UNISIM
PowerPC G4 board Simulator Manual

Gilles Mouchard

1 Simulator technical reference (generated)

This documentation has been automatically generated from the simulator `UNISIM embedded-ppc-g4-board` version 1.1beta4 on Jun 24 2013.

1.1 Introduction

UNISIM embedded-ppc-g4-board simulator is a MPC7447A/MPC107 board simulator with support of ELF32, ELF64, S19, and RAW binaries and targeted for industrial applications.
Section 1.2 gives licensing informations about the simulator. Section 1.3 shows the set of modules and services that compose the simulator. Section 1.4 shows how to invoke the simulator at the command line prompt. Section 1.5 gives the simulator parameters. Section 1.6 gives the simulator statistic counters. Section 1.7 gives the simulator statistic formulas.

1.2 Licensing

Authors: Gilles Mouchard <gilles.mouchard@cea.fr>, Daniel Gracia Pérez <daniel.gracia-perez@cea.fr>

1.3 Simulated configuration

The UNISIM embedded-ppc-g4-board simulator is composed of the following modules and services:

- **bus**: Front side bus
- **cpu**: PowerPC MPC7447A CPU
- **debugger**
- **erom**: Memory
- **flash**: This module implements an AM29LV800BT flash memory with the following characteristics:
  Manufacturer ID: 0x010000
  Device ID word #0: 0xda2202
  Size: 4194304 bytes
  I/O width: 64 bits
  Number of chips: 4 chips
  I/O width per chip: 16 bits
  Size per chip: 1048576 bytes
  Number of Sectors: 19 sectors
  8-bit mode support: yes

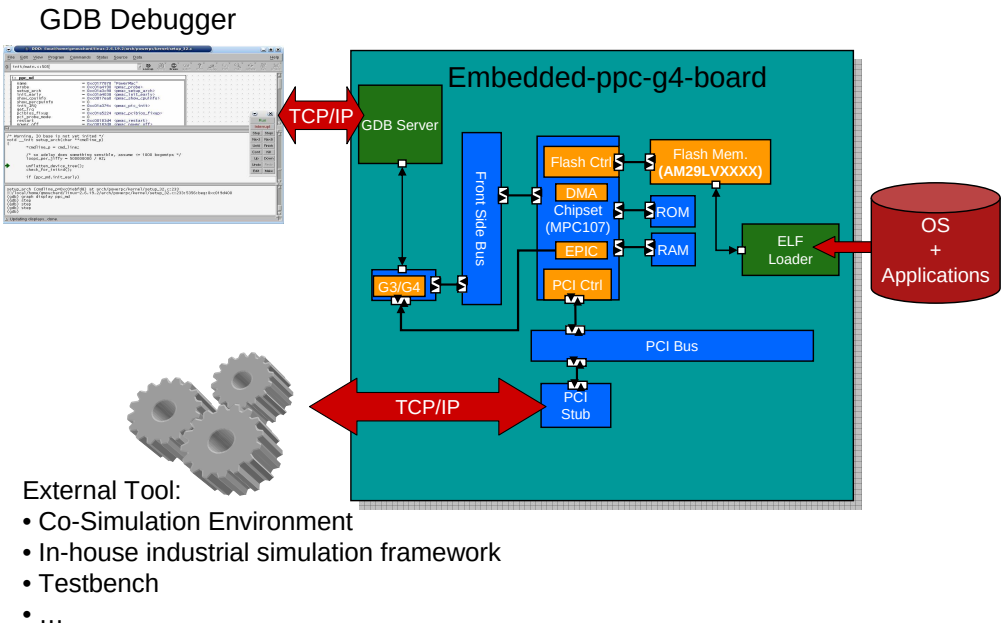

Figure 1: UNISIM embedded-ppc-g4-board simulator schematic.

16-bit mode support: yes
Access time: 70 ns
Byte programming time: 9000 us
Word programming time: 110000 us
Sector erasing time: 700000000 us
Chip erasing time: 14000000000 us

- **gdb-server**: this service implements the GDB server remote serial protocol over TCP/IP. Standards GDB clients (e.g. gdb, eclipse, ddd) can connect to the simulator to debug the target application that runs within the simulator.
- **host-time**: this service is an abstraction layer for the host machine time
- **inline-debugger**: this service implements a built-in debugger in the terminal console
- **loader**: A multi-format loader that supports ELF32, ELF64, S19, COFF and Raw binary files
- **loader.memory-mapper**: A memory mapper
- **loader.tee-backtrace**: This service/client implements a tee ('T'). It unifies the backtrace capability of several services that individually provides their own backtrace capability
- **loader.tee-blob**: This service/client implements a tee ('T'). It unifies the statement lookup capability of several services that individually provides their own statement lookup capability
- **loader.tee-loader**: This service/client implements a tee ('T'). It unifies the loader capability of several services that individually provides their own loader capability

- **loader.tee-stmt-lookup**: This service/client implements a tee ('T'). It unifies the statement lookup capability of several services that individually provides their own statement lookup capability
- **loader.tee-symbol-table-lookup**: This service/client implements a tee ('T'). It unifies the symbol table lookup capability of several services that individually provides their own symbol table lookup capability
- **memory**: Memory
- **mpc107**: MPC107 chipset
- **mpc107.DMA**: MPC107 integrated Direct Memory Access (DMA) controller
- **mpc107.address_mapper**: MPC107 Address mapper
- **mpc107.atu**: MPC107 integrated Address Translation Unit (ATU)
- **mpc107.epic**: MPC107 integrated Embedded Programmable Interrupt Controller (EPIC)
- **mpc107.pci_controller**: MPC107 integrated PCI bus controller
- **pci-bus**: PCI bus
- **pci-stub**: A module that implements a PCI target and acts as a co-simulation stub controlled over a TCP/IP or pipe connection.
- **profiler**
- **tee-memory-access-reporting**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[0]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[10]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[11]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[12]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[13]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[14]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[15]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[1]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[2]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[3]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[4]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[5]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[6]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[7]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[8]**
- **tee-memory-access-reporting.tee-memory-access-reporting.control_selector[9]**
- **tee-symbol-table-lookup**: This service/client implements a tee ('T'). It unifies the symbol table lookup capability of several services that individually provides their own symbol table lookup capability
- **time**: this service is an abstraction layer for the SystemC kernel time

1.4 Using the UNISIM embedded-ppc-g4-board simulator

The UNISIM embedded-ppc-g4-board simulator has the following command line options:

Usage: `unisim-embedded-ppc-g4-board-1.1beta4 [<options>] [...]`
Options:

- `--set <param=value> or -s <param=value>`: set value of parameter 'param' to 'value'
- `--config <XML file> or -c <XML file>`: configures the simulator with the given XML configuration file
- `--get-config <XML file> or -g <XML file>`: get the simulator configuration XML file (you can use it to create your own configuration. This option can be combined with -c to get a new configuration file with existing variables from another file
- `--list or -l`: lists all available parameters, their type, and their current value
- `--warn or -w`: enable printing of kernel warnings
- `--doc <Latex file> or -d <Latex file>`: enable printing a latex documentation
- `--version or -v`: displays the program version information
- `--share-path <path> or -p <path>`: the path that should be used for the share directory (absolute path)
- `--help or -h`: displays this help

1.5 Configuration

Simulator configuration (see below) can be modified using command line Options `--set <param=value>` or `--config <config file>`.

Global	
Name: `enable-gdb-server` **Default:** `true` **Valid:** `true`, `false` **Description:** Enable/Disable GDB server instantiation.	**Type:** `parameter` **Data type:** `boolean`
Name: `enable-inline-debugger` **Default:** `true` **Valid:** `true`, `false` **Description:** Enable/Disable inline debugger instantiation.	**Type:** `parameter` **Data type:** `boolean`
Name: `enable-press-enter-at-exit` **Default:** `false` **Valid:** `true`, `false` **Description:** Enable/Disable pressing key enter at exit.	**Type:** `parameter` **Data type:** `boolean`
Name: `estimate-power` **Default:** `false` **Valid:** `true`, `false`	**Type:** `parameter` **Data type:** `boolean`

Description:
Enable/Disable power estimators instantiation.

Name: `kernel_logger.file` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Keep logger output in a file.

Name: `kernel_logger.filename` **Type:** `parameter`
Default: `logger_output.txt` **Data type:** `string`

Description:
Filename to keep logger output _(the option file must be activated).

Name: `kernel_logger.std_err` **Type:** `parameter`
Default: `true` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Show logger output through the standard error output.

Name: `kernel_logger.std_err_color` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Colorize logger output through the standard error output _(only works if std_err is active).

Name: `kernel_logger.std_out` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Show logger output through the standard output.

Name: `kernel_logger.std_out_color` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Colorize logger output through the standard output _(only works if std_out is active).

Name: `kernel_logger.xml_file` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Keep logger output in a file xml formatted.

Name: `kernel_logger.xml_file_gzipped` **Type:** `parameter`
Default: `false` **Data type:** `boolean`

Valid: `true`, `false`

Description:
If the xml_file option is active, the output file will be compressed (a .gz extension will be automatically added to the xml_filename option.

Name: `kernel_logger.xml_filename` **Type:** `parameter`
Default: `logger_output.xml` **Data type:** `string`

Description:
Filename to keep logger xml output _(the option xml_file must be activated).

Name: `message-spy` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable message spies instantiation.

bus

Name: `bus.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `bus.cycle-time` **Type:** `parameter`
Default: `13332 ps` **Data type:** `sc_time`

Description:
cycle time.

cpu

Name: `cpu.cpu-cycle-time` **Type:** `parameter`
Default: `3333` **Data type:** `unsigned 64-bit integer`

Description:
CPU cycle time in picoseconds.

Name: `cpu.voltage` **Type:** `parameter`
Default: `1300` **Data type:** `unsigned 64-bit integer`

Description:
CPU voltage in mV.

Name: `cpu.max-inst` **Type:** `parameter`
Default: `18446744073709551615` **Data type:** `unsigned 64-bit integer`

Description:
maximum number of instructions to simulate.

Name: `cpu.verbose-all` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
globally enable/disable verbosity.

Name: `cpu.verbose-setup` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity while setup.

Name: `cpu.verbose-step` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when simulating an instruction.

Name: `cpu.verbose-dtlb` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when accessing data translation lookahead buffer.

Name: `cpu.verbose-itlb` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when accessing instruction translation lookahead buffer.

Name: `cpu.verbose-dl1` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when accessing L1 data cache.

Name: `cpu.verbose-il1` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when accessing L1 instruction cache.

Name: `cpu.verbose-l2` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when accessing L2 unified cache.

Name: `cpu.verbose-load` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when simulating a load.

Name: `cpu.verbose-store` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when simulating a store.

Name: `cpu.verbose-read-memory` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when reading memory for a debug purpose.

Name: `cpu.verbose-write-memory` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when writing memory for a debug purpose.

Name: `cpu.verbose-exception` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when handling exceptions.

Name: `cpu.verbose-set-msr` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when setting MSR.

Name: `cpu.verbose-set-hid0` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when setting HID0.

Name: `cpu.verbose-set-hid1` **Type:** `parameter`
Default: `false` **Data type:** `boolean`

Valid: `true`, `false`

Description:
enable/disable verbosity when setting HID1.

Name: `cpu.verbose-set-hid2` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when setting HID2.

Name: `cpu.verbose-set-l2cr` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity when setting L2CR.

Name: `cpu.enable-linux-printk-snooping` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable linux printk buffer snooping.

Name: `cpu.enable-linux-syscall-snooping` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable linux syscall snooping.

Name: `cpu.trap-on-instruction-counter` **Type:** `parameter`
Default: `18446744073709551615` **Data type:** `unsigned 64-bit integer`

Description:
number of simulated instruction before traping.

Name: `cpu.halt-on` **Type:** `parameter`
Default: **Data type:** `string`

Description:
Symbol or address where to stop simulation.

Name: `cpu.bus-cycle-time` **Type:** `parameter`
Default: `13332 ps` **Data type:** `sc_time`

Description:
bus cycle time.

Name: `cpu.nice-time` **Type:** `parameter`
Default: `1 ms` **Data type:** `sc_time`

Description:
maximum time between synchonizations.

Name: `cpu.ipc` **Type:** `parameter`
Default: `1` **Data type:** `double precision floating-point`

Description:
targeted average instructions per second.

debugger

Name: `debugger.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity.

Name: `debugger.dwarf-to-html-output-directory` **Type:** `parameter`
Default: **Data type:** `string`

Description:
DWARF v2/v3 to HTML output directory.

Name: `debugger.dwarf-register-number-mapping-filename` **Type:** `parameter`
Default: `powerpc_eabi_gcc_dwarf_register_number_mapping.xml` **Data type:** `string`

Description:
DWARF register number mapping filename.

Name: `debugger.parse-dwarf` **Type:** `parameter`
Default: `true` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable parsing of DWARF debugging informations.

Name: `debugger.debug-dwarf` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable debugging of DWARF.

erom

Name: `erom.org` **Type:** `parameter`
Default: `0x78000000` **Data type:** `unsigned 32-bit integer`

Description:
memory origin/base address.

Name: `erom.bytesize` **Type:** `parameter`
Default: `16777216` **Data type:** `unsigned 32-bit integer`

Description:
memory size in bytes.

Name: `erom.initial-byte-value` **Type:** `parameter`
Default: `0x00` **Data type:** `unsigned 8-bit integer`

Name: `erom.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `erom.cycle-time` **Type:** `parameter`
Default: `13332 ps` **Data type:** `sc_time`

Description:
RAM memory cycle time.

flash

Name: `flash.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `flash.org` **Type:** `parameter`
Default: `0xff800000` **Data type:** `unsigned 32-bit integer`

Description:
flash memory base address.

Name: `flash.bytesize` **Type:** `parameter`
Default: `8388608` **Data type:** `unsigned 32-bit integer`

Description:
flash memory size in bytes.

Name: `flash.endian`	**Type:** `parameter`
Default: `big-endian`	**Data type:** `endianess`
Valid: `little-endian`, `big-endian`	
Description: endianness of flash memory.	
Name: `flash.sector-protect[0]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[1]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[2]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[3]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[4]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[5]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	
Name: `flash.sector-protect[6]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: enable/disable sector write protection.	

Name: `flash.sector-protect[7]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[8]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[9]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[10]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[11]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[12]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[13]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	
Name: `flash.sector-protect[14]`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description:	
enable/disable sector write protection.	

Name: `flash.sector-protect[15]` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable sector write protection.

Name: `flash.sector-protect[16]` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable sector write protection.

Name: `flash.sector-protect[17]` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable sector write protection.

Name: `flash.sector-protect[18]` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable sector write protection.

Name: `flash.fsm-to-graphviz-output-filename` **Type:** `parameter`
Default: **Data type:** `string`

Description:
FSM (finite state machine) to Graphviz output filename.

Name: `flash.cycle-time` **Type:** `parameter`
Default: `13332 ps` **Data type:** `sc_time`

Description:
flash memory cycle time.

gdb-server

Name: `gdb-server.memory-atom-size` **Type:** `parameter`
Default: `0x00000001` **Data type:** `unsigned 32-bit integer`

Description:
size of the smallest addressable element in memory.

Name: `gdb-server.tcp-port` **Type:** `parameter`
Default: `0` **Data type:** `signed 32-bit integer`

Description:
TCP/IP port to listen waiting for a GDB client connection.

Name: `gdb-server.architecture-description-filename` **Type:** `parameter`
Default: `gdb_powerpc.xml` **Data type:** `string`

Description:
filename of a XML description of the connected processor.

Name: `gdb-server.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity.

inline-debugger

Name: `inline-debugger.memory-atom-size` **Type:** `parameter`
Default: `0x00000001` **Data type:** `unsigned 32-bit integer`

Description:
size of the smallest addressable element in memory.

Name: `inline-debugger.search-path` **Type:** `parameter`
Default: **Data type:** `string`

Description:
Search path for source (separated by ';').

Name: `inline-debugger.init-macro` **Type:** `parameter`
Default: **Data type:** `string`

Description:
path to initial macro to run when debugger starts.

Name: `inline-debugger.output` **Type:** `parameter`
Default: **Data type:** `string`

Description:
path to output file where to redirect the debugger outputs.

loader

Name: `loader.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity.

Name: `loader.verbose-parser` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity of parser.

Name: `loader.filename` **Type:** `parameter`
Default: **Data type:** `string`

Description:
List of files to load. Syntax: [[filename=]<filename1>[:[format=]<format1>]][,[filename=]<filename2>[:[form
(e.g. boot.bin:raw,app.elf).

loader.memory-mapper

Name: `loader.memory-mapper.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity.

Name: `loader.memory-mapper.verbose-`
`↪parser` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity of parser.

Name: `loader.memory-mapper.mapping` **Type:** `parameter`
Default: `mpc107:0x00000000-0xffffffff` **Data type:** `string`

Description:
Memory mapping. Syntax: [[(memory=]<memory1>[:[range=]<low1-high1>]][,[(memory=]<memory2>[:[range=]<low2-high2>]]... (e.g. ram:0x0-0x00ffff,rom:0xff0000-0xffffff).

memory

Name: `memory.org` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
memory origin/base address.

Name: `memory.bytesize` **Type:** `parameter`
Default: `268435456` **Data type:** `unsigned 32-bit integer`

Description:
memory size in bytes.

Name: `memory.initial-byte-value` **Type:** `parameter`
Default: `0x00` **Data type:** `unsigned 8-bit integer`

Name: `memory.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `memory.cycle-time` **Type:** `parameter`
Default: `13332 ps` **Data type:** `sc_time`

Description:
RAM memory cycle time.

mpc107

Name: `mpc107.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `mpc107.host_mode` **Type:** `parameter`
Default: `true` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable host mode.

Name: `mpc107.a_address_map` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable address map A.

Name: `mpc107.memory_32bit_data_bus_↪size` **Type:** `parameter`
Default: `true` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable 32-bit data bus width.

Name: `mpc107.rom0_8bit_data_bus_↪size` **Type:** `parameter`
Default: `false` **Data type:** `boolean`

Valid: `true`, `false`

Description:
enable/disable rom #0 8-bit data bus width.

Name: `mpc107.rom1_8bit_data_bus_↪size` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable rom #1 8-bit data bus width.

Name: `mpc107.frequency` **Type:** `parameter`
Default: `75` **Data type:** `unsigned 32-bit integer`

Description:
frequency in Mhz.

Name: `mpc107.sdram_cycle_time` **Type:** `parameter`
Default: `13332` **Data type:** `unsigned 64-bit integer`

Description:
SDRAM cycle time in picoseconds.

mpc107.DMA

Name: `mpc107.DMA.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
Enable/Disable verbosity.

mpc107.address_mapper

Name: `mpc107.address_mapper.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

mpc107.atu

Name: `mpc107.atu.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

mpc107.epic

Name: `mpc107.epic.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`

Valid: `true`, `false`

Description:
enable/disable verbosity.

mpc107.pci_controller

Name: `mpc107.pci_controller.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

pci-bus

Name: `pci-bus.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Description:
enable/disable verbosity.

Name: `pci-bus.num-mappings` **Type:** `parameter`
Default: `1` **Data type:** `unsigned 32-bit integer`

Description:
total number of address mappings.

Name: `pci-bus.base-address[0]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: base address of mapped device.

Name: `pci-bus.base-address[1]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: base address of mapped device.

Name: `pci-bus.base-address[2]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: base address of mapped device.

Name: `pci-bus.base-address[3]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: base address of mapped device.

Name: `pci-bus.base-address[4]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: base address of mapped device.	
Name: `pci-bus.base-address[5]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: base address of mapped device.	
Name: `pci-bus.base-address[6]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: base address of mapped device.	
Name: `pci-bus.size[0]`	**Type:** `parameter`
Default: `1073741824`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.size[1]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.size[2]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.size[3]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.size[4]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	

Name: `pci-bus.size[5]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.size[6]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: size in bytes of mapped device.	
Name: `pci-bus.device-number[0]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.device-number[1]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.device-number[2]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.device-number[3]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.device-number[4]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.device-number[5]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	

Name: `pci-bus.device-number[6]`	**Type:** `parameter`
Default: `0x00000000`	**Data type:** `unsigned 32-bit integer`
Description: mapping: device number.	
Name: `pci-bus.target-port[0]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[1]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[2]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[3]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[4]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[5]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	
Name: `pci-bus.target-port[6]`	**Type:** `parameter`
Default: `0`	**Data type:** `unsigned 32-bit integer`
Description: mapping: target port number.	

Name: `pci-bus.register-number[0]` **Type:** `parameter`
Default: `0x00000010` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[1]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[2]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[3]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[4]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[5]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.register-number[6]` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
mapping: BAR offset in PCI device configuration space.

Name: `pci-bus.addr-type[0]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[1]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[2]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[3]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[4]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[5]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.addr-type[6]` **Type:** `parameter`
Default: `mem` **Data type:** `pci space`
Valid: `mem`, `i/o`, `cfg`

Description:
mapping: address space type.

Name: `pci-bus.frequency` **Type:** `parameter`
Default: `33` **Data type:** `unsigned 32-bit integer`

Description:
frequency in Mhz.

pci-stub

Name: `pci-stub.verbose` **Type:** `parameter`
Default: `false` **Data type:** `boolean`
Valid: `true`, `false`

Name: `pci-stub.is-server` **Type:** `parameter`

Default: false **Valid:** true, false	**Data type:** boolean
Name: pci-stub.protocol **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.pipe-name **Default:** pipe	**Type:** parameter **Data type:** string
Name: pci-stub.server-name **Default:** localhost	**Type:** parameter **Data type:** string
Name: pci-stub.tcp-port **Default:** 0x00003039	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪0] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪1] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪2] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪3] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪4] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↪5] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.address-space[0] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space
Name: pci-stub.address-space[1] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space
Name: pci-stub.address-space[2] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space

Name: pci-stub.address-space[3] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space
Name: pci-stub.address-space[4] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space
Name: pci-stub.address-space[5] **Default:** mem **Valid:** mem, i/o, cfg	**Type:** parameter **Data type:** pci space
Name: pci-stub.region-size[0] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.region-size[1] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.region-size[2] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.region-size[3] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.region-size[4] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.region-size[5] **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.pci-device-number **Default:** 0x00000000	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.pci-bus-frequency **Default:** 0x00000021	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: pci-stub.bus-frequency **Default:** 0x0000004b	**Type:** parameter **Data type:** unsigned 32-bit integer

profiler

Name: profiler.min-data-read-prof- ↪addr **Default:** 0x00000000 **Description:** Minimum address for data read profiling.	**Type:** parameter **Data type:** unsigned 32-bit integer
Name: profiler.max-data-read-prof- ↪addr	**Type:** parameter

Default: `0xffffffff` **Data type:** `unsigned 32-bit integer`

Description:
Maximum address for data read profiling.

Name: `profiler.min-data-write-prof-addr` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
Minimum address for data write profiling.

Name: `profiler.max-data-write-prof-addr` **Type:** `parameter`
Default: `0xffffffff` **Data type:** `unsigned 32-bit integer`

Description:
Maximum address for data write profiling.

Name: `profiler.min-insn-fetch-prof-addr` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
Minimum address for instruction fetch profiling.

Name: `profiler.max-insn-fetch-prof-addr` **Type:** `parameter`
Default: `0xffffffff` **Data type:** `unsigned 32-bit integer`

Description:
Maximum address for instruction fetch profiling.

Name: `profiler.min-insn-exec-prof-addr` **Type:** `parameter`
Default: `0x00000000` **Data type:** `unsigned 32-bit integer`

Description:
Minimum address for instruction execution profiling.

Name: `profiler.max-insn-exec-prof-addr` **Type:** `parameter`
Default: `0xffffffff` **Data type:** `unsigned 32-bit integer`

Description:
Maximum address for instruction execution profiling.

Name: `profiler.enable-data-read-↪prof`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: Enable/Disable data read profiling.	
Name: `profiler.enable-data-write-↪prof`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: Enable/Disable data write profiling.	
Name: `profiler.enable-insn-fetch-↪prof`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: Enable/Disable instruction fetch profiling.	
Name: `profiler.enable-insn-exec-↪prof`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: Enable/Disable instruction execution profiling.	
Name: `profiler.verbose`	**Type:** `parameter`
Default: `false`	**Data type:** `boolean`
Valid: `true`, `false`	
Description: Enable/Disable verbosity.	

1.6 Statistics

Simulation statistic counters are listed below:

cpu	
Name: `cpu.instruction-counter`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of simulated instructions.	
Name: `cpu.bus-cycle`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of simulated bus cycles.	

Name: `cpu.num-il1-accesses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of accesses to L1 instruction cache.	
Name: `cpu.num-il1-misses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of misses to L1 instruction cache.	
Name: `cpu.num-dl1-accesses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of accesses to L1 data cache.	
Name: `cpu.num-dl1-misses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of misses to L1 data cache.	
Name: `cpu.num-l2-accesses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of accesses to unified L2 cache.	
Name: `cpu.num-l2-misses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of misses to unified L2 cache.	
Name: `cpu.num-ibat-accesses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of accesses to IBATs.	
Name: `cpu.num-ibat-misses`	**Type:** `statistic` **Data type:** `unsigned 64-bit integer`
Description: number of misses to IBATs.	

Name: `cpu.num-dbat-accesses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of accesses to DBATs.

Name: `cpu.num-dbat-misses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of misses to DBATs.

Name: `cpu.num-itlb-accesses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of accesses to ITLB.

Name: `cpu.num-itlb-misses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of misses to ITLB.

Name: `cpu.num-dtlb-accesses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of accesses to DTLB.

Name: `cpu.num-dtlb-misses` **Type:** `statistic`
Data type: `unsigned 64-bit integer`

Description:
number of misses to DTLB.

erom

Name: `erom.memory-usage` **Type:** `statistic`
Data type: `unsigned 32-bit integer`

Description:
target memory usage in bytes (page granularity of 1048576 bytes).

memory

Name: `memory.memory-usage` **Type:** `statistic`
Data type: `unsigned 32-bit integer`

Description:
target memory usage in bytes (page granularity of 1048576 bytes).

1.7 Formulas

Simulation statistic formulas are listed below:

cpu	
Name: cpu.il1-miss-rate **Formula:** cpu.num-il1-misses / cpu.num-il1-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.dl1-miss-rate **Formula:** cpu.num-dl1-misses / cpu.num-dl1-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.l2-miss-rate **Formula:** cpu.num-l2-misses / cpu.num-l2-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.ibat-miss-rate **Formula:** cpu.num-ibat-misses / cpu.num-ibat-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.dbat-miss-rate **Formula:** cpu.num-dbat-misses / cpu.num-dbat-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.itlb-miss-rate **Formula:** cpu.num-itlb-misses / cpu.num-itlb-accesses	**Type:** formula **Data type:** double precision floating-point
Name: cpu.dtlb-miss-rate **Formula:** cpu.num-dtlb-misses / cpu.num-dtlb-accesses	**Type:** formula **Data type:** double precision floating-point