



Managing Hardware Design Workareas by Srinath Anantharaman, ClioSoft

With increasing design complexities and development spread across multiple groups, often in different places, efficient management and synchronization of design data is now a necessity. Designers need:

- A data management product that addresses all stages of the design and is integrated with the EDA tools in use.
- A well-defined process that streamlines development without imposing undue overhead.

We focus here on one part of the process, namely setting up the design engineer's workarea. Using a common workarea has the drawbacks that it risks overwriting problems, fails to provide a stable environment, and causes a lot of confusion. It is much better for each engineer to have his or her own area. He or she can check out the design files to work on, make the necessary changes, and check the files back into the project repository afterward.

Physical Copies or Symbolic Links

Hardware design data files may vary in type and may be quite large. Although disk space is cheap these days, managing heterogeneous data files and moving large files around can still be a significant problem. It is therefore important to decide whether a workarea should contain physical copies of files or symbolic links.

Engineers working on the front end of a design are editing Verilog, VHDL, or C files. These are usually small text files, so a workarea with physical copies of them is most appropriate.

For back-end design with large libraries, the situation differs. A better approach here is to create a workarea where all the directories are physical, but the files are symbolic links to common libraries. When a file is checked out for editing, the link is broken and a physical copy is placed in the workarea. Engineers share the files except for the ones they have checked out for editing. For example, ClioSoft's SOS DM system supports the following popular models for creating such workareas:

- Links to latest: Symbolic links always point to the latest version of each file.
- Links to a common workarea: Symbolic links point to a central workarea with physical copies of files. A project administrator typically updates the common workarea at fixed times.

Smart Symbolic Links

ClioSoft has developed a Smart Cache server with the best features of both physical files and symbolic links. An engineer can create a workarea with symbolic links to a cache maintained by the server. It not only maintains a copy of all revisions of files being used by all the workareas, but also keeps count of how many symbolic links point to each version. Each engineer can create his/her workarea by specifying a rule to select revisions (called a revision search order). A revision is purged from the cache only when there are no links pointing to it.

Creating workareas with smart symbolic links has several advantages:

- Stable workarea until engineer chooses to update.
- Optimized use of disk space.
- Minimized network bandwidth for multi-site projects.

Hardware designers have more complex requirements than software designers for management tools in these days of huge projects involving large teams. Different stages of the design call for different tools as well as new approaches and combinations.

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