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Buffer Issue Resolution Document (BIRD)
BIRD ID#:   {TBD}
ISSUE TITLE: Format Corner and Range Clarification for IBIS AMI
REQUESTOR: Arpad Muranyi, Mentor Graphics
DATE SUBMITTED: June 21, 2011
DATE REVISED:
DATE ACCEPTED BY IBIS OPEN FORUM:

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STATEMENT OF THE ISSUE:

The IBIS 5.0 specification is very vague on pg. 140 and 141 with the
description of the various Format types, especially Corner. The rules
on how Corner is expected to works with the simulator's corner setting
is unclear and needs explanation.

In addition, the definition on pg. 140 shows three values for Corner:
Corner <typ value> <slow value> <fast value>, while on pg. 147 the
definition of Rx_Receiver_Sensitivity only shows two values:
(Format Corner <slow> <fast>). This inconsistency cannot be resolved
by an EDA tool without additional information which is not available.

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STATEMENT OF THE RESOLVED SPECIFICATIONS:

On pg. 140 replace these lines:

```
|   Format: (default is range)
|     Value     <value> Single value data
|     Range     <typ value> <min value> <max value>
|     List      <typ value> <value> <value> <value> ... <value>
|     Corner    <typ value> <slow value> <fast value>
```

with these lines:

```
|   Format: (default is range)
|     Value     <value> Single value data
|*              The user may assign any value without any restrictions
|*              within the constraints of the Type of the variable
|     Range     <typ value> <min value> <max value>
|*              This defines a continuous range for which the user may
|*              select any value greater than or equal to <min value>
|*              and less than or equal to <max value> within the
|*              constraints of the Type of the variable
|     List      <typ value> <value> <value> <value> ... <value>
|*              This defines a discrete set of values from which the user
|*              may select one value
|     Corner    <typ value> <slow value> <fast value>
|*              The selection of one value is automatically carried out
|*              by the EDA tool based on its internal simulation corner
|*              setting
```

On pg. 141 replace these lines:

| Note that in the context of Algorithmic Model for type 'Corner', <slow
| value> and <fast value> align implicitly to slow and fast corners, and
| <slow value> does not have to be less than <fast value>. For type 'Range'
| and 'Increment', <min value>, <max value> does not imply slow and fast
| corners.

with these lines:

| Note that for Format Corner AMI parameters, the selection of one of the
| three possible values (<typ value>, <slow value>, <fast value>) is done
| by the EDA tool based on its internal IBIS [Model] corner setting.
| Since the IBIS specification does not define how exactly an EDA tool
| should pick from the various types of min and max data in the .ibs
| file to achieve slow and fast simulation results, the exact method of
| how <typ value>, <slow value> and <fast value> from Format Corner AMI
| parameters should be associated with the EDA tool's corner setting
| cannot be defined here. However, it is recommended that the typ, min,
| max (or similar) IBIS [Model] corner settings should be associated with
| the <typ value>, <slow value>, <fast value> in Format Corner AMI
| parameters, respectively. For AMI parameters <slow value> does not have
| to be less than <fast value>. For type 'Range' and 'Increment', <min
| value>, <max value> does not imply slow and fast corners.

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ANALYSIS PATH/DATA THAT LED TO SPECIFICATION:

It was determined in the May 17, 2011 IBIS ATM teleconference that the example on pg. 147 was clearly a typo. BIRD 127.1 was issued to incorporate the correction for that oversight.

The changes documented in this BIRD are also based on the discussions which took place in the IBIS ATM teleconference and subsequent emails.

There was an extensive discussion in IBIS ATM teleconferences and emails about the problem that the IBIS specification deliberately leaves "fast" and "slow" undefined (see discussion on C_comp in Section 9, Notes on Data Derivation Method). These discussions concluded (on June 21, 2011 in the ATM teleconference) that until the analog modeling in IBIS solves this ambiguity, the method of associating the AMI Format Corner with the analog model corners will be left to the EDA tool vendors.

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ANY OTHER BACKGROUND INFORMATION:

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