BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)

BIRD NUMBER: TBD
ISSUE TITLE: Clarification of Usage Out, InOut and Info for IBIS AMI
REQUESTOR: Arpad Muranyi, Mentor Graphics
DATE SUBMITTED: TBD
DATE REVISED:
DATE ACCEPTED BY IBIS OPEN FORUM: TBD

STATEMENT OF THE ISSUE:

The IBIS specification allows Model_Specific parameters to be (Usage Out/InOut/Info) which opens the door for AMI models to include non-standard, EDA tool specific features. This can undermine the IBIS specification's promise of model portability and interoperability. However, without these parameter types the IBIS specification would become less flexible, especially in the area of bleeding edge technologies and innovation when new features and capabilities are not available in the specification.

ANALYSIS PATH/DATA THAT LED TO SPECIFICATION:

One possible solution would have been to reduce the number of allowed Usage types for Model_Specific parameters so that models would be guaranteed to be portable or interoperable and let model makers and EDA vendors work outside the specification with non-standard model features until the specification incorporates the new features. But the issue was raised that the process of adopting new features is very slow in IBIS and there is a need to support non-standard, EDA tool specific capabilities in the IBIS specification on a temporary bases. Ideas on how to make the specification more flexible in different ways were also discussed, but will not be captured here due to the complexity of the topic.

More recent conversations revealed that the issue is really a communications or expectations problem. The natural expectation of an end user is that all IBIS models should work in all IBIS simulators, since IBIS is a specification of a behavioral buffer modeling standard. If certain models don't work in a simulator, the end user will tend to complain to the model maker or the EDA tool vendor or both, which is uncomfortable to all parties involved. However, if the IBIS model had a way to communicate to the user that the model includes non-standard features and will only work in certain simulators, the end user will know what to expect from the model and how to use the model successfully.

The resolution below reflects the decisions made in these discussions.

ANY OTHER BACKGROUND INFORMATION:

The issue was first brought up in March 2011 in the Advanced Technology Modeling Task Group. The initial BIRD draft was written with respect to IBIS v5.0 and included two issues. One of these was the problem that the specification was vague about which AMI function would return the values Usage Out or InOut parameters. This problem was indirectly addressed by subsequent revisionas of the IBIS specification, and as a result this topic was removed from this version of the BIRD draft.

The discussion of this topic was tabled in the summer of 2011 in the ATM Task Group due to higher priority issues needing to be resolved. Discussion on this topic resumed in the summer of 2015 when the ATM group decided to check whether this issue was still valid or not. The decision described in the "ANALYSIS PATH/DATA THAT LED TO SPECIFICATION " section above is the result of that effort.

Add the following new keyword to the **GENERAL RESERVED PARAMETERS** section which begins on pg 202:

Parameter: **VendorSpecificParams**

Required: No, and illegal before AMI_Version ?.?

Direction: Rx, Tx

Descriptors:

Usage:	Info
Type:	String
Format:	Value, List
Default:	<string_literal>
Description:	<string>

Definition: This reserved parameter tells the EDA tool which Model_Specific parameter(s) rely on non-IBIS-standard features in the EDA tool, and consequently may not be supported by all EDA tools.

Usage Rules: If the .ami file in which this reserved parameter appears contains any Model_Specific parameters associated with non-IBIS-standard model behaviors or features in the AMI model, the name of all such Model_Specific parameters must be listed in this reserved parameter. If this reserved parameter is not present in the .ami file, the AMI model is expected to be fully IBIS specification compliant and portable among all IBIS compliant EDA tools.

Other Notes: When such and such then this and that.

Examples:

```
(VendorSpecificParams (Usage Info) (Value "MyParam1") (Type String)
         (Description "This parameter only works in my simulator.")
)

(VendorSpecificParams (Usage Info) (List "MyParam1" "MyParam2") (Type String)
         (Description "This parameter only works in my simulator.")
)
```

Notes from the ATM meetings:

```
Consider adding new reserved parameters to indicate whether a model
uses proprietary features:

New Reserved parameter:  Proprietary=0/1
New Reserved parameter:  Interoperability <All|VendorName>
New Reserved parameter:  ProprietaryParameters <ListOfPropModSpecParams>

New Reserved parameter:  Extensions=0/1
New Reserved parameter:  VendorSpecific=0/1
    Bob: Boolean with list of parameter name
    optional
    allow Reserved parameters to be VendorSpecific
      (parser ignores it if marked as such)
```