

Tool Building Instruction

Reference: <http://clang.llvm.org/docs/LibASTMatchersTutorial.html>

Installation: Obtaining Clang

As Clang is part of the LLVM project, you'll need to download LLVM's source code first. Both Clang and LLVM are maintained as Subversion repositories, but we'll be accessing them through the git mirror. For further information, see the [getting started guide](#).

```
mkdir ~/clang-llvm && cd ~/clang-llvm
git clone http://llvm.org/git/llvm.git
cd llvm/tools git clone http://llvm.org/git/clang.git
cd clang/tools
git clone http://llvm.org/git/clang-tools-extra.git extra
```

Next you need to obtain the CMake build system and Ninja build tool. You may already have CMake installed, but current binary versions of CMake aren't built with Ninja support.

```
cd ~/clang-llvm
git clone https://github.com/martine/ninja.git
cd ninja git checkout release
./bootstrap.py
sudo cp ninja /usr/bin/
cd ~/clang-llvm
git clone git://cmake.org/stage/cmake.git
cd cmake git checkout next
./bootstrap
make
sudo make install
```

Okay. Now we'll build Clang!

```
cd ~/clang-llvm
mkdir build && cd build
cmake -G Ninja ../llvm -DLLVM_BUILD_TESTS=ON # Enable tests; default
is off.
ninja
ninja check      # Test LLVM only.
ninja clang-test # Test Clang only.
ninja install
```

Finally, we want to set Clang as its own compiler.

```
cd ~/clang-llvm/build
ccmake ../llvm
```

The second command will bring up a GUI for configuring Clang. You need to set the entry for CMAKE_CXX_COMPILER.

Press 't' to turn on advanced mode. Scroll down to CMAKE_CXX_COMPILER, and set it to /usr/bin/clang++, or wherever you installed it. Press 'c' to configure, then 'g' to generate CMake's files.

Finally, run ninja one last time, and you're done.

ninja

Create ClangTool

1. Create directory for the tool

```
cd ~/clang-llvm/llvm/tools/clang
mkdir tools/extra/h2m
```

2. Tell cmake it exists (in the tools/extra directory)

```
echo 'add_subdirectory(h2m)' >> tools/extra/CMakeLists.txt
```

3. Configure cmakelists.txt in the tools/extra/h2m directory

```
vim tools/extra/h2m/CMakeLists.txt
```

```
set(LLVM_LINK_COMPONENTS support)
add_clang_executable(h2m
  H2m.cpp
)
target_link_libraries(h2m
  clangTooling
  clangBasic
  clangASTMatchers
  clangFrontend
)
```

4. Add the tool files to the directory:

```
tools/extra/h2m/h2m.h
tools/extra/h2m/h2m.cpp
```

5. Compile the tool

```
cd ~/clang-llvm/build
ninja
```

6. Test the tool

```
~/clang-llvm/build/bin/h2m /usr/include/pthread.h --
```

Note the two dashes after we specify the source file. The additional options for the compiler are passed after the dashes rather than loading them from a compilation database - there just aren't any options needed right now.