Can IBIS Accurately Model SSO?

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Can IBIS Accurately Model SSO?

- Sometimes …
- Issues Include
  - Accurate IBIS model
  - Accurate Package model
  - What does Simulator do with crossover current?
    - Voltage/Current on IO Pin can be correct
    - Voltage/Current on Power Node?
    - Voltage/Current on Ground Node?
- Do we need IT tables?
  - Added complexity
  - May be difficult to bench characterize
  - Contains required current information
What Is SSO

- Two major contributors to Simultaneous Switching Outputs
  - Inductance in Power/Ground of Package causes rails collapse
  - Coupling in Package Signal path can also cause pull-in or push-out
A Simple Circuit
Voltage - Pin of I/O Buffer

IBIS versus Spice
Current - Pin of I/O Buffer

IBIS (red) vs. SPICE (blue)
Current - I/O Pin

IBIS (red) vs. Spice (blue)
Current - I/O pin
Current - Power Node of I/O Buffer

IBIS (red) vs. SPICE (blue)
Current - Power Pin

IBIS (red) vs. Spice (blue)
Current - Power pin
Current - Ground Node of I/O Buffer
Complex SSO (SPICE simulation)
Summary

• Can IBIS model SSO?
  - Sometimes
  - On-die power network (decoupling) critical
  - Buyer beware
• Are IT tables the answer?
  - Clearly current is an issue
  - Work for another day...
Additional Resources

• Plug for the IBIS Quality Committee!
  - IQ_Specification.txt
  - IQ_Example.ibs
  - IQ_Checklist.xls

• Mailing list
  - Ibis-quality@freelists.org

• Web site
  - http://www.sisoft.com/ibis-quality/docs

• Questions ?