What is SoCLib

- SoCLib is an open platform for virtual prototyping of multi-processors system on chip (MP-SoC).
- The core of the platform is a library of SystemC simulation models for virtual components (IP cores)
- The project started as an ANR-founded project. It is now maintained at ?Lip6

Technical features

The main concern is true interoperability between the SoCLib IP cores :

- All simulation models are written in SystemC, and can be simulated with the standard SystemC simulation environment distributed by the OSCI organization.
- Two types of models are available for each IP-core:
    - CABA (Cycle Accurate / Bit Accurate),
    - TLM-DT (Transaction Level Modeling with Distributed Time)

Availability

- All simulation models and most associated tools are distributed as free software.
- The SoCLib documentation is on this website

Embedded Os support

SoCLib platforms are able to run several operating systems:

- DNA/OS : DNA/OS is a micro-kernel for MPSoCs. It supersedes MutekA, and still provides the POSIX thread API.
- ?MutekH : Exo-kernel based OS for classical and heterogeneous MPSoCs with POSIX threads support
- ?NetBSD : Highly portable Unix-like Open Source operating system
- ?eCos : An open source, royalty-free, real-time operating system intended for embedded applications.
- ?RTEMS : Real-Time Operating System for Multiprocessor Systems

SoCLib Tools

Various tools comes along with SoCLib to ease research and development:

- DSX : Design Space Exploration tool
- SystemCASS : Fast SystemC simulation kernel
- SoCView : Interactive simulation environment for debug and instrumentation
- GdbServer : A GDB server for multi-processor architectures
- MemoryChecker : A memory access error checker similar to valgrind.
- GAUT : A high-level synthesis tool allowing to generate automatically systemC CABA and TLM-T files.

Middleware

- MWMR : Hardware / Software communication middleware

Using SoCLib

SoCLib Components

- SoCLib Components General Index : documentation about the available hardware components (IP cores)

Installation

- If you want to try SoCLib without going through the installation process, the ?SoCLib Virtual machine appliance may help you !
- Installation Notes : how to install the SoCLib platform on your computer
- Frequently asked questions is useful when things goes wrong

Building platforms

- Soclib Cc is the current build system for SoCLib platforms.
    - SoclibCc/DesignGuide is an attempt to justify the choices made in soclib-cc
    - Soclib Cc/And Modelsim describes how to use SoCLib CABA models in ModelSim, to make RTL+CABA co-simulation
    - Soclib Cc/Meta Data describes the metadata (`.sd`) file format
    - Soclib Cc/Soclib Conf describes the configuration file format

Tutorials

- ?DSX tutorial
- Motion-JPEG and OS tutorial

Development

Writing and design guides

- General SoCLib Rules : general rules regarding the SoCLib components.
- Processor Modeling : a general method to write generic processor models.

- CABA Writing Rules : rules to write SystemC CABA simulation models.
- TLM-DT Writing Rules : rules to write SystemC TLM-DT simulation models.
- Critères Pour Plate-Forme TLM-T : criteria defined for writing TLM-T simulation models.
- CABA/TLM-DT Transactors : general principles

- Adding new components to the library : the rules to follow to add a new IP core to the library.
- Vci Protocol : VCI protocol considerations in SoCLib

SoCLib Resources

Mailing list

The dev@? Mailing list is public and targets general discussion about SoCLib component development.

To join the list, either

- send an email to `dev-subscribe@soclib.fr`;
- see http://www.soclib.fr/wws/info/dev.