of a “file name” in any file reference in a parent file relative to the location of the parent file.

“full path name” The path of a file in any file reference in a parent file which itself is referenced by a file referenced by an IBIS file, relative to the location of the IBIS file. There can be many levels of referenced files.

“absolute path name” The path of a file relative to the root of the file system directory.

The model maker should be aware that excessive nesting of file paths may result in “absolute path names” that are longer than a 260-character hard limit on Windows file systems.

Bob Ross suggested replacing <filename> with <base name> in several locations in the Version 6.1 document in the Package Modeling and Electrical Board Descriptions sections. Currently, <filename>.pkg and <filename.ebd> are used to describe the embedded names of .pkg and

.ebd files that are documented by the [File Name] keywords. This change would avoid confusion with the proposed definitions. (Also, <package_file_name>.pkg would be corrected to <base name>.pkg.) Bob will provide the suggested additions for BIRD186.3.

Bob also noted that on page 192, the number of characters in each line of an IBIS_AMI file is unlimited. This contradicts item 4 in section 3 that limits the number of characters to 1024. Bob will suggest that the corrections be added to BIRD186.3 before posting. Because there is some confusion, the pending BIRD186.3 should be discussed in the ATM Task Group meeting.

BIRD189.2: INTERCONNECT MODELING USING IBIS-ISS AND TOUCHSTONE

Michael Mirmak introduce BIRD189.2 and noted these changes:

On page 24, the table heading capitalization is change to Aggressor_Only to match its usage in all other areas. This heading is the optional reserved word to be used in the fifth column.

The Terminal_type names were changed so the “buffer” is spelled as in other pending BIRD(s): Buf → Buffer for Buffer_I/O and Buffer_Rail throughout.

A clarifying note is added on page 21 that states that “I/O” in this context is a synonym for “signal”, as opposed to “supply”; it is not intended to imply model type as used in the “Model_type subparameter.

Bob Ross noted that <filename>.ims exists on page 15 when referring to the embedded name that would be called by the [File Name] keyword. <filename> should be changed to <base name> in a future BIRD189.3 for consistency with pending BIRD185.3.

BIRD187.3: FORMAT AND USAGE OUT CLARIFICATIONS

Michael Mirmak showed BIRD187.3. Because there were no changes or comments since the last meeting, Bob Ross moved to vote on BIRD187.3. Walter Katz seconded the motion. There were no objections.

Bob provided the email votes submitted from non-attendees. Then the roll call vote tally was:

ANSYS – yes (by email)
Broadcom - yes
Cadence Design Systems – yes
GLOBAL FOUNDARIES – yes
IBM – yes
Intel Corporation – yes
IO Methodology – yes
Keysight Technologies – yes
Mentor, A Siemens Business – yes
Micron Technology – yes (by email)
Signal Integrity Software – yes
Synopsys – yes

Teraspeed Labs – yes

The roll call vote concluded with a vote tally of Yes – 13, No – 0, Abstain – 0. The motion passed, and BIRD187.3 was accepted.

BIRD125.1: MAKE IBIS-ISS AVAILABLE FOR IBIS PACKAGE MODELING

Discussion was tabled.

BIRD145.3: CASCADING IBIS I/O BUFFERS WITH [EXTERNAL CIRCUIT]S USING THE [MODEL CALL] KEYWORD

Discussion was tabled.

BIRD161.1: SUPPORTING INCOMPLETE AND BUFFER-ONLY [COMPONENT] DESCRIPTIONS

Discussion was tabled.

BIRD163: INSTANTIATING AND CONNECTING [EXTERNAL CIRCUIT] PACKAGE MODELS WITH [CIRCUIT CALL]

Discussion was tabled.

BIRD164: ALLOWING PACKAGE MODELS TO BE DEFINED IN [EXTERNAL CIRCUIT]

Discussion was tabled.

BIRD165: PARAMETER PASSING IMPROVEMENTS FOR [EXTERNAL CIRCUIT]S

Discussion was tabled.

BIRD181.1: I-V TABLE CLARIFICATIONS

Discussion was tabled.

IBISCHK6 PARSER AND BUG STATUS

Bob Ross reported that he got a development estimate for fixing BUGs181-189 of \$650. Michael Mirmak questioned whether BUG182 should be fixed because allowing paths in file name calls will be legal in IBIS Version 7.0. Bob responded that this is a BUG in Version 6.1 of IBIS and should be fixed in a Version 6.1.4 parser that checks IBIS Version 6.1. A Version 7.0.0 parser for a pending Version 7.0 release would relax this restriction.

Bob Ross moved that IBIS approve paying the parser developer \$650.00 for ibischk6 Version 6.1.4 development work. Brad Brim seconded the motion.

The roll call tally was:

Broadcom – yes
Cadence Design Systems – yes
GLOBAL FOUNDARIES – yes
IBM – yes
Intel Corporation – yes
IO Methodology – yes
Keysight Technologies – yes
Mentor, A Siemens Business – yes
Signal Integrity Software – yes
Synopsys – yes
Teraspeed Labs – yes

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

NEW TECHNICAL ISSUES

None.

NEXT MEETING

The European IBIS Summit at SPI will be held May 10, 2017. No teleconference will be available. The next IBIS Open Forum teleconference meeting will be held May 12, 2017. Votes on BIRD158.5 and BIRD186.3 are scheduled. Votes on conducting IBIS Summits at EDI CON and EPEPS also are scheduled.

The following IBIS Open Forum teleconference meeting is tentatively scheduled on June 2, 2017.

Walter Katz moved to adjourn. Arpad Muranyi seconded. The meeting adjourned.

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NOTES

IBIS CHAIR: Mike LaBonte

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This meeting was conducted in accordance with ANSI guidance.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.
- To subscribe to the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org).
- To subscribe to one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, or ibis-quality@freelists.org.
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.

- To report bugs or request enhancements to the free software tools: ibischk6, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for ibischk resides along with reported BUGs at:

<http://www.ibis.org/bugs/ibischk/>
<http://www.ibis.org/bugs/ibischk/bugform.txt>

The BUG Report Form for tschk2 resides along with reported BUGs at:

<http://www.ibis.org/bugs/tschk/>
<http://www.ibis.org/bugs/tschk/bugform.txt>

The BUG Report Form for icmchk resides along with reported BUGs at:

<http://www.ibis.org/bugs/icmchk/>
http://www.ibis.org/bugs/icmchk/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

<http://www.ibis.org/bugs/s2ibis/bugs2i.txt>
<http://www.ibis.org/bugs/s2ibis2/bugs2i2.txt>
<http://www.ibis.org/bugs/s2iplt/bugsplt.txt>

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

<http://www.ibis.org/>

Check the IBIS file directory on ibis.org for more information on previous discussions and results:

<http://www.ibis.org/directory.html>

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

SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	February 17, 2017	March 10, 2017	March 31, 2017	April 21, 2017
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	X	-	X
Cadence Design Systems	User	Active	X	X	X	X
Cisco Systems	User	Inactive	-	-	-	-
CST	User	Inactive	-	-	-	-
Ericsson	Producer	Inactive	-	-	-	-
GLOBALFOUNDRIES	Producer	Active	X	X	-	X
Huawei Technologies	Producer	Inactive	-	-	-	-
IBM	Producer	Active	X	X	X	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Active	X	X	X	X
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
Qualcomm	Producer	Inactive	-	-	-	-
Raytheon	User	Inactive	-	-	-	-
Signal Integrity Software	User	Active	X	X	X	X
Synopsys	User	Active	-	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-	-	-	-
ZTE	User	Inactive	-	-	-	-
Zuken	User	Inactive	-	-	-	-

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.