

EIA IBIS Open Forum Minutes

Meeting Date: **July 13, 2007**

GEIA STANDARDS BALLOT VOTING STATUS

See last page of the minutes for the voting status of all member companies.

VOTING MEMBERS AND 2007 PARTICIPANTS

| | |
|--------------------------------|---|
| Agilent | Ian Dodd*, Radek Biernacki*, Saliou Dieye, Riccardo Giacometti |
| AMD | Nam Nguyen*, Tadashi Arai |
| Applied Simulation Technology | (Fred Balistreri) |
| Apple Computer | (Bill Cornelius) |
| Cadence Design Systems | [Lance Wang], C. Kumar, Hemant Shah, Patrick dos Santos, Shangli Wu* |
| Cisco Systems | Syed Huq*, Tram Bui, AbdulRahman Rafiq, Huyen Pham, Darja Padilla, Mike LaBonte*, Paul Ruddy, Gurpreet Hundal, Luis Boluna, Ehsan Kabir, Jehyoung Lee, Susmita Mutsuddy, Eddie Wu |
| Ericsson | Anders Ekholm*, Ole Segtum |
| Freescale | Jon Burnett |
| Green Streak Programs | Lynne Green |
| Hitachi ULSI Systems | Kazuyoshi Shoji |
| Intel Corporation | Michael Mirmak*, [Arpad Muranyi] |
| IO Methodology | Lance Wang* |
| LSI | Frank Gasparik, Kim Helliwell, Dinh Tran, Praveen Soora |
| Mentor Graphics | John Angulo*, Arpad Muranyi*, [Ian Dodd], Eric Rongere, Stephane Rousseau, Bill Hargin, Patrick Carrier |
| Micron Technology | Randy Wolff, Pavani Jella* |
| Nokia Siemens Networks GmbH[1] | Eckhard Lenski*, Flavio Maggioni, Roberto Preatoni, Umberto Gatti, Massimo Ceppi |
| Panasonic | (Atsuji Ito) |
| Samtec | (Corey Kimble) |
| Signal Integrity Software | Barry Katz, Douglas Burns, Mike Steinberger, Walter Katz, Todd Westerhoff |
| Sigrity | Sam Chitwood*, Sandy Dung |
| STMicroelectronics | Antonio Girardi*, Giacomo Bernardi*, Roberto Izzi |
| Synopsys | Ted Mido |
| Teraspeed Consulting Group | Bob Ross*, Tom Dagostino |
| Texas Instruments | Otis Gorley*, Richard Ward, Bonnie Baker |
| Toshiba | (Yasumasa Kondo) |

Xilinx
ZTE
Zuken

Bruce Bandeli, David Banas
(Shunlin Zhu)
Michael Schaefer, Ralf Bruening, John Berrie

OTHER PARTICIPANTS IN 2007

74ze Engineering
Agere
Altera
Ansoft Corporation
Apache Design Solutions
Applied Telisis, Inc. (ATI)
Cavium Networks
ChipX
Cybernet Systems
EFM
Enterasys
Extreme Networks
Fluent
Force10 Networks
Free Electron Software
GEIA
Hewlett Packard
Huawei Technologies
IBM
Infineon
Integrated Circuit Systems (ICS)
JEITA
Juniper Networks
Leventhal Design
Lynguent
National Institute of Applied
Science (INSA)
National Instruments
Netlogic
NEC Electronics Corporation
NESA
Northrop Grumman
Nuova Systems
NXP
Optimal Corporation
Politecnico di Torino
Renesas Technology
Samsung
Sedona International
Siemens AG [1]

Linc Jepson
(Nirav Patel)
Hui Liu, Zhe Lin, Ravindra Gali, Salman Jiva
(Michael Brenneman)
(Ji Zheng)
Vladimar Mandrusov
Johann Nittmann
Jay Hidy, Oren Dvir
Kazuhiki Kusunoki
Ekkehard Miersch
Robert Haller
Kevin Ko
(Chetan Desai)
Robert Badal
Al Davis
(Chris Denham)
Shafiq Rahman
ChunXing Huang, Bob He
Michael Sorna, Adge Hawes
Christian Sporrer
(Dan Clementi)
Atsushi Ishikawa
Raul Lozano
Roy Leventhal
Andrew Levy
Etienne Sicard

Lee Maixman
Eric Hsu
Takeshi Watanabe, Hock Seow, Huy Tran
Edward Sayre
Dusan Radosevic
Zhiping Yang*, Lin Shen
H N Sudarshan
Marc Kowalski
Igor Stievano, Michelangelo Bandinu
Takuji Komeda
Sang-Soo Park
Joe Socha
[Eckhard Lenski], Manfred Maurer

| | |
|---------------------------|-------------------------|
| Silego | (Joe Froniewski) |
| Sun Microelectronics | Leon Yang |
| Tiburon Design Automation | Patrick Challacn |
| White Electronics Designs | John Perez |
| Xyratex | Paul Levin, Joseph Chan |

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 | Telephone Number | Bridge # | Passcode |
|----------------|------------------|----------|----------|
| August 3, 2007 | 1-916-356-2663 | 3 | 964-5279 |

All meetings are 8:00 AM to 9:55 AM 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. When calling into the meeting, provide the bridge number and passcode at the automated prompts. If asked by an operator, please request to join the IBIS Open Forum hosted by Michael Mirmak. For international dial-in numbers, please contact Michael Mirmak.

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM

No new participants.

CALL FOR PATENTS

Michael Mirmak called for any patents or pending patents related to the IBIS Version 3.2, 4.0, 4.1, 4.2, or ICM 1.1 specifications. No patents were declared.

MEMBERSHIP UPDATE AND TREASURER'S REPORT

No updates.

REVIEW OF MINUTES AND ARS

Michael Mirmak called for comment regarding the minutes of the June 22, 2007 IBIS Open Forum teleconference. The minutes were approved without changes or objections.

WEB PAGE UPDATES

Syed Huq reported that the FAQ page has been updated and the changes to the Roster are in progress, as membership renewals are received.

MAILING LIST ADMINISTRATION

Bob Ross reported that the list is running normally.

MODEL LIBRARY UPDATE

Lance Wang reported no new library models.

PRESS UPDATE

Bob Ross noted that a new article on IBIS and SERDES interfaces by Steve Kaufer was published in the July 2007 edition of *Printed Circuit Design and Manufacture*.

The article, "High frequency digital signals require complex models to accurately simulate the signal's path," is available at:

<http://pcdandm.com/cms/cms/content/view/3616/95/>

MISCELLANY/ANNOUNCEMENTS

None.

OPENS FOR NEW ISSUES

None.

INTERNATIONAL/EXTERNAL PROGRESS

Upcoming conferences of interest to IBIS members are listed below.

SSP, the IEEE Statistical Signal Processing Workshop, is to be held August 26-29, 2007 in Madison, Wisconsin. The deadline for paper submissions has passed. More information can be found at:

<http://ssp07.org/>

The 6th International Workshop on Electromagnetic Compatibility of Integrated Circuits (EMC Compo 2007) is to be held November 28-30, 2007, in Torino, Italy. More information can be found at:

<http://www.emccompo07.polito.it/>

Bob also noted that Roy Leventhal updated the TC10 standards committee on IBIS Open Forum efforts to revise Touchstone.

IEC APPROVAL ACTIVITIES

No updates.

SUMMITS

- Asian IBIS Summit (China) Planning

The Asian IBIS Summit (China) will be held Tuesday, September 11 at The Park Plaza Science Park hotel in Beijing. Bob Ross and Lance Wang are contacts for attendees and presenters. The first, second and third calls for papers have been distributed. Financial arrangements are nearly finalized. Official sponsors so far include Huawei Technologies, Agilent, Ansoft, Cadence, Intel, Mentor Graphics, Sigrity, SiSoft, Synopsys and ZTE Corporation. Spaces still exist for presentations and commitments as early as possible are appreciated.

- Asian IBIS Summit (Japan) Planning

The Asian IBIS Summit (Japan) will be held Friday, September 14 at JEITA headquarters in Tokyo. Sponsors include Agilent Technologies, ATE Service Corporation, Cadence Design Systems, Cybernet Systems and Mentor Graphics. The other official sponsor of the Japan summit is JEITA with others to be determined. The second announcement is scheduled for distribution July 13. Bob is the main contact for this event.

Sponsorship opportunities for the Asian IBIS summits are available, with sponsors receiving free mentions in the minutes, agenda, and other announcements. Contact the IBIS Board for further details.

Michael Mirmak reported that two separate companies had requested, during his recent trip to Asia, that future summits be held in Taiwan, Singapore or Malaysia. It is difficult for companies in Taiwan to get visas to attend the mainland China summit. A local event would be much more convenient. In addition, companies further from Japan and mainland China tend not to attend the events there, due to the distances involved.

Bob Ross noted that the events should be held relatively closely in time, to permit presenters and board members to attend all of them with reduced travel expenses. Anders Ekholm observed that running several summits in close time proximity would still mean that board participants would spend several weeks away from their home offices.

The attendees agreed that an additional September event would not be feasible. However, an additional location for the fall of 2008 will be considered, with perhaps an exploratory event earlier in the year.

IBIS QUALITY TASK GROUP

Mike LaBonte reported that the team is continuing to analyze the [Model] section of the IBIS specification. This is expected to take some time.

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

http://www.eda-stds.org/ibis/quality_wip/

IBIS MODEL REVIEW TASK GROUP

No update.

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that meetings will resume shortly with both updates to the BIRD as well as potential test examples being prepared for review.

Task group material can be found at:

http://www.eda-stds.org/ibis/macromodel_wip/

AD HOC TASK GROUPS (INTERCONNECT)

Michael Mirmak reported that the group has not met recently, due to holidays and travel. However, meetings will soon resume, considering IIRD9 (updates to ICM) and IBIS-to-ICM links after that.

Task group material, including the Touchstone2 draft specification, can be found at:

<http://www.eda.org/ibis/adhoc/interconnect/>

NEW ISSUES

None.

IBISCHK4 BUG STATUS

Bob Ross noted that IBISCHK4 version 4.2.2 executables had been prepared for several operating systems, and that feedback has been positive from the testers. Without objection, the attendees agreed to distribute the IBISCHK4 version 4.2.2 parser as soon as executables were available for the common operating systems supported under previous releases.

Bob added that the 4.2.2 parser closes all open BUG reports.

ICMCHK1 BUG STATUS

No update.

BIRD98.1: GATE MODULATION EFFECT (TABLE MODEL)

Antonio Girardi thanked Bob Ross for his detailed comments on the BIRD text, noting that most of the suggested changes could be easily made. Additional discussion is still needed on issues

related to measuring effective current for different output voltages. A new draft of the BIRD is being prepared.

PROPOSED TOUCHSTONE2 SPECIFICATION INTRODUCTION

Michael Mirmak presented a detailed overview of the proposed changes to the Touchstone specification. The need for an update to the specification was noted, at a high level, and the new keywords and features were presented. Most new features enable new applications, such as combined power and signal network extraction, using keywords similar to IBIS. Michael emphasized that the new version of Touchstone does not invalidate existing files. Instead, all existing Touchstone files that conform to the original specification will be considered legal and valid under the revised version. Only if the files use new keywords or features do the new rules become requirements.

Bob Ross inquired whether the [Reference] keyword can “wrap” across multiple lines. Michael responded that this was the intent of the text, but may not have been clear. Zhiping Yang also asked about the new specification’s support for mixed-mode S-parameters, in the format commonly used today for the original Touchstone. Michael answered that this data would not be automatically parsed as mixed-mode, and that comments would be needed in the new version to inform users of the mixed-mode nature of the data. Arpad Muranyi asked about the removal of normalization. This was intended as a simplification, to reduce confusion once multiple port reference impedances were added. The team suggested some additional actions related to version numbers and parser development, including clarification of the number “2” in the name and the version number. These will be discussed with the GEIA in greater detail while the technical issues are being handled.

Sam Chitwood made a number of suggestions for improvement, intended to reduce file sizes in data sets for large numbers of ports. These included:

- supporting an upper-half or lower-half matrix format for passive interconnects
- supporting a binary representation at the specification level
- adding a keyword to explicitly state the number of frequency points in the file

Sam explained that higher frequency points may sometimes be questionable in terms of validity, and that tedious hand-editing is often needed to remove this data. An explicit keyword would provide an implicit “bandwidth” that tools and users could adjust dynamically to exclude data. Bob noted that this would also help as another internal checking device for proper syntax. Michael inquired about interpolation and sampling intervals being named in the file, as some proprietary interconnect matrix models do. Sam responded that this may not be simple or desirable.

Michael noted that this presentation represented the first “call for comments” for the draft, for standardization voting. These suggestions could easily be worked into an updated draft, for consideration by the Open Forum during upcoming meetings.

The summary presentation can be found at:

<http://www.eda.org/ibis/adhoc/interconnect/touchstone2-summary.pdf>

The draft specification can be found at:

http://www.eda.org/ibis/adhoc/interconnect/touchstone_spec2_draft8.pdf

NEW TECHNICAL ISSUES

None.

OPEN ISSUES

None.

NEXT MEETING

The next IBIS Open Forum teleconference will be held August 3, 2007 from 8:00am to 10:00am US Pacific Time.

NOTES

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This meeting was conducted in accordance with the GEIA Legal Guides and GEIA Manual of Organization and Procedure.

The following e-mail addresses are used:

majordomo@eda-stds.org

In the body, for the IBIS Open Forum Reflector:
subscribe ibis <your e-mail address>

In the body, for the IBIS Users' Group Reflector:
subscribe ibis-users <your e-mail address>

Help and other commands:
help

ibis-request@eda-stds.org

To join, change, or drop from either or both:
IBIS Open Forum Reflector (ibis@eda-stds.org)
IBIS Users' Group Reflector (ibis-users@eda-stds.org)
State your request.

ibis-info@eda-stds.org

To obtain general information about IBIS, to ask specific questions for individual response, and to inquire about joining the EIA-IBIS Open Forum as a full Member.

ibis@eda-stds.org

To send a message to the general IBIS Open Forum Reflector. This is used mostly for IBIS Standardization business and future IBIS technical enhancements. Job posting information is not permitted.

ibis-users@eda-stds.org

To send a message to the IBIS Users' Group Reflector. This is used mostly for IBIS clarification, current modeling issues, and general user concerns. Job posting

information is not permitted.

ibis-bug@eda-stds.org

To report ibischk parser BUGs. The BUG Report Form resides along with reported BUGs at:

<http://www.eda-stds.org/ibis/bugs/ibischk/>

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

icm-bug@eda-stds.org

To report icmchk1 parser BUGs. The BUG Report Form resides along with reported BUGs at:

http://www.eda-stds.org/ibis/icm_bugs/

http://www.eda-stds.org/ibis/icm_bugs/icm_bugform.txt

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

<http://www.eda-stds.org/ibis/bugs/s2ibis/bugs2i.txt>

<http://www.eda-stds.org/ibis/bugs/s2ibis2/bugs2i2.txt>

<http://www.eda-stds.org/ibis/bugs/s2iplt/bugspl.txt>

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

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

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

<http://www.eda-stds.org/ibis/directory.html>

All eda.org documents can be accessed using a mirror:

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

Note that the "/ibis" text should be removed from directory names when this URL mirror is used.

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GEIA STANDARDS BALLOT VOTING STATUS

I/O Buffer Information Specification Committee (IBIS)

| Organization | Interest Category | Standards Ballot Voting Status | June 1, 2007 | June 5, 2007 | June 22, 2007 | July 13, 2007 |
|-------------------------------|-------------------|--------------------------------|--------------|--------------|---------------|---------------|
| Advanced Micro Devices | Producer | Inactive | √ | | | √ |
| Agilent Technologies | User | Active | | √ | √ | √ |
| Apple Computer | User | Inactive | | | | |
| Applied Simulation Technology | User | Inactive | | | | |
| Cadence Design Systems | User | Active | | √ | √ | √ |
| Cisco Systems | User | Active | √ | √ | | √ |
| Ericsson | Producer | Active | √ | √ | | √ |
| Freescale | Producer | Inactive | | | | |
| Green Streak Programs | General Interest | Inactive | √ | | | |
| Hitachi ULSI Systems | Producer | Inactive | | √ | | |
| Intel Corp. | Producer | Active | √ | √ | √ | √ |
| IO Methodology | User | Active | | | √ | √ |
| LSI Logic | Producer | Inactive | | | √ | |
| Mentor Graphics | User | Active | √ | √ | √ | √ |
| Micron Technology | Producer | Active | √ | | √ | √ |
| Nokia Siemens Networks | Producer | Active | √ | | √ | √ |
| Panasonic | Producer | Inactive | | | | |
| Samtec | Producer | Inactive | | | | |
| Signal Integrity Software | User | Inactive | | √ | | |
| Sigrity | User | Inactive | | √ | | √ |
| STMicroelectronics | Producer | Inactive | √ | | | √ |
| Synopsys | User | Inactive | | | | |
| Teraspeed Consulting | General Interest | Active | √ | √ | √ | √ |
| Texas Instruments | Producer | Active | √ | √ | | √ |
| Toshiba | Producer | Inactive | | | | |
| Xilinx | Producer | Active | | √ | √ | |
| ZTE | User | Inactive | | | | |
| Zuken GmbH | User | Inactive | | √ | | |

CRITERIA FOR 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 GEIA 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.