

LLVM Backend for SD-8516

February to April 2026

I started by copying the Lanai files and renaming everything to SD8516. When it compiled I moved forward.

Yes, this took three months.

April and May 2026

During this time I worked on the back-end. There are many tutorials on the 'net such as the CPU0 tutorial. I chose LLVM because I heard the documentation was more useful. Thank God, because I was going to need everything I could get. It's impossible to describe this process. I should have kept more notes on the wiki about it. I may have been able to save myself several days worth of grepping to find random stuff in the target's source tree. This period I call the insanity days. 4 and 8 hour days of doing nothing but trying to lower LLVM code into SDA assembly.

This period is binary. It compiles or it does not. There is no incremental improvement here. I learned a lot and actually changed my ISA a bit because of what I learned doing this. But, I do not remember anything I did here. It is a black hole. I've probably blocked it out of my memory. It was that horrifying.

June 2026

A sudden thrust of energy, cola and Doritos and the back-end was in sight. A lot of this was fueled by excitement over many small wins. Such as getting something to work. Once I saw it start to emit SDA assembly I was hooked. Many small changes to the assembler were made too, to support LLVM stuff that I didn't want to try and lower out.

Notes from June

- That stupid string that looks like e-p:32:8-i16:8-i32:8-i64:8-n16 is in:
 - `llvm/lib/TargetParser/TargetDataLayout.cpp`
- COMMON files I need to find:
 - `llvm/lib/Target/SD8516/SD8516InstrFormats.`
 - `llvm/lib/Target/SD8516/SD8516InstrInfo.`
 - `llvm/lib/Target/SD8516/SD8516ISelLowering.`

Common advice:

- Look very carefully at the error message. 90% of the time you're missing a header, a function declaration, or something's type is wrong. The solution is often easier than you think.

- Use git or you will mess stuff up and be unable to go back.

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