

---

# Using DATA Files for IBIS-AMI Models

---

**Lance Wang**  
**DesignCon IBIS Summit**  
**Santa Clara, CA, USA**  
**February 3<sup>rd</sup>, 2017**



# Outline

- Motivation
- Platform/OS dependent DLL, SO
- Using DATA Files for AMI models
- The advantages using DATA Files for AMI models
- Test case for AMI models with DATA Files
- Summary

# Motivation

When we make and use AMI models:

- Who makes AMI executable:
  - Did I write the code that is compatible with all platform/OSs and compilers?
- Who puts everything together into an IBIS file:
  - Did I mess up 64bits and 32bits dll/so files in the IBIS file?
- Who uses AMI models:
  - Why doesn't this AMI model support my OS? Did I do anything wrong with them?

# Motivation

- Of course, everyone will blame EDA vendors



# Motivation



**Can we make everyone a LITTLE happier?**

# Platform/OS/Compiler Dependent

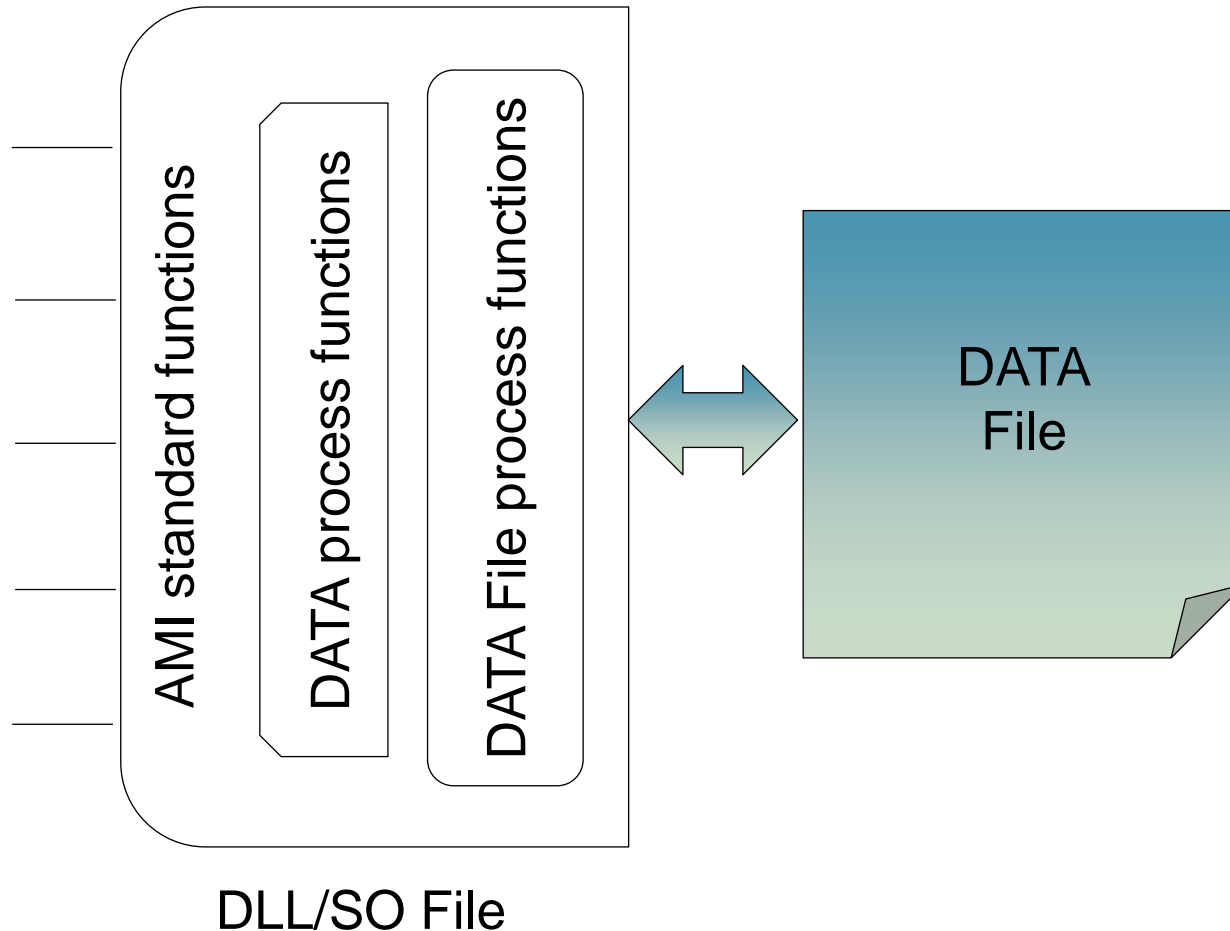
- We have so many platform/OS/Compilers to cover:
  - Windows, Linux, Unix, Mac OS, etc.
  - WinXP, Win8, Win10, Ubuntu, Debian, Fedora, CentOS, Red Hat, etc. Solaris, Solaris 10, HP-UX, OSx, etc.
  - Visual Studio 8 – 11, CC, gcc, etc.
- We also have 32 bit, 64 bit and maybe 128 bit in the future to cover.

**This is not all!**

# Platform/OS/Compiler Dependent

- This makes Designers/Modelers have many headaches:
  - Can my programmed source code be compiled successfully in all platforms?
  - How do I compile and debug my code in all platforms and compilers?
  - Do I need to support all of them?

# Using DATA Files for AMI models





# Using DATA Files for AMI models

- In DLL/SO

- AMI standard functions

- AMI\_Init(), AMI\_GetWave(), AMI\_Close(). Etc.

- DATA process functions

- Process the DATA for algorithms
    - Take inputs from AMI standard functions
    - Apply algorithms
    - Put results back to AMI standard functions

- DATA File process functions

- Read DATA File
    - Decryption (Optional)

# Using DATA Files for AMI models

- In DATA File
  - Software code, and/or
  - Behavioral data, and/or
  - Parameters, or/and
  - Other data
  - Encrypted contents (Optional)

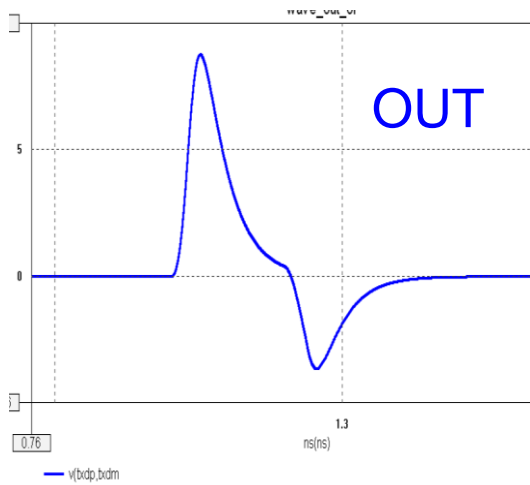
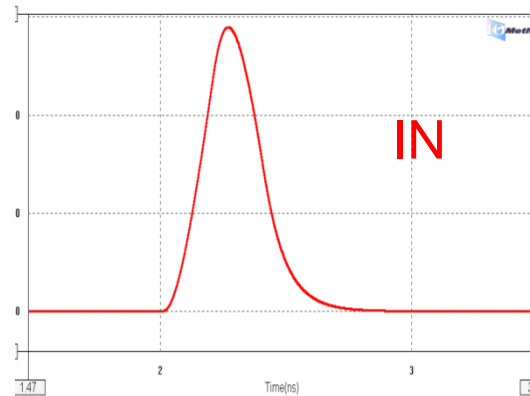
# Using DATA Files for AMI models

- The DLL/SO file
  - Could be made by professional software programmers for model vendors or EDA vendors
  - **One time job!** It can be used for many different DATA Files
- The DATA File
  - Can be created by Designers or Modelers
  - No compilation needed.  
Platform/OS/Compiler/Bits **independent.**

# The advantages using DATA Files for AMI models

- DATA File is Platform/OS/Compiler/Bit INDEPENDENT
- Although we will still have to build Platform/OS/Compiler/Bit dependent DLL/SO files to fulfill current IBIS specification, they only need to be built ONCE for model vendor and/or EDA vendor since it can be used for different DATA Files
- The DATA File will be easier to build. And it can be used for different data types that the Model or EDA vendor defines
- The DATA can be securely encrypted with advanced encryption algorithms. It is even more secured than software executable.

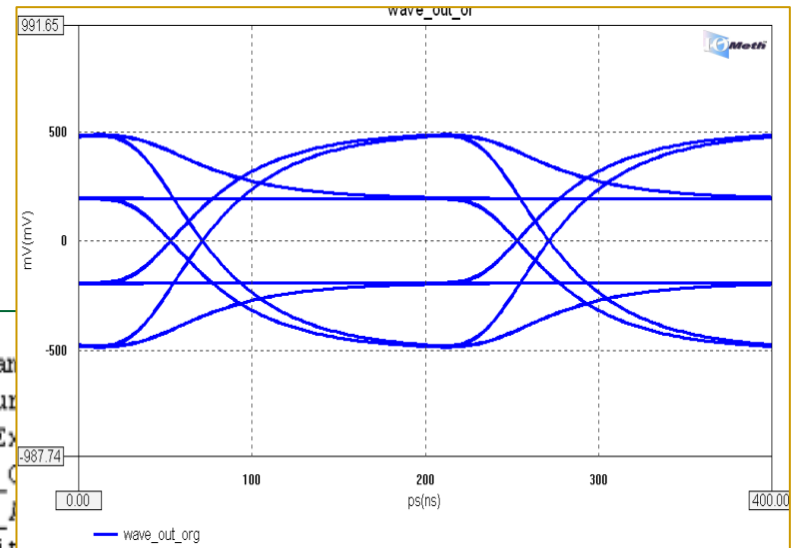
# Test case for AMI models with DATA Files



```

1 (TestEmphasis
2   (Reserved_Param
3     (Init_Return
4     (GetWave_Ex
5     (Use_Init_C
6     (Max_Init_A
7     (Ignore_Bit
8   )
9   (Model_Specific
10    (DATA_File
11      (Usage In) (Type String)
12      (Format Value "/data/AMI_Test/AMI_SPICE_ENC.dat")
13      (Description "AMI DATA file for Spice preemphasis Tx)
14    )
15    (NumBitsToAvg (Usage In) (Type Integer) (Format Value 200)
16    (TargetV (Usage In) (Type Float) (Format Value 0.15) (Defa
17    (ThresholdV (Usage In) (Type Float) (Format Value 0.015) (

```



# Summary

- This presentation introduces a DATA File method for IBIS AMI models
  - The DATA File is easier to be created by modeler
  - The DATA File can be very secure through advanced encryption technologies
  - The DLL/SO will only be made by software professional ONCE
- This method is currently supported by IBIS specification



The Modeling Specialist

**Developing the methodologies  
to make IBIS modeling easy and  
accurate**

<http://www.iometh.com>