

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 1.1beta3 on Sep 12 2012.

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

UNISIM `embedded-ppc-g4-board` 1.1beta3

Copyright (C) 2007-2011, Commissariat a l'Energie Atomique (CEA)

License: BSD (see file COPYING)

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

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-1.1beta3 [<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: <code>enable-gdb-server</code>	Type: parameter
Default: <code>true</code>	Data type: boolean
Valid: <code>true, false</code>	

Description: Enable/Disable GDB server instantiation.	
Name: enable-inline-debugger	Type: parameter
Default: true	Data type: boolean
Valid: true, false	
Description: Enable/Disable inline debugger instantiation.	
Name: enable-press-enter-at-exit	Type: parameter
Default: false	Data type: boolean
Valid: true, false	
Description: Enable/Disable pressing key enter at exit.	
Name: estimate-power	Type: parameter
Default: false	Data type: boolean
Valid: true, false	
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 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: Colorize logger output through the standard output _(only works if std_out is active).	
Name: kernel_logger.xml_file Default: false Valid: true, false	Type: parameter Data type: boolean
Description: Keep logger output in a file xml formatted.	
Name: kernel_logger.xml_file_gzipped Default: false Valid: true, false	Type: parameter Data type: boolean
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 Default: logger_output.xml	Type: parameter Data type: string
Description: Filename to keep logger xml output _(the option xml_file must be activated).	
Name: message-spy Default: false Valid: true, false	Type: parameter Data type: boolean
Description: Enable/Disable message spies instantiation.	
bus	
Name: bus.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity.	
Name: bus.cycle-time Default: 13332 ps	Type: parameter Data type: sc_time
Description: cycle time.	

cpu	
Name: cpu.cpu-cycle-time Default: 3333	Type: parameter Data type: unsigned 64-bit integer
Description: CPU cycle time in picoseconds.	
Name: cpu.voltage Default: 1300	Type: parameter Data type: unsigned 64-bit integer
Description: CPU voltage in mV.	
Name: cpu.max-inst Default: 18446744073709551615	Type: parameter Data type: unsigned 64-bit integer
Description: maximum number of instructions to simulate.	
Name: cpu.verbose-all Default: false Valid: true, false	Type: parameter Data type: boolean
Description: globally enable/disable verbosity.	
Name: cpu.verbose-setup Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity while setup.	
Name: cpu.verbose-step Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when simulating an instruction.	
Name: cpu.verbose-dtlb Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when accessing data translation lookahead buffer.	
Name: cpu.verbose-itlb Default: false Valid: true, false	Type: parameter Data type: boolean

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 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when setting MSR.	
Name: cpu.verbose-set-hid0 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when setting HID0.	
Name: cpu.verbose-set-hid1 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when setting HID1.	
Name: cpu.verbose-set-hid2 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when setting HID2.	
Name: cpu.verbose-set-l2cr Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity when setting L2CR.	
Name: cpu.enable-linux-printk-snooping Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable linux printk buffer snooping.	
Name: cpu.enable-linux-syscall-snooping Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable linux syscall snooping.	
Name: cpu.trap-on-instruction-counter Default: 18446744073709551615	Type: parameter Data type: unsigned 64-bit integer

Description: number of simulated instruction before trapping.	
Name: <code>cpu.halt-on</code> Default:	Type: parameter Data type: string
Description: Symbol or address where to stop simulation.	
Name: <code>cpu.bus-cycle-time</code> Default: 13332 ps	Type: parameter Data type: sc_time
Description: bus cycle time.	
Name: <code>cpu.nice-time</code> Default: 1 ms	Type: parameter Data type: sc_time
Description: maximum time between synchronizations.	
Name: <code>cpu.ipc</code> Default: 1	Type: parameter Data type: double precision floating-point
Description: targeted average instructions per second.	
debugger	
Name: <code>debugger.verbose</code> Default: false Valid: true, false	Type: parameter Data type: boolean
Description: Enable/Disable verbosity.	
Name: <code>debugger.dwarf-to-html-output- ↔directory</code> Default:	Type: parameter Data type: string
Description: DWARF v2/v3 to HTML output directory.	
Name: <code>debugger.dwarf-register-number- ↔mapping-filename</code> Default: <code>powerpc_eabi_gcc_dwarf_register_</code> <code>↔number_mapping.xml</code>	Type: parameter Data type: string

Description: DWARF register number mapping filename.	
Name: debugger.parse-dwarf Default: true Valid: true, false	Type: parameter Data type: boolean
Description: Enable/Disable parsing of DWARF debugging informations.	
erom	
Name: erom.org Default: 0x78000000	Type: parameter Data type: unsigned 32-bit integer
Description: memory origin/base address.	
Name: erom.bytesize Default: 16777216	Type: parameter Data type: unsigned 32-bit integer
Description: memory size in bytes.	
Name: erom.initial-byte-value Default: 0x00	Type: parameter Data type: unsigned 8-bit integer
Name: erom.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity.	
Name: erom.cycle-time Default: 13332 ps	Type: parameter Data type: sc_time
Description: RAM memory cycle time.	
flash	
Name: flash.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable verbosity.	
Name: flash.org Default: 0xff800000	Type: parameter Data type: unsigned 32-bit integer

Description: flash memory base address.	
Name: flash.bytesize Default: 8388608	Type: parameter Data type: unsigned 32-bit integer
Description: flash memory size in bytes.	
Name: flash.endian Default: big-endian Valid: little-endian, big-endian	Type: parameter Data type: endianness
Description: endianness of flash memory.	
Name: flash.sector-protect[0] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect[1] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect[2] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect[3] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect[4] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	

Name: flash.sector-protect [5] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [6] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [7] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [8] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [9] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [10] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [11] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [12] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	

Name: flash.sector-protect [13] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [14] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [15] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [16] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [17] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.sector-protect [18] Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable sector write protection.	
Name: flash.fsm-to-graphviz-output- ↔filename Default:	Type: parameter Data type: string
Description: FSM (finite state machine) to Graphviz output filename.	
Name: flash.cycle-time Default: 13332 ps	Type: parameter Data type: sc_time

Description: flash memory cycle time.	
gdb-server	
Name: gdb-server.memory-atom-size Default: 0x00000001	Type: parameter Data type: unsigned 32-bit integer
Description: size of the smallest addressable element in memory.	
Name: gdb-server.tcp-port Default: 0	Type: parameter Data type: signed 32-bit integer
Description: TCP/IP port to listen waiting for a GDB client connection.	
Name: gdb-server.architecture-description ↔filename Default: gdb_powerpc.xml	Type: parameter Data type: string
Description: filename of a XML description of the connected processor.	
Name: gdb-server.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
Description: Enable/Disable verbosity.	
inline-debugger	
Name: inline-debugger.memory-atom-size ↔size Default: 0x00000001	Type: parameter Data type: unsigned 32-bit integer
Description: size of the smallest addressable element in memory.	
Name: inline-debugger.search-path Default:	Type: parameter Data type: string
Description: Search path for source (separated by ';').	
Name: inline-debugger.init-macro Default:	Type: parameter 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.	
Name: inline-debugger.architecture- ↔description-filename	Type: parameter
Default:	Data type: string
Description: filename of a XML description of the connected processor.	
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:0x0-0x00fff,rom:0xff0000-0xffff).	
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 Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable address map A.	
Name: mpc107.memory_32bit_data_bus_↔size Default: true Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable 32-bit data bus width.	
Name: mpc107.rom0_8bit_data_bus_↔size Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable rom #0 8-bit data bus width.	
Name: mpc107.rom1_8bit_data_bus_↔size Default: false Valid: true, false	Type: parameter Data type: boolean
Description: enable/disable rom #1 8-bit data bus width.	
Name: mpc107.frequency Default: 75	Type: parameter Data type: unsigned 32-bit integer
Description: frequency in Mhz.	
Name: mpc107.sdram_cycle_time Default: 13332	Type: parameter Data type: unsigned 64-bit integer
Description: SDRAM cycle time in picoseconds.	
mpc107.DMA	
Name: mpc107.DMA.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
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] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.base-address[2] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.base-address[3] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.base-address[4] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.base-address[5] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.base-address[6] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: base address of mapped device.	
Name: pci-bus.size[0] Default: 1073741824	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: size in bytes of mapped device.	
Name: pci-bus.size[1] Default: 0	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: size in bytes of mapped device.	

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

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

Name: pci-bus.target-port [4] Default: 0	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: target port number.	
Name: pci-bus.target-port [5] Default: 0	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: target port number.	
Name: pci-bus.target-port [6] Default: 0	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: target port number.	
Name: pci-bus.register-number [0] Default: 0x00000010	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.register-number [1] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.register-number [2] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.register-number [3] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.register-number [4] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	

Name: pci-bus.register-number[5] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.register-number[6] Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: mapping: BAR offset in PCI device configuration space.	
Name: pci-bus.addr-type[0] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.addr-type[1] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.addr-type[2] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.addr-type[3] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.addr-type[4] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.addr-type[5] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	

Name: pci-bus.addr-type[6] Default: mem Valid: mem, i/o, cfg	Type: parameter Data type: pci space
Description: mapping: address space type.	
Name: pci-bus.frequency Default: 33	Type: parameter Data type: unsigned 32-bit integer
Description: frequency in Mhz.	
pci-stub	
Name: pci-stub.verbose Default: false Valid: true, false	Type: parameter Data type: boolean
Name: pci-stub.is-server Default: false Valid: true, false	Type: parameter 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]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.initial-base-addr[↔5]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.address-space[0]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.address-space[1]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.address-space[2]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.address-space[3]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.address-space[4]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.address-space[5]	Type: parameter
Default: mem	Data type: pci space
Valid: mem, i/o, cfg	
Name: pci-stub.region-size[0]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.region-size[1]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.region-size[2]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.region-size[3]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.region-size[4]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.region-size[5]	Type: parameter
Default: 0x00000000	Data type: unsigned 32-bit integer
Name: pci-stub.pci-device-number	Type: parameter
Default: 0x00000000	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	Type: parameter Data type: unsigned 32-bit integer
Description: Minimum address for data read profiling.	
Name: profiler.max-data-read-prof- ↔addr Default: 0xffffffff	Type: parameter Data type: unsigned 32-bit integer
Description: Maximum address for data read profiling.	
Name: profiler.min-data-write-prof- ↔addr Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: Minimum address for data write profiling.	
Name: profiler.max-data-write-prof- ↔addr Default: 0xffffffff	Type: parameter Data type: unsigned 32-bit integer
Description: Maximum address for data write profiling.	
Name: profiler.min-insn-fetch-prof- ↔addr Default: 0x00000000	Type: parameter Data type: unsigned 32-bit integer
Description: Minimum address for instruction fetch profiling.	
Name: profiler.max-insn-fetch-prof- ↔addr Default: 0xffffffff	Type: parameter 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	

<p>Description: Enable/Disable verbosity.</p>
--

1.6 Statistics

Simulation statistic counters are listed below:

cpu	
<p>Name: <code>cpu.instruction-counter</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of simulated instructions.</p>	
<p>Name: <code>cpu.bus-cycle</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of simulated bus cycles.</p>	
<p>Name: <code>cpu.num-il1-accesses</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of accesses to L1 instruction cache.</p>	
<p>Name: <code>cpu.num-il1-misses</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of misses to L1 instruction cache.</p>	
<p>Name: <code>cpu.num-dl1-accesses</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of accesses to L1 data cache.</p>	
<p>Name: <code>cpu.num-dl1-misses</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of misses to L1 data cache.</p>	
<p>Name: <code>cpu.num-l2-accesses</code></p>	<p>Type: statistic Data type: unsigned 64-bit integer</p>
<p>Description: number of accesses to unified L2 cache.</p>	

Name: <code>cpu.num-l2-misses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of misses to unified L2 cache.	
Name: <code>cpu.num-ibat-accesses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of accesses to IBATs.	
Name: <code>cpu.num-ibat-misses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of misses to IBATs.	
Name: <code>cpu.num-dbat-accesses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of accesses to DBATs.	
Name: <code>cpu.num-dbat-misses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of misses to DBATs.	
Name: <code>cpu.num-itlb-accesses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of accesses to ITLB.	
Name: <code>cpu.num-itlb-misses</code>	Type: statistic Data type: unsigned 64-bit integer
Description: number of misses to ITLB.	
Name: <code>cpu.num-dtlb-accesses</code>	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.	

1.7 Formulas

Simulation statistic formulas are listed below:

cpu		
Name: cpu.il1-miss-rate Formula: $\text{cpu.num-il1-misses} / \text{cpu.} \leftarrow \text{num-il1-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.dl1-miss-rate Formula: $\text{cpu.num-dl1-misses} / \text{cpu.} \leftarrow \text{num-dl1-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.l2-miss-rate Formula: $\text{cpu.num-l2-misses} / \text{cpu.} \leftarrow \text{num-l2-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.ibat-miss-rate Formula: $\text{cpu.num-ibat-misses} / \text{cpu.} \leftarrow \text{num-ibat-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.dbat-miss-rate Formula: $\text{cpu.num-dbat-misses} / \text{cpu.} \leftarrow \text{num-dbat-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.itlb-miss-rate Formula: $\text{cpu.num-itlb-misses} / \text{cpu.} \leftarrow \text{num-itlb-accesses}$	Type: formula Data type: floating-point	double precision
Name: cpu.dtlb-miss-rate Formula: $\text{cpu.num-dtlb-misses} / \text{cpu.} \leftarrow \text{num-dtlb-accesses}$	Type: formula Data type: floating-point	double precision