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Hog: an easy system to handle HDL on a git-based repository

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Coordinating firmware development among many international collaborators is becoming a very widespread problem in high-energy physics. Guaranteeing firmware synthesis reproducibility and assuring traceability of binary files is paramount.

We devised Hog - HDL on git, a set of Tcl and Shell scripts that tackles these issues and is deeply integrated with HDL IDEs, such as Xilinx Vivado Design Suite and ISE PlanAhead or Intel Quartus Prime, and all major simulation tools, like Siemens ModelSim or Aldec Riviera Pro.

Git is a very powerful tool and has been chosen as standard by several research institutions, including CERN. Hog perfectly integrates with git to assure an absolute control of HDL source files, constraint files, IDE and simulation settings. It guarantees traceability by automatically embedding the git commit SHA and a numeric version into the binary file, also automatically renamed.

Hog does not rely on any external tool apart from the HDL IDE and git, so it is extremely compatible and does not require any installation. Developers can get quickly up to speed: clone the repository, run the Hog script, work normally with the IDE.

The learning curve to use Hog for the users is minimal. Once the HDL project is created, developers can work on it either using the IDE graphical interface, or with the provided Shell scripts to run the workflow.

Hog works on Windows and Linux, supports IPbus, Sigasi and provides pre-made YAML files to set up a working Continuous Integration on GitLab (Hog-CI) with no additional effort, which runs the HDL implementation for the desired projects. Other features of Hog-CI are the automatic creation of tags and GitLab releases with timing and utilisation reports.

Currently, Hog is successfully used by several firmware projects within the High-Energy Physics community, e.g. in the ATLAS and CMS Phase-II upgrades.

Collaboration

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