

**gem5 at home (or  
work/school)**



# Getting help

gem5 has lots of resources to get help:

1. Documentation at [gem5 doxygen](#)
2. Ways to reach out for help:
  - [Github discussions](#) **This is the main place for questions**
  - [gem5 Slack channel](#)
  - Join our mailing lists:
    - [gem5-dev@gem5.org](mailto:gem5-dev@gem5.org) : For discussions regarding gem5 development
    - [gem5-users@gem5.org](mailto:gem5-users@gem5.org) : For general discussions about gem5 and its use
    - [gem5-announce@gem5.org](mailto:gem5-announce@gem5.org) : For general gem5 announcements
3. [Youtube videos](#)

These links and more information are also available at <https://www.gem5.org/ask-a-question/>

We do our best to get to questions, but they often go unanswered. This isn't because it's not a good question, but because we don't have enough volunteers.



# Running gem5 at home

- gem5 performance qualities
  - Single threaded
  - Consumes lots of RAM (if you want to model 32 GB of memory, it needs 32 GB of memory to model it)
  - Can take a lot of time
- Because of this its best to run multiple experiments in parallel
- Recommended hardware:
  - High single thread performance
  - Doesn't need many cores
  - LOTS OF RAM



# System software requirements

- Ubuntu 22.04+ (at least GCC 10)
  - 20.04 works, but there are bugs in GCC 8 (or 9, whatever the default is) and you have to upgrade the GCC version.
- Python 3.6+
- SCons
- Many optional requirements.

This *should* work on most Linux systems and on MacOS.

See our Dockerfiles for the most up-to-date version information:

[gem5/util/dockerfiles/](https://github.com/gem5/util/dockerfiles/)



# Using dockerfiles

If you have trouble, we have docker images.

Here's a generic docker command that should work.

```
docker run --rm -v $(pwd):$(pwd) -w $(pwd) ghcr.io/gem5/ubuntu-24.04_all-dependencies:v24-0 <your command>
```

- Runs the image at `https://ghcr.io/gem5/ubuntu-24.04_all-dependencies:v24-0`.
- Automatically removes the docker image (`--rm`)
- Sets it up so that the current directory (`-v $(pwd):$(pwd)`) is available inside the docker container
- Sets the working directory to the current directory (`-w $(pwd)`)
- Runs a command.
- Every command will now need to run with this to make sure the libraries are set up correctly.

I cannot **strongly enough** emphasize that you should not run interactively in the docker container. Use it to just run one command at a time.



# The devcontainer

The devcontainer we've been using is based off of `ghcr.io/gem5/ubuntu-24.04_all-dependencies:v24-0`, but also includes some gem5 binaries.

You can find it at `ghcr.io/gem5/devcontainer:bootcamp-2024`.

The source is at `gem5/utils/dockerfiles/devcontainer`.



# Recommended practices

- Unless planning on contributing to gem5 or you need to use recently developed work, use the `stable` branch.
- Create branches off of stable.
- Don't modify parameters of python files in `src/`. Instead create *extensions* of stdlib types or SimObjects.
- Don't be afraid to read the code. The code is the best documentation.



# gem5 Cheat Sheet

## Downloading

```
git clone https://github.com/gem5/gem5
```

## Building

```
scons build/ALL/gem5.opt -j$(nproc)
```

## Customizing the build

```
scons menuconfig build/ALL
```

## Running

```
build/ALL/gem5.opt <your script>
```

## Example scripts

```
configs/examples/gem5_library
```

## Debugging

```
build/ALL/gem5.opt --debug-flags=<debug flags> <your script>  
build/ALL/gem5.opt --debug-help
```



# More cheat sheet

## Creating a disk image

See <https://github.com/gem5/gem5-resources/>.  
Use the packer files already available or create your own.

```
packer build <packer json file>
```

## Take a checkpoint

```
sim.save_checkpoint('checkpoint')
```

## Restore a checkpoint

```
sim = Simulator(checkpoint_path='checkpoint')
```

# Final things

# Big thanks

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Saili Karkare



Matt Sinclair



# Big thanks to you all!

 Group photo

Please let us know how we did:

<https://forms.gle/M6HZHxGjXpcdw4kZ8>