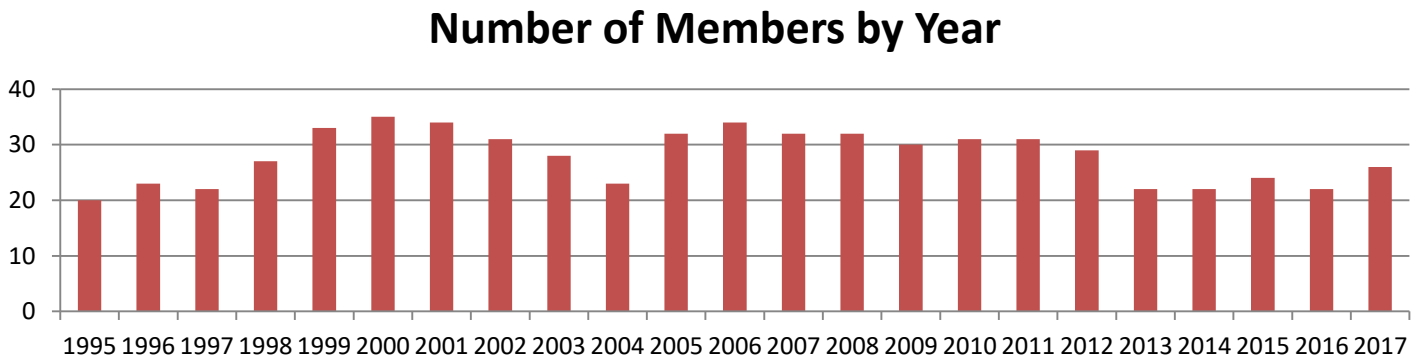
IBIS Update

Mike LaBonte
SiSoft
Chair, IBIS Open Forum

2017 Asian IBIS Summit
Shanghai, PRC
November 13, 2017

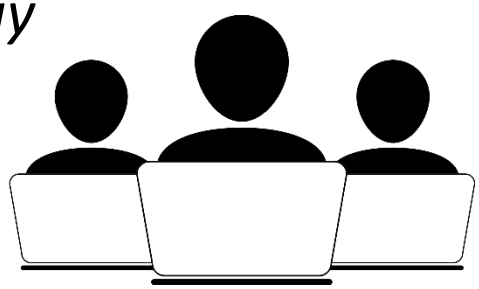
http://www.ibis.org/

26 IBIS Members



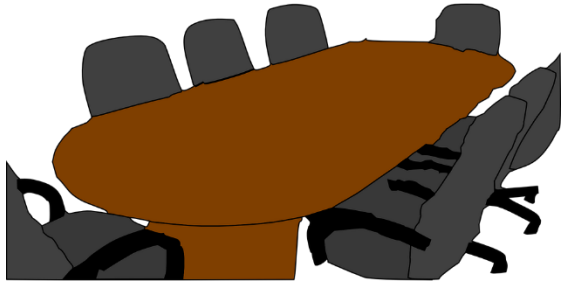
IBIS Officers 2017-2018

Chair:	*Mike LaBonte, SiSoft*
Vice-Chair:	*Lance Wang, IO Methodology Inc.*
Secretary:	*Randy Wolff, Micron Technology*
Treasurer:	*Bob Ross, Teraspeed Labs*
Librarian:	*Anders Ekholm, Ericsson*
Postmaster:	*Curtis Clark, ANSYS*
Webmaster:	*Mike LaBonte, SiSoft*



2018 Officer Election nominations open May 17

IBIS Meetings



- Weekly teleconferences
  - Quality Task Group (Tuesdays)
  - Advanced Technology Modeling Task Group (Tuesdays)
  - Interconnect Task Group (Wednesdays)
  - Editorial Task Group (some Fridays)
- IBIS Open Forum teleconference every 3 weeks
  - 486 meetings so far
- IBIS Summit meetings: DesignCon, IEEE SPI, EDICON USA, EPEPS, Shanghai, Taipei, Tokyo

SAE ITC

- SAE Industry Technologies Consortia is the parent organization of the IBIS Open Forum
- IBIS is assisted by SAE employees Thomas Munns, Phyllis Gross, Dorothy Lloyd
- SAE ITC provides financial, legal, and other services
- http://itc.sae.org/

Task Groups

- Interconnect Task Group
  - Chair: Michael Mirmak
  - http://ibis.org/interconn_wip/
  - Develop on-die/package/module/connector interconnect modeling BIRDs
- Advanced Technology Modeling Task Group
  - Chair: Arpad Muranyi
  - http://ibis.org/atm_wip/
  - Develop most other technical BIRDs
- Quality Task Group
  - Chair: Mike LaBonte
  - http://ibis.org/quality_wip/
  - Oversee IBISCHK parser testing and development
- Editorial Task Group
  - Chair: Michael Mirmak
  - http://ibis.org/editorial_wip/
  - Produce IBIS Specification documents

IBIS Milestones

I/O Buffer Information Specification

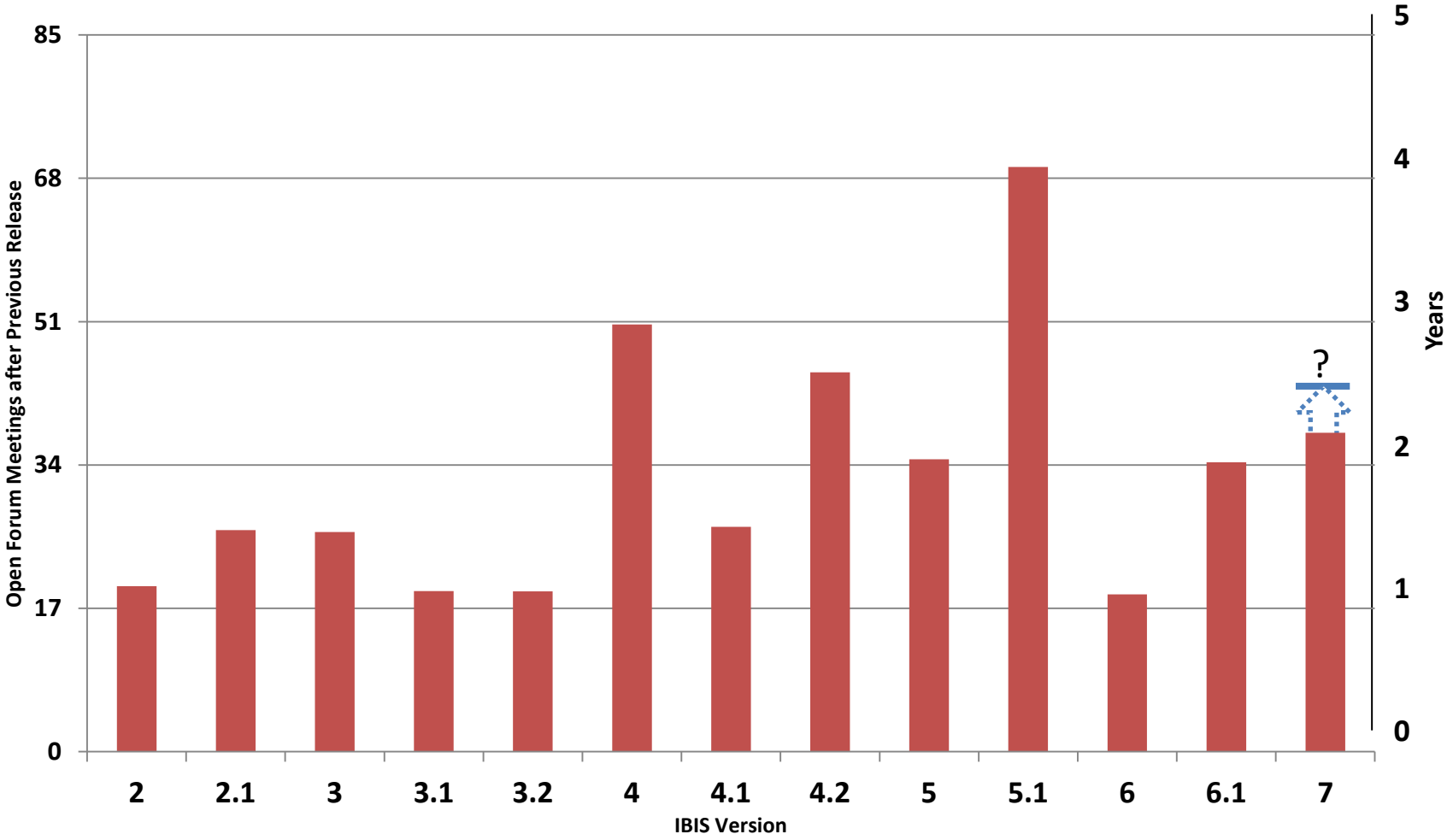
- 1993-1994 **IBIS 1.0-2.1**:
  - Behavioral buffer model (fast simulation)
  - Component pin map (easy EDA import)
- 1997-1999 **IBIS 3.0-3.2**:
  - Package models
  - Electrical Board Description (EBD)
  - Dynamic buffers
- 2002-2006 **IBIS 4.0-4.2**:
  - Receiver models
  - AMS languages
- 2007-2012 **IBIS 5.0-5.1**:
  - IBIS-AMI SerDes models
  - Power aware
- 2013-2015 **IBIS 6.0-6.1**:
  - PAM4 multi-level signaling
  - Power delivery package models
- **2018? IBIS 7.0**

Current development

Other Work

- 1995: **ANSI/EIA-656**
  - IBIS 2.1
- 1999: **ANSI/EIA-656-A**
  - IBIS 3.2
- 2001: **IEC 62014-1**
  - IBIS 3.2
- 2003: **ICM 1.0**
  - Interconnect Model Specification
- 2006: **ANSI/EIA-656-B**
  - IBIS 4.2
- 2009: **Touchstone 2.0***
- 2011: **IBIS-ISS 1.0**
  - Interconnect SPICE Subcircuit specification

IBIS Version Development



As of 13-Nov-2017

Possible IBIS 7.0 Timeline

Meeting Date	Milestone
4/21/2017	Vote to establish 7.0 as the next IBIS version passes
5/12/2017	*BIRD review and acceptance (10 meetings)*
…	…
2/16/2018	Vote to approve 7.0 BIRD set is scheduled for next meeting
3/9/2018	7.0 BIRD set accepted. Editorial work begins
3/30/2018	
4/20/2018	
5/11/2018	Editorial announces 7.0 ready. Review period begins
6/1/2018	
6/22/2018	Vote to ratify 7.0 scheduled for next meeting
7/13/2018	7.0 ratified

BIRD = Buffer Issue Resolution Document

BIRDs Possibly Included in IBIS 7.0

BIRD	Title
147.6	Back-channel Support
158.7	AMI Ts4file Analog Buffer Models
179	New IBIS-AMI Reserved Parameter Special_Param_Names
180	Require Unique Pin Names in [Pin]
182	POWER and GND [Pin] signal_name as [Pin Mapping] bus_label
183	[Model Data] Matrix Subparameter Terminology Correction
184.2	Model_name and Signal_name Restriction for POWER and GND Pins
185.2	Section 3 Reserved Word Guideline Update
186.4	File Naming Rules
187.3	Format and Usage Out Clarifications
188.1	Expanded Rx Noise Support for AMI
189.4	Interconnect Modeling Using IBIS-ISS and Touchstone
191.2	Clarifying Locations for Si_location and Timing_location
192.1	Clarification of List Default Rules

Green = currently accepted BIRD

BIRDs Possibly Excluded from IBIS 7.0

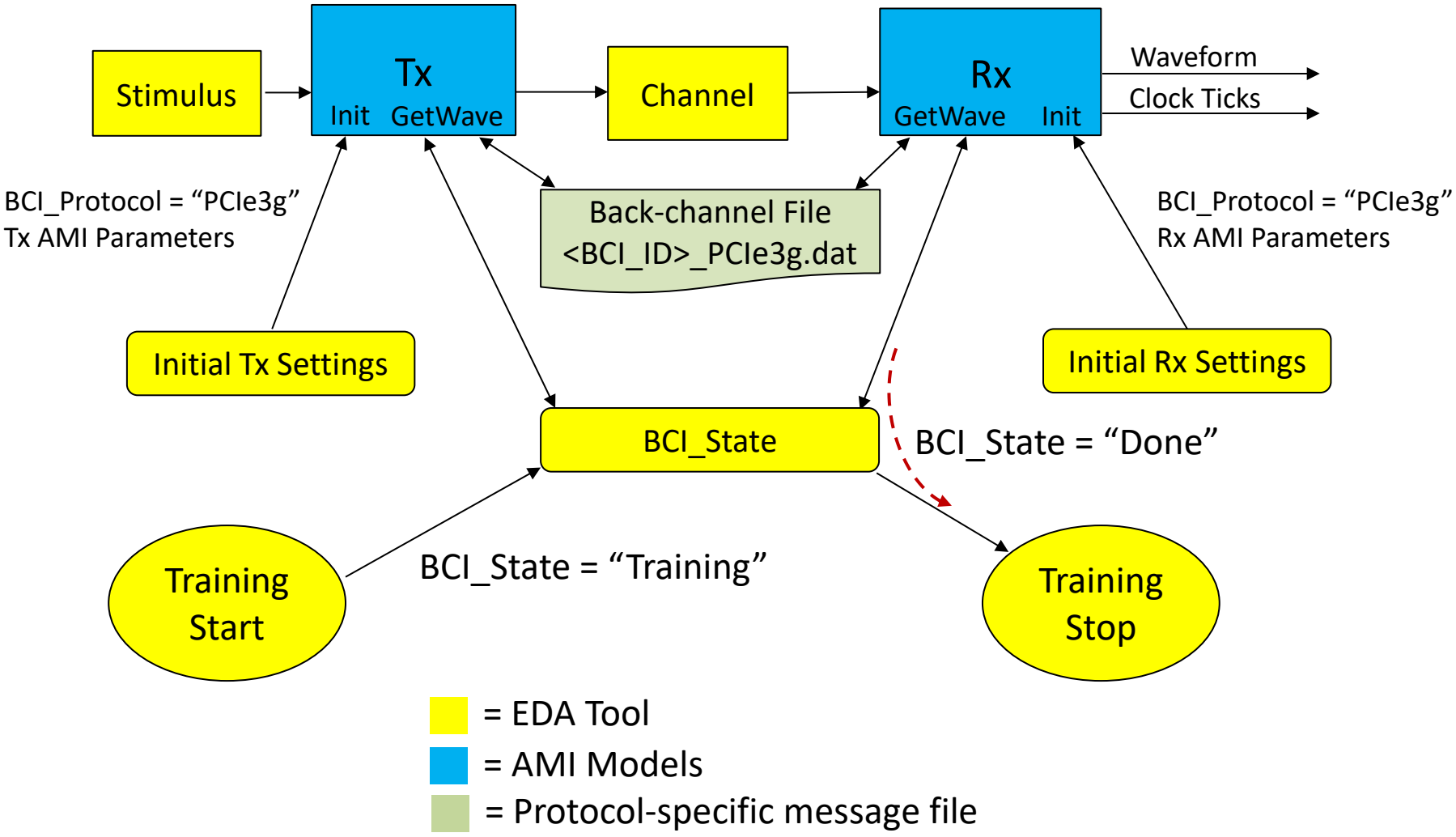
BIRD	Title
125.1	Make IBIS-ISS Available for IBIS Package Modeling
145.3	Cascading IBIS I/O buffers with [External Circuit]s using the [Model Call] keyword
166.2	Resolving problems with Redriver Init Flow
163	Instantiating and Connecting [External Circuit] Package Models with [Circuit Call]
164	Allowing Package Models to be defined in [External Circuit]
165	Parameter Passing Improvements for [External Circuit]s
181.1	I-V Table Clarifications
190	Clarification for Redriver Flow

White = currently not an accepted BIRD

BIRD 147.6, Back-channel Support

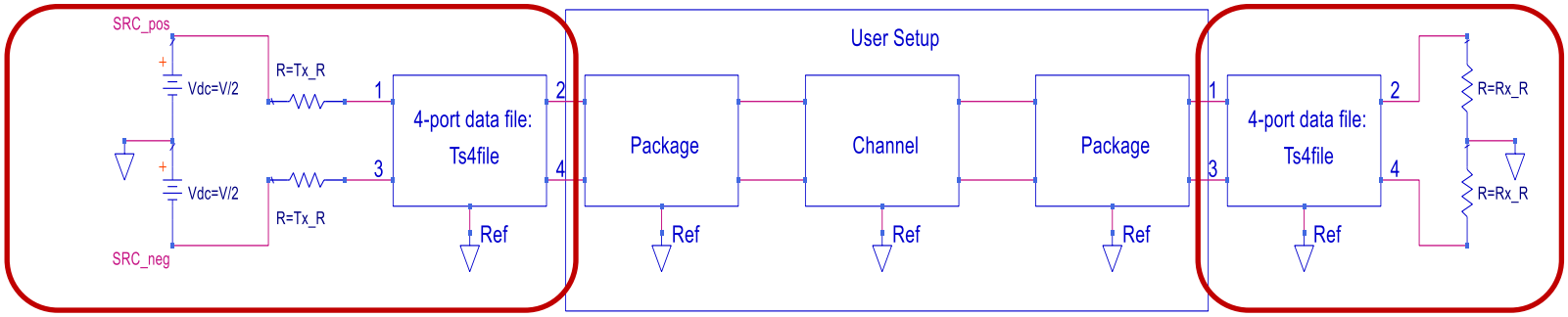
- Enable back-channel link training messages between the Tx and Rx executable models to enable link training to optimize equalization settings during time domain (AMI_GetWave) simulations.
- New AMI Parameters:
  - BCI_Protocol, BCI_State, BCI_ID, BCI_Message_Interval_UI, BCI_Training_UI

Link Training Back-channel



BIRD 158.7, AMI Ts4file Analog Buffer Models

- Touchstone on-die analog models for IBIS-AMI models directly included from the AMI file, bypassing the analog model in the IBIS file.
- Same as “TStoneFile” models, now “Ts4file”.



BIRD 188.1, Expanded Rx Noise Support for AMI

- Bounded (uniform) Rx Noise must be supported by IBIS-AMI, separately from the existing Gaussian random Rx Noise parameter.

Parameter:	**Rx_Noise, Rx_GaussianNoise**
Required:	No, and Rx_Noise is illegal before AMI_Version 6.0; No, and Rx_GaussianNoise is illegal before AMI_Version 7.0

Parameter:	**Rx_UniformNoise**
Required:	No, and illegal before AMI_Version 7.0

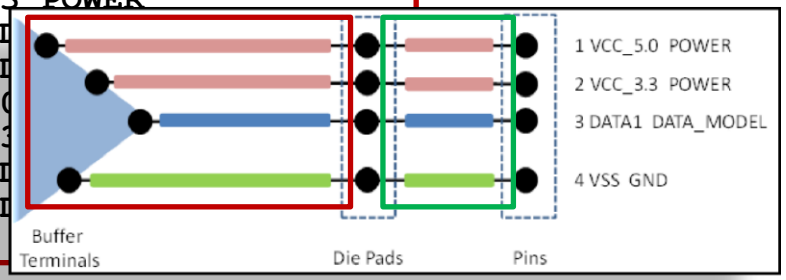
BIRD 189.4, Interconnect Modeling Using IBIS-ISS and Touchstone

```
[Interconnect Model Set]       Full_ISS_buf_pad_pin_PDN_4

[Interconnect Model]           Full_ISS_pad_pin_IO
File_IBIS-ISS    full_pad_pin_io.iss          full_pad_pin_IO_typ
Number_of_terminals = 8
1   Pin_Rail      pin_name        1     |   VCC_5.0 POWER
2   Pin_Rail      pin_name        2     |   VCC_3.3 POWER
3   Pin_I/O       pin_name        3     |   DATA1 DATA_MODEL
4   Pin_Rail      pin_name        4     |   VSS GND
5   Pad_Rail      pad_name     VCC1     |   VCC_5.0 POWER
6   Pad_Rail      pad_name     VCC2     |   VCC_3.3 POWER
7   Pad_I/O       pin_name        3     |   DATA1 DATA_MODEL
8   Pad_Rail      pad_name     VSS1     |   VSS GND
[End Interconnect Model]

[Interconnect Model]           Full_ISS_buf_pad_IO
File_TS          full_buf_pad_io.s8p |         full_buf_pad_IO_typ
Number_of_terminals = 8
1   Pad_Rail      pad_name     VCC1     |   VCC_5.0 POWER
2   Pad_Rail      pad_name     VCC2     |   VCC_3.3 POWER
3   Pad_I/O       pin_name        3     |   DATA1 D
4   Pad_Rail      pad_name     VSS1     |   VSS GND
5   Buffer_Rail   pin_name        1     |   VCC_5.0
6   Buffer_Rail   pin_name        2     |   VCC_3.3
7   Buffer_I/O    pin_name        3     |   DATA1 D
8   Buffer_Rail   pin_name        4     |   VSS GND
[End Interconnect Model]

[End Interconnect Model Set]
```



[Thank You]

IBIS Open Forum:
Web: http://www.ibis.org
Email: ibis-info@freelists.org

We welcome participation by all IBIS model makers, EDA tool vendors, IBIS model users, and interested parties.