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BIRD ID#: 121.2

ISSUE TITLE: IBIS-AMI New Reserved Parameters for Data Management

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DATE ACCEPTED BY IBIS OPEN FORUM:

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STATEMENT OF THE ISSUE:

Model developers and EDA vendors building IBIS-AMI models using the IBIS 5.0 specification have come across a number of modeling issues that are not addressed in IBIS 5.0. In order to deliver models and EDA tools that meet end-user demands for model accuracy and functionality, EDA vendors have defined "extensions" to add new capabilities to IBIS-AMI models. Unfortunately, EDA vendors have had to use proprietary (and different) syntax to add these capabilities to models, limiting model portability between different EDA tools.

This BIRD proposes new syntax for the .ami control file that improves model functionality and accuracy. Including this syntax in the IBIS standard will allow creation of accurate, compliant IBIS-AMI models that are readily portable between commercial EDA simulators.

The parameters defined in this document are to be added in Section 6c of the IBIS

5.0 specification as new Reserved\_Parameters:

Data Management & Simulation Control

Supporting\_Files, DLL\_Path, DLL\_ID

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Data Management & Simulation Control Parameters

"Supporting\_Files" is an AMI parameter of Type String, Usage Info, Format List that contains a list of the files and directories that the model requires in addition to the DLL or shared object file. In the specified List, each String is the relative path from the .ibs file directory to one supporting file or directory. The IBIS 5.0 specification already requires that the DLL and .ami file reside in the same directory as the .ibs file. Files and directories required by the DLL shall reside in this same directory. When copying a .ibs file to a project or library directory, the EDA tool or library utility should also copy the DLL and .ami files referenced by the .ibs file, and the supporting files and directories specified in “Supporting Files”

Example:

Table

(Supporting\_Files (Usage Info)(Type String)

 (List "my\_stuff\_dir" "m1.s4p" "m2.s4p" "m3.s4p")

 (Description "Additional files that support this model")

)

"DLL\_Path" is an AMI parameter of Type String, Usage In and format Value that gives the model the path to the directory where the DLL resides. In order for a DLL to be able to access Supporting Files, it requires the path to the directory where the DLL resides.

Example:

(DLL\_Path (Usage In)(Type String)(Value "NA")

 (Description "Path to where the DLL is running")

 )

The EDA tool is responsible for recognizing this parameter name and replacing the value declared in the .ami file with a string that contains the correct path information for the algorithmic model. In this string, the path separator is the forward slash ("/"), and the model is responsible for making any OS-specific adjustments (for example, replacing forward slashes "/" with backslashes "\" if necessary). The Value specified in the .ami file shall be ignored by the EDA tool. The value of DLL\_Path passed to the DLL can either be an absolute path, or a path relative to the current working directory of the simulation. The last character of the value passed to the DLL shall not be a forward slash (“/”). To access a supporting file, the DLL should create a file name by creating a string consisting of the value of DLL\_Path, convert “/” to “\” on operating systems that require a “\” as a path delimeter, append a “/” or “\” as appropriate to the operating systems, and then append the name of the file.

DLL\_ID

"DLL\_ID" is an AMI parameter of Type String, Usage In and format Value that is guaranteed to have a unique name for each instance of an IBIS-AMI model and simulation run in a single results directory.

Example:

(DLL\_ID (Usage In)(Type String)(Value "NA")

 (Description "Unique base name for each AMI model instance and run")

 )

The EDA tool is responsible for recognizing this parameter name and replacing the value declared in the .ami file with a string that contains a unique alphanumeric identifier. The algorithmic model is responsible for using DLL\_ID as the base name for any data files that the model creates, either for use as temporary storage or for recording output data. The use of DLL\_ID helps guarantee that multiple instances of the same model (or different models from the same vendor) do not mix up data as a result collisions between temporary or permanent file names.

DLL\_ID can optionally be used to create a standardized ASCII report file that EDA tools can parse and display. This report file has the base name of DLL\_ID and extension ".report". For example, if the value of DLL\_ID was set to "base\_sim.Rx1.dll", then the name report file created would be "base\_sim.Rx1.dll.report". The report file is ASCII and may contain lines that begin with the keyword "Result", followed by two fields, a <parameter name> and a <value>. There is no restriction that the <parameter name> be the name of a declared AMI parameter. The <value> may either be a string or a number. No two Result records in a DLL Report file may have the same <parameter name>. If either <parameter name> or <value> is a string that has embedded white space or ",", then the <parameter name> or <value> must be surrounded by two double quotes ("). Double quotes (") are not permitted within <parameter name> or <value>.

The DLL Report file is not required to exist, may be empty or may have any number of Result records. The format of the .report file is defined to make it easier for EDA tools and/or user scripts to parse and report on specific contents of a DLL\_ID.report file. The model may convey additional information in this file, but these ASCII records should not begin with the keyword "Result".

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ANALYSIS PATH/DATA THAT LED TO SPECIFICATION

The parameters defined in this BIRD came from commercial IBIS-AMI model development efforts where new functionality was needed to meet customer expectations for model functionality, accuracy and performance. The parameters in this BIRD were defined by SiSoft and its semiconductor partners. These parameters are being contributed to IBIS to ensure IBIS-AMI model accuracy and portability.

Samples\_Per\_Bit was removed. It is the responsibility of the model to be able to handle any number of Samples\_Per\_Bit.

DLLPath is changed to DLL\_Path.

DLLid is changed to DLL\_ID.

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ANY OTHER BACKGROUND INFORMATION:

This BIRD is being requested by the following IBIS users and model developers, in conjunction with the authors:

Cisco Systems: Upen Reddy, Doug White

Ericsson: Anders Ekholm

Broadcom: Yunong Gan

IBM: Adge Hawes

TI: Alfred Chong, Srikanth Sundaram

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