

OA Tidbits

I realize OA (or any such design database) may be new to most of you but it is very useful to learn basics of how these work. All commercial EDA tools are built on top of these and digital designers often write scriptware or codeware to directly manipulate them.

Few small clarifications about OA:

1. An OA design holds connectivity information such as nets, terms, etc., and layout information such as shapes. An inst is an object in a design that refers to another design. Designs containing insts, which refer to other designs, is how OpenAccess represents hierarchy. Insts do not have any connectivity or shape information in them. The design that contains the inst is called the parent. The design the inst refers to is called the master. Think of an inst as a pointer to the actual design.
2. Module domain is a representation of the logical structure only (e.g., coming from logic synthesis). Block data contains connectivity, plus it can have physical implementation specifics such as shapes, wires, and parasitics. Occurrence is an “unfolded” object which can be annotated with parasitics or custom information but cannot be edited for connectivity. Think of it as a way to store custom data for different instantiations of the *same* design. E.g., parasitics near the periphery of a block may change depending on surroundings outside the block in multiple instantiations.
3. The NameSpace encapsulates a set of rules for interpreting legal names within an application. oaNameSpace could be one of LEF/DEF/Verilog/VHDL/SPEF, etc. OA does the name mapping for you. For example, you can read a Verilog file and export a DEF file for the same design. The naming conventions for Verilog and DEF are very different (what are special characters, keywords, how are vectors represented, etc). Mostly you can stick to oaNativeNS in your code.
4. An InstTerm corresponds to connection of a term from the master of the Inst. Not all Terms have InstTerms. E.g., There may be flipflop whose Q_bar output term may be unconnected. When that flipflop is instantiated as an Inst, an InstTerm would be created for Q but not for Q_bar.