Using WCSim on anniegpvm

This is by no means a complete tutorial. This is simply what has worked for me (as of July 2025), based on Marcus' instructions from the hackathon (https://annie-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=5048). This will also be (for the most part) a repeat of that tutorial.

Note before we start: Ensure you are building WCSim in /exp /annie/app, and not in /pnfs

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The steps to run WCSim on the gpvms are as follows:

1. Create and enter a working directory within your user area on /exp/annie/app.

2. Start up a container from the WCSim image, with the correct folders bind mounted:
   - $. **singularity shell -B/pnfs:/pnfs,/cvmfs:/cvmfs,/exp/annie/data:/exp/annie/data,/exp/annie/app:/exp/annie/app /cvmfs/singularity.opensciencegrid.org/anniesoft/wcsim\:latest/**

3. Configure the container environment by sourcing the appropriate setup script:
   - $. **source /home/annie/setup**

4. Next, either copy WCSim to your local area (this folder will be called <copied_WCSim>):
   - $. **cp -r /home/annie/WCSim/WCSim .**

   Or you can compile from git:
   - $. **git clone -b <branch_name> <web_url_clone_link> .**
     (for example: git clone -b Individual_PMT_tilting https://github.com/S81D/WCSim.git .)
     (you can drop the -b if cloning from the default branch of a repo)

5. Since we are not using an overlay, we need to make a build directory (will be called <build_folder>) in a writable (bind-mounted) location. Enter that directory and make the executable:
   - $. **mkdir <build_folder>**
   - $. **cd <build_folder>/**
   - $. **cmake ../<copied_WCSim >**
   - $. **make**

6. WCSim should now be built and have an executable **WCSim**.

To run WCSim, navigate to your build directory, enter the container, source the setup script, and run:
./WCSim WCSim.mac

IMPORTANT NOTE

(modified) Step 5 for building from git:

- If you compile from git, for some reason there is a missing `WCSimRootDict_rdict.pcm` file that causes a **cmake** error when running the third step above (**cmake ../<copied_WCSim>**). I'm not sure why this is the case, but that file does not exist outside of the WCSim container so we cannot simply copy it into a repository and prevent this error. The error you should receive looks like this:

  CMake Error: File /exp/annie/app/users/doran/WCSim_individual_tilting/WCSim/WCSimRootDict_rdict.pcm does not exist.
  CMake Error at CMakeLists.txt:247 (configure_file):
  configure_file Problem configuring file

  -- Configuring incomplete, errors occurred!

  We have to copy the file within the singularity container before cmaking. To build successfully:
- $. **mkdir <build_folder>**
- $. **cd <build_folder>/**
- $. **cp /home/annie/WCSim/WCSim/WCSimRootDict_rdict.pcm ../<copied_WCSim/.**
- $. **cmake ../<copied_WCSim >**
- $. **make**

  You should now have a built WCSim directory + executable.

To make modifications to WCSim (for example, edit files in /src):

After modifications to the copied WCSim directory files, you can rebuild WCSim by entering the container, sourcing the setup script, then:
- $. **mkdir <new_build_folder>**
- $. **cd <new_build_folder>**
- $. **cmake ../<copied_WCSim >**
- $. **make**

This will rebuild WCSim with your changes.