



IBIS Open Forum Minutes

Meeting Date: **February 19, 2021**

Meeting Location: **Teleconference**

VOTING MEMBERS AND 2021 PARTICIPANTS

| | |
|-------------------------------|----------------------------------|
| ANSYS | Curtis Clark* |
| Applied Simulation Technology | (Fred Balistreri) |
| Broadcom | (Yunong Gan) |
| Cadence Design Systems | Zhen Mu* |
| Cisco Systems | (Stephen Searce) |
| Dassault Systemes (CST) | (Stefan Paret) |
| Ericsson | (Guohau Wang) |
| Google | Zhiping Yang* |
| Huawei Technologies | (Hang (Paul) Yan) |
| IBM | (Juan Martinez) |
| Infineon Technologies AG | (Christian Sporrer) |
| Instituto de Telecomunicações | (Abdelgader Abdalla) |
| Intel Corporation | Hsinho Wu*, Michael Mirmak* |
| Keysight Technologies | Radek Biernacki*, Fangyi Rao* |
| Marvell | Steve Parker* |
| Maxim Integrated | Tushar Pandey |
| Mentor, A Siemens Business | Arpad Muranyi* |
| Micron Technology | Randy Wolff*, Justin Butterfield |
| MST EMC Lab | (Chulsoon Hwang) |
| NXP | (John Burnett) |
| SerDesDesign.com | (John Baprawski) |
| SiSoft (MathWorks) | Mike LaBonte*, Walter Katz* |
| Synopsys | Ted Mido* |
| Teraspeed Labs | Bob Ross* |
| Xilinx | (Romi Mayder) |
| ZTE Corporation | (Shunlin Zhu) |
| Zuken | (Michael Schäder) |
| Zuken USA | Lance Wang* |

OTHER PARTICIPANTS IN 2021

Achronix Semiconductor Hansel Dsilva*

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 connection information for future IBIS teleconferences is as follows:

<https://tinyurl.com/IBISOFridayTeams>

Join Microsoft Teams Meeting

Conference ID: 803 509 041#

[Local numbers](#) | [Learn more about Teams](#) | [Meeting options](#)

Join with a video conferencing device

106010980@teams.bjn.vc VTC Conference ID: 1143484747

[Alternate VTC dialing instructions](#)

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 January 29, 2021 IBIS Open Forum teleconference. Mike LaBonte moved to approve the minutes. Radek Biernacki seconded the motion. There were no objections.

Randy reviewed ARs from the previous meeting.

1. Steve Parker to add link to ezAMI to the Free Tools webpage [AR].
Steve reported that this had been done.
2. Steve Parker to update the EMC+SIPI and DesignCon dates on the Summits webpage [AR].
Steve reported that this had been done.
3. Randy Wolff to report on the board meeting with SAE ITC [AR].
Randy reported that the meeting with SAE ITC had occurred. His report is in the New Administrative Issues section below.

4. Bob Ross to update the classification status of TSCHK2 BUG4 on the website [AR].
Bob reported that this had been done.

ANNOUNCEMENTS, CALL FOR ADDITIONAL AGENDA ITEMS

Randy Wolff noted that a new BIRD, BIRD210, had been submitted and would be discussed.

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that we have 27 members. The quorum for meetings is 7. Cash flow for 2021 is \$6,525 and total adjusted balance for 2021 is \$9,875. Adjustments stem from a full membership that was double paid in 2020, so the second payment was applied to 2021, a half membership from 2020 that was applied to 2021 after the half-price academic membership was established, and a China Summit sponsorship that was moved to 2021 when the 2020 summit became virtual.

Bob noted that we are still waiting for a deduction for SAE ITC 2020 Extra Charges. Last year this charge was over \$10,000. He said we also expect a new membership payment in 2021, and we expect a new Touchstone parser source code license payment in 2021 as well. All current member organizations should now have received an invoice for 2021 membership. Current 2020 memberships will expire in May of 2021 if payment is not received by then. Bob reported that 10 members have paid for 2021, and it may be 11 depending on whether the sponsorship payment forwarded from 2020 will be converted to dues for 2021.

Bob noted that he had prepared a first cut at a 2021 expense budget, but there are some large expenditures that are uncertain because of possible virtual summits, various ibischk parser development proposals, and the potential release of a new version of IBIS.

WEBSITE ADMINISTRATION

Steve Parker reported that the website was up to date with respect to task groups' minutes and documents. Steve said that he had added a link to the ezAMI tool to the Free Tools webpage. Steve noted that he had removed the link to free SPISim tools at the request of the developer, as SPISim's IP had been acquired by Ansys.

MAILING LIST ADMINISTRATION

Mike LaBonte reported that mailing lists were generally operating smoothly. He noted that several weeks ago Randy Wolff and Justin Butterfield had sent emails that were rejected by freelists.org as though they weren't subscribed. Mike had contacted freelists. They reported that the issue was caused by a recent code change they had made, and they corrected the problem.

LIBRARY UPDATE

Zhiping Yang reported no new updates to the model library. He said there had been no new contacts from any model providers.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

SPI2021 – the 25th IEEE Workshop on Signal and Power Integrity (virtual May 10-12, 2021) :

<https://spi2021.uni-siegen.de>

IEEE EMC + SIPI Symposium 2021 (virtual from July 27-August 13, 2021):

<https://www.emc2021.emcss.org>

DesignCon 2021 (August 16-18, 2021, San Jose, CA):

<https://www.designcon.com/>

- Press Update

None.

- Related standards

None.

SUMMIT PLANNING AND STATUS

- SPI 2021 (May 10-12, 2021 entirely virtual)

Bob Ross said the IBIS officers had agreed to propose that the IBIS summit be held on Wednesday, May 12th, from 4PM to 8PM local time. He said this should make the time reasonable for participants from the west coast of the US. There were no objections. Bob said Randy Wolff had already come up with a schedule of announcements, and the first one will go out in March. Randy Wolff and Bob are to continue communicating with Michael Schäder and Ralf Bruening.

- IEEE EMC+SIPI (July 27-August 13, 2021 virtual)

- DesignCon 2021 (August 16-18, 2021)

Randy Wolff said that if we want to do summits in conjunction with each of these, they would likely be on Friday, August 13th for EMC +SIPI and Monday, August 16th for DesignCon. DesignCon is tentatively planned to be in person. EMC+SIPI is virtual.

Zhiping Yang said that because EMC+SIPI is a virtual event there's no issue with booking rooms and thus no hard deadline for scheduling an IBIS summit. However, they would like to finalize the agenda for the conference, so it would be good if IBIS picked a time soon so they could formally announce it. Zhiping noted that the conference is hosted jointly in the US and Europe, so an afternoon timeslot in the US might not be good for European attendees. Zhiping to check on any deadline for the agenda, possible special registration codes for IBIS members, and to see if the EMC society has a preferred time for the IBIS summit [AR].

Zhiping asked for any feedback in terms of the registration process for the last EMC+SIPI and IBIS summit. He recalled that everyone had been asked to register through the EMC+SIPI site even though the summit is free. Randy said he thought that process had worked well.

QUALITY TASK GROUP

Mike LaBonte reported that the group is meeting on Tuesdays at 8:00 a.m. PT. He thanked everyone who had helped them by responding to the survey of ibischk source code licensees. They had asked for feedback on the nature of the code use, what would make it more useful, any issues with the recently discussed security concerns, etc. Mike said some respondents had even provided static code analysis reports. He said they are still investigating the proposed security fixes and are open to more feedback from licensees.

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. The group had been reviewing the current AMI flow for Redrivers and may continue on that topic depending on today's discussion of BIRD210. Arpad said that Chulsoon Hwang from Missouri S&T would be presenting some work on PI modeling, specifically power supply induced jitter modeling, at the next meeting. Zhiping Yang noted that Chulsoon had also submitted a technical presentation on this topic for the EMC+SIPI symposium.

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 group had recently submitted a new BIRD202.2. They had been considering a proposal to support multiple [EMD Parts] lists, which would have required a new version of the BIRD, but had decided not to move forward with that proposal. They had found a few minor editorial issues with BIRD202.2 that could be handled during the editorial process. At the last meeting, they had voted to suspend the task group. This was to give participants more time to focus on upcoming work in 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 task group would restart on Friday, February 26th. The group plans to meet at 9:00 a.m. PT on the Fridays that do not have Open Forum teleconferences. The meeting will use the Open Forum teleconference's connection details. Interested parties can also participate via the ibis-editorial mailing list.

Task group material can be found at:

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

NEW ADMINISTRATIVE ISSUES

- SAE ITC meeting

Randy Wolff reported that the IBIS Board had met with SAE ITC management three weeks ago. The Board had provided updates on summit activities, IBIS 7.1, etc. Standardization was also discussed. We haven't standardized an IBIS specification in a long time, but SAE ITC representatives had said it is fairly straightforward to do it through them.

Randy reported that they had also talked about working with IEEE if we want to submit any IBIS specifications for IEEE standardization. Randy asked Zhiping Yang if he had found out whether SAE ITC is part of the IEEE SA Industry Affiliate Network. Zhiping said SAE ITC had a top level relationship with IEEE, but he wasn't yet sure of the exact details. Zhiping said he had confirmed that we could use an SAE, IEEE, IBIS tri-logo if we wanted to, and the easiest way to do that would be for IBIS to join the IAN. Zhiping said he was investigating alternate ways because he thought the cost of the IAN was \$4,200 per year.

Randy said the group had also discussed the IBIS policies and procedures document. Our document currently mentions that anything not specified follows the rules of the Aerospace Council of SAE ITC. The SAE ITC representatives confirmed that we should not link to that policies document anymore, and we should have our own policies related to how we conduct a standards vote. So, we will be looking into updating our document at some point.

They had also discussed websites. SAE ITC has their Standards Works website, which many of their groups use to store documents, conduct votes, etc., for anything related to working on standards. That website is currently in revision and not something we've used yet, but we might in the future. SAE ITC is also working on a redesign of its website and may want some feedback from us on that.

BIRD210: NEW REDRIVER AMI FLOW

Fangyi Rao shared a presentation summarizing the newly submitted BIRD. The BIRD is designed to address three limitations in the current specification's flows:

- The upstream cumulative impulse response of the Redriver channel is not provided to the terminal Rx in AMI_Init. If the terminal Rx has DFE, the end-to-end impulse response needed for statistical simulations is not available.
- The upstream cumulative impulse response of the Redriver channel is not provided to either Tx or Rx in AMI_Init, so AMI_Init cannot perform optimization based on the upstream signal.
- The combination of Tx GetWave model with Rx Init-only model leads to a requirement for deconvolution in time domain simulations.

The BIRD introduces a new AMI Reserved Parameter, Use_v7p1_AMI_Flow, which is Usage In and Type Boolean. If the new parameter is set to True by the EDA tool, then the new flow is used, and the tool adds two additional columns at the end of the impulse matrix passed to

AMI_Init. The first column is for the cumulative upstream IR. The second column is a placeholder in which the model returns the impulse response of its equalizers and gain, excluding DFE. A model specifying this parameter must have Init_Returns_Impulse=True.

Fangyi reviewed a table showing the inputs and outputs in the legacy and new columns of the impulse matrix for the initial Tx, Redriver Rx and Tx, and the terminal Rx. Fangyi noted that the aggressors in the impulse matrix can be FEXT or NEXT, there are no limitations. For the terminal Rx, Fangyi noted that equalization, including any DFE, is applied to the new cumulative upstream impulse response column. The equalization, without DFE, is returned in the second new column, and it is applied by the model to the legacy column containing the immediate upstream impulse response. Fangyi said that after all the AMI_Init functions have been called with this new flow, the EDA tool has the impulse responses it needs for every section, and it can compute all the crosstalk path combinations.

Fangyi said that with this new flow, since the model's AMI_Init returns its equalization response in the second new column, the EDA tool can provide a proxy AMI_GetWave function if the model doesn't have one.

Arpad Muranyi asked if the regular flow descriptions had also been modified in this BIRD to take advantage of the new columns. Fangyi said he had only modified the Redriver flow sections. Bob Ross said this was the first time we have had a Boolean In Reserved Parameter. Radek Biernacki said the logic is clear, if the parameter is present it means the model supports both flows. The EDA tool sets it to True or False as it sees fit. Bob agreed and said if the tool doesn't support the new flow then it defaults to the old flow. Fangyi noted that the BIRD requires that the List of choices contains both TRUE and FALSE.

Walter Katz said we all agree that the current Redriver flow is simply wrong. This BIRD addresses the problem, but it is more complicated than necessary. The first new column, containing the cumulative upstream impulse response, addresses the Redriver flow issue, but he thought that information could instead be provided in the legacy first column. He noted that Fangyi disagrees with that approach. Walter said the second new column, used by the model to return the LTI portion of its equalization, is only there to avoid the deconvolution problem when model makers don't provide an AMI_GetWave. Walter suggested that there's no excuse for a model maker releasing an Init-only model, because an AMI_GetWave can easily be added. Walter said he did not see a compelling reason to change the size of the impulse matrix passed to AMI_Init. He said he had proposed a simpler fix for the Redriver flow issue in BIRD166, which Fangyi had correctly pointed out did not properly handle crosstalk. Walter said he thought we could end up meeting in the middle on a less complicated approach. Walter moved to send BIRD210 back to the ATM task group for further discussions. Bob seconded. There were no objections. Arpad said he would add it back to the ATM agenda.

Bob asked if it would be a problem if this were not included in IBIS 7.1. Radek said we've been talking about this issue for a long time, and BIRD210 addresses the problem correctly, so it would be good to include it in 7.1. Arpad asked whether it was worth holding up 7.1 for this. He said we didn't have to wait a long time to introduce a 7.2 if we think this Redriver fix is important. Walter agreed and said he was confident we could come up with an approach that doesn't require a new parameter but does address Fangyi's valid criticisms of the BIRD166 approach. Randy Wolff said we will have to decide at some point whether we are going to wait to include it in 7.1.

BIRD202.2: ELECTRICAL DESCRIPTIONS OF MODULES

Randy Wolff reported that the Interconnect task group had decided against a syntax change to allow multiple [EMD Parts] lists. They had decided this was getting too complicated and was not worth it since the model maker could support this scenario by creating multiple EMD files. Therefore, the group did not plan to introduce a BIRD202.3 for new technical changes. He noted that several minor editorial issues had been discovered, shared them with the group, and said they could be handled in the Editorial task group.

Randy asked if anyone not participating in the Interconnect task group had read the BIRD. Arpad Muranyi said the task group generally felt the BIRD was ready for a vote. Radek Biernacki said that since the task group had previously reported that a BIRD202.3 might be coming, people might not have read BIRD202.2 yet. He suggested the minor edits be made, the new version be uploaded, and a vote scheduled for the meeting after next. Randy said the editorial changes could be made quickly and BIRD202.3 could be submitted quickly. Walter moved that the editorial changes be made to BIRD202.2 to create BIRD202.3, and that we schedule a vote on the BIRD at the March 12, 2021 IBIS Open Forum teleconference. Bob Ross seconded. There were no objections. Randy to send an email to the Open Forum announcing the vote [AR].

BIRD209: MAKE CLOCK TIMES OUTPUT REQUIRED FOR CLOCK EXECUTABLE MODELS

Arpad Muranyi briefly summarized the BIRD, which was introduced at the last meeting. It is intended to supersede BIRD204, and it provides a minor technical change to BIRD204. In a scenario where the data executable model specifies that it wants “Times”, the EDA tool would have a hard time generating the proper clock ticks itself. Therefore, BIRD209 states that if the data executable model specifies “Times”, the clock executable model must have AMI_GetWave and it must return clock ticks.

Bob Ross noted an editorial issue whereby “DLL” should be replaced with “executable model” in the BIRD. Arpad said there is already an entry for this in the IBIS 7.0 known issues list to be applied to this BIRD and all others.

Arpad moved to schedule a vote on the BIRD at the March 12, 2021 IBIS Open Forum teleconference. Walter Katz seconded. There were no objections. Randy to send an email to the Open Forum announcing the vote [AR].

Walter said it is unfortunate that we don't have the ability to amend a BIRD that has been approved but hasn't yet made it into the specification. He said that this is just traditional, and there is nothing in our policies that prevents us from amending a BIRD. Mike LaBonte agreed. Randy agreed and said we could consider allowing it in the future.

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 AND TSCHK PARSER AND BUG STATUS

-ibischk

Bob Ross said there were no new parser BUGs to report. He said they are still considering a source code security update. Deciding whether to address it in the next release is one gating item as they create a specification for the parser developer. Mike LaBonte said the security issue involves functions that copy memory but don't know the size of the destination. These could be subject to deliberate buffer overflows, and the suggestion is to replace calls to these functions with new versions that are aware of the amount of data to copy. The Quality task group had experimented with 3 different static analysis tools, and the results overlapped partially but not completely. Mike had experimented with splint, which is freely available, and said it would be ideal to include something like that in the make files so the developer could run it. Randy Wolff and Mike said they will gather more information from the recent survey of ibischk source code licensees and have to make a decision at some point.

-tschk

Bob reported that Mike is modifying the tschk2 source code to address the 4 listed BUGs. He said they would potentially issue a tschk2.0.1 when Mike is done. Mike said work on BUG4 is completed, and he's considering introducing a precision setting to address BUG3.

NEW TECHNICAL ISSUES

- Michael Mirmak asked if IBIS maintains an official repository for any collateral, source code, etc., such as would exist for open source projects. If someone had developed any official source code that might be subject to revision, do we have our own GitHub equivalent for it? Arpad Muranyi said the short answer was no, but he recalled that during the early days of AMI development at least two companies had provided initial examples and test vehicles. Randy Wolff and Bob Ross said this might be worth discussing further.

NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on March 12, 2021. The following teleconference meeting is tentatively scheduled for April 2, 2021.

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/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 | December | January | January | February |
|-------------------------------|-------------------|--------------------------------|----------|----------|----------|----------|
| | | | 04, 2020 | 08, 2021 | 29, 2021 | 19, 2021 |
| ANSYS | User | Active | X | X | X | X |
| Applied Simulation Technology | User | Inactive | - | - | - | - |
| Broadcom Ltd. | Producer | Inactive | - | - | - | - |
| Cadence Design Systems | User | Active | X | 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 | - | - | - | - |
| Infineon Technologies AG | Producer | Inactive | - | - | - | - |
| Instituto de Telecomunicações | User | Inactive | - | - | - | - |
| IBM | Producer | Inactive | - | - | - | - |
| Intel Corp. | Producer | Active | X | X | X | X |
| Keysight Technologies | User | Active | X | X | X | X |
| Marvell | Producer | Active | X | X | X | X |
| Maxim Integrated | Producer | Active | X | X | X | - |
| Mentor, A Siemens Business | User | Active | X | X | X | X |
| Micron Technology | Producer | Active | X | X | X | X |
| MST EMC Lab | User | Inactive | - | - | - | - |
| 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 | 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.