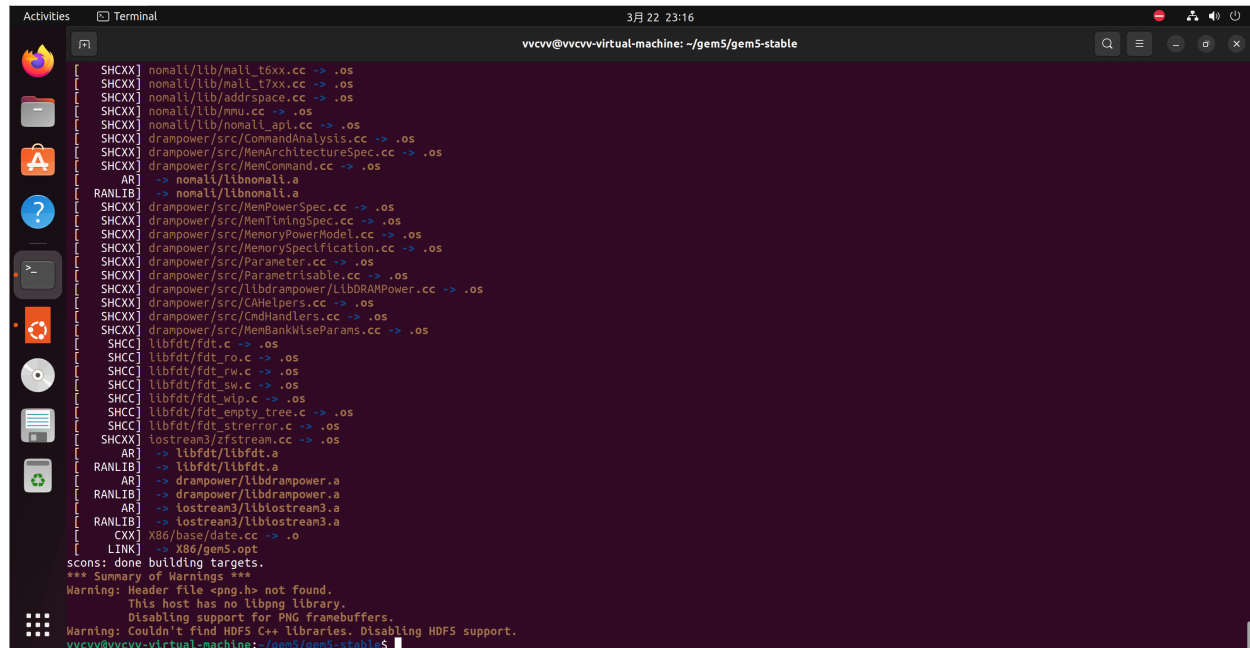


Comparch lab1 report

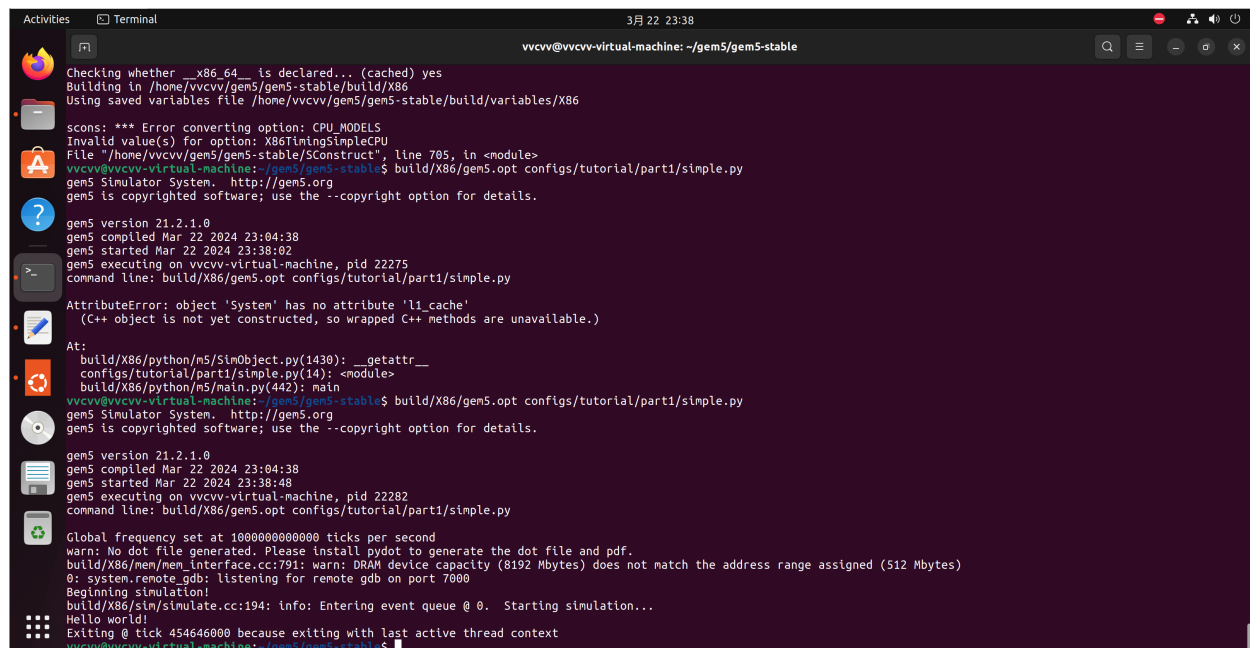
PB21071458 万宸希

成功编译gem5截图



```
SHCXX] nomali/lib/nali_t6xx.cc -> .os
SHCXX] nomali/lib/nali_t7xx.cc -> .os
SHCXX] nomali/lib/addrspace.cc -> .os
SHCXX] nomali/lib/mmu.cc -> .os
SHCXX] nomali/lib/nomali_api.cc -> .os
SHCXX] drampower/src/CommandAnalysis.cc -> .os
SHCXX] drampower/src/MemArchitectureSpec.cc -> .os
SHCXX] drampower/src/MemCommand.cc -> .os
AR] -> nomali/libnomali.a
RANLIB] -> nomali/libnomali.a
SHCXX] drampower/src/MemPowerSpec.cc -> .os
SHCXX] drampower/src/MemTimingSpec.cc -> .os
SHCXX] drampower/src/MemoryPowerModel.cc -> .os
SHCXX] drampower/src/MemorySpecification.cc -> .os
SHCXX] drampower/src/Parameter.cc -> .os
SHCXX] drampower/src/Parametrisable.cc -> .os
SHCXX] drampower/src/Libdrampower/LibDRAMPower.cc -> .os
SHCXX] drampower/src/CHelpers.cc -> .os
SHCXX] drampower/src/CndHandlers.cc -> .os
SHCXX] drampower/src/MemBankWiseParams.cc -> .os
SHCC] libfdt/fdt.c -> .os
SHCC] libfdt/fdt_ro.c -> .os
SHCC] libfdt/fdt_rw.c -> .os
SHCC] libfdt/fdt_sw.c -> .os
SHCC] libfdt/fdt_wip.c -> .os
SHCC] libfdt/fdt_empty_tree.c -> .os
SHCC] libfdt/fdt_strerror.c -> .os
SHCXX] iostream3/zfstream.cc -> .os
AR] -> libfdt/libfdt.a
RANLIB] -> libfdt/libfdt.a
AR] -> drampower/libdrampower.a
RANLIB] -> drampower/libdrampower.a
AR] -> iostream3/libiostream3.a
RANLIB] -> iostream3/libiostream3.a
CXX] X86/base/date.cc -> .o
LINK] -> X86/gen5.opt
scons: done building targets.
*** Summary of Warnings ***
Warning: Header file <png.h> not found.
This host has no libpng library.
Disabling support for PNG framebuffer.
Warning: Couldn't find HDF5 C++ libraries. Disabling HDF5 support.
vvcv@vvcv-virtual-machine: ~/gem5/gem5-stable$
```

运行simple.py结果



```
Checking whether __x86_64__ is declared... (cached) yes
Building in /home/vvcv/gem5/gem5-stable/build/X86
Using saved variables file /home/vvcv/gem5/gem5-stable/build/variables/X86
scons: *** Error converting option: CPU_MODELS
Invalid value(s) for option: X86TimingSimpleCPU
File "/home/vvcv/gem5/gem5-stable/SConstruct", line 785, in <module>
vvcv@vvcv-virtual-machine: ~/gem5/gem5-stable$ build/X86/gen5.opt configs/tutorial/part1/simple.py
gem5 Simulator System. http://gem5.org
gem5 is copyrighted software; use the --copyright option for details.

gem5 version 21.2.1.0
gem5 compiled Mar 22 2024 23:04:38
gem5 started Mar 22 2024 23:38:02
gem5 executing on vvcv-virtual-machine, pid 22275
command line: build/X86/gen5.opt configs/tutorial/part1/simple.py

AttributeError: object 'System' has no attribute 'l1_cache'
(C++ object is not yet constructed, so wrapped C++ methods are unavailable.)

At:
build/X86/python/n5/SimObject.py(1430): _getattr__
configs/tutorial/part1/simple.py(14): <module>
build/X86/python/n5/main.py(442): main
vvcv@vvcv-virtual-machine: ~/gem5/gem5-stable$ build/X86/gen5.opt configs/tutorial/part1/simple.py
gem5 Simulator System. http://gem5.org
gem5 is copyrighted software; use the --copyright option for details.

gem5 version 21.2.1.0
gem5 compiled Mar 22 2024 23:04:38
gem5 started Mar 22 2024 23:38:48
gem5 executing on vvcv-virtual-machine, pid 22282
command line: build/X86/gen5.opt configs/tutorial/part1/simple.py

Global frequency set at 1000000000 ticks per second
warn: No dot file generated. Please install pydot to generate the dot file and pdf.
build/X86/mem/mem_interface.cc:791: warn: DRAM device capacity (8192 Mbytes) does not match the address range assigned (512 Mbytes)
0: system.remote gdb: listening for remote gdb on port 7000
Beginning simulation!
build/X86/sim/simulate.cc:194: Info: Entering event queue @ 0. Starting simulation...
Hello world!
Exiting @ tick 454646000 because exiting with last active thread context
vvcv@vvcv-virtual-machine: ~/gem5/gem5-stable$
```

运行two_level.py结果

```
Activities Terminal 3月23 00:24 vvcvv@vvcvv-virtual-machine: ~/gem5/gem5-stable

--- END LIBC BACKTRACE ---
Aborted (core dumped)
vvcvv@vvcvv-virtual-machine: ~/gem5/gem5-stable$ build/X86/gem5.opt configs/tutorial/part1/two_level.py --help
gem5 Simulator System. http://gem5.org
gem5 is copyrighted software; use the --copyright option for details.

gem5 version 21.2.1.0
gem5 compiled Mar 22 2024 23:04:38
gem5 started Mar 23 2024 00:22:42
gem5 executing on vvcvv-virtual-machine, pid 23580
command line: build/X86/gem5.opt configs/tutorial/part1/two_level.py --help

usage: two_level.py [-h] [--l1i_size L1I_SIZE] [--l1d_size L1D_SIZE] [--l2_size L2_SIZE] [binary]

A simple system with 2-level cache.

positional arguments:
  binary                Path to the binary to execute.

options:
  -h, --help            show this help message and exit
  --l1i_size L1I_SIZE   L1 instruction cache size. Default: 16kB.
  --l1d_size L1D_SIZE   L1 data cache size. Default: 64kB.
  --l2_size L2_SIZE     L2 cache size. Default: 256kB.

vvcvv@vvcvv-virtual-machine: ~/gem5/gem5-stable$ build/X86/gem5.opt configs/tutorial/part1/two_level.py --l2_size=1MB --l1d_size=128kB
gem5 Simulator System. http://gem5.org
gem5 is copyrighted software; use the --copyright option for details.

gem5 version 21.2.1.0
gem5 compiled Mar 22 2024 23:04:38
gem5 started Mar 23 2024 00:24:44
gem5 executing on vvcvv-virtual-machine, pid 23829
command line: build/X86/gem5.opt configs/tutorial/part1/two_level.py --l2_size=1MB --l1d_size=128kB

Global frequency set at 1000000000000 ticks per second
warn: No dot file generated. Please install pydot to generate the dot file and pdf.
build/X86/mem/mem_interface.cc:791: warn: DRAM device capacity (8192 Mbytes) does not match the address range assigned (512 Mbytes)
0: system.remote_gdb: listening for remote gdb on port 7000
Beginning simulation!
build/X86/sim/simulate.cc:194: info: Entering event queue @ 0. Starting simulation...
Hello world!
Exiting @ tick 56435000 because exiting with last active thread context
vvcvv@vvcvv-virtual-machine: ~/gem5/gem5-stable$
```

流程说明

实验大致流程如下：

1. unzip实验主页中的gem5_simple.zip文件并安装相关依赖 `sudo apt install build-essential git m4 scons zlib1g zlib1g-dev libprotobuf-dev protobuf-compiler libprotoc-dev libgoogle-perftools-dev python-dev-is-python3`
2. 编译gem5 `scons build/X86/gem5.opt -j8`
`CPU_MODELS=AtomicSimpleCPU,TimingSimpleCPU,O3CPU,MinorCPU`
3. 阅读gem5 Getting started文档，按要求编写simple.py, caches.py以及two_level.py，原文档里的x86TimingSimpleCPU需替换为TimingSimpleCPU
4. 运行配置文件
5. 阅读后续章节，了解gem5输出的统计文件内容，如何使用gem5自带的配置文件进行模拟