**Emscripten from Source**

Building Emscripten yourself is an alternative to getting binaries using the emsdk.

Emscripten itself is written in Python and JavaScript so it does not need to be compiled. However, after checkout you will need to perform various steps before it can be used (e.g. npm install). The bootstrap script in the top level of the repository takes care of running these steps and emcc will error out if it detects that bootstrap needs to be run.

Emscripten comes with its own versions some C/C++ system libaries which emcc builds automatically as and when needed (in the emsdk builds, these are precompiled). You can also build them manually with the embuilder tool - see embuilder --help for more information.

In addition to the main emscripten repository you will also need to checkout and build LLVM and Binaryen (as detailed below). After compiling these, you will need to edit your .emscripten file to point to their corresponding locations.

Use the main branches of each of these repositories, or check the [Packaging](https://github.com/emscripten-core/emscripten/blob/main/docs/packaging.md) instructions to identify precise commits used in a specific release.

**Building LLVM**

Build LLVM from the [git repo](https://github.com/llvm/llvm-project). Include clang and wasm-ld (using something like -DLLVM\_ENABLE\_PROJECTS='lld;clang') and the Wasm backend (which is included by default; just don’t disable it), following [that project’s instructions](http://llvm.org/docs/CMake.html). For example, something like this can work:

mkdir build

cd build**/**

cmake **../**llvm **-**DCMAKE\_BUILD\_TYPE**=**Release **-**DLLVM\_ENABLE\_PROJECTS**=**'lld;clang' **-**DLLVM\_TARGETS\_TO\_BUILD**=**"host;WebAssembly" **-**DLLVM\_INCLUDE\_EXAMPLES**=**OFF **-**DLLVM\_INCLUDE\_TESTS**=**OFF *# -DLLVM\_ENABLE\_ASSERTIONS=ON*

cmake **--**build **.**

Then set the environment variable EM\_LLVM\_ROOT to <llvm\_src>/build/bin (no need to install).

If you need to match the emsdk releases of LLVM, [review the emscripten-release build and test scripts](https://chromium.googlesource.com/emscripten-releases/+/refs/heads/main#build-and-test-scripts-in). Specifically [src/build.py](https://chromium.googlesource.com/emscripten-releases/+/refs/heads/main/src/build.py).

Please refer to the upstream docs for more detail.

**Building Binaryen**

See the [Binaryen build instructions](https://github.com/WebAssembly/binaryen" \l "building).

* [Emscripten Toolchain Requirements](https://emscripten.org/docs/building_from_source/toolchain_what_is_needed.html)
* [Configuring Emscripten Settings when Manually Building from Source](https://emscripten.org/docs/building_from_source/configuring_emscripten_settings.html)
* [Verifying the Emscripten Development Environment](https://emscripten.org/docs/building_from_source/verify_emscripten_environment.html)