

BASIC FASM

FASM introduction

Objectives

- You will learn generally about different x86 assemblers.
- You will be introduced to the FASM assembler.
 - fasm's general features.
 - How to install fasm?

The assembler

- The processor can only understand numbers as instructions.
- Human beings are not very good at remembering numbers.
- Every opcode was given an mnemonic, so that it would be easier to remember.

- Example:

Encoding	Instruction
B8 03 00 00 00	mov eax, 3
BA 00 00 00 00	mov edx, 0
B9 00 00 00 00	mov ecx, 0
F7 F1	div ecx

- The assembler translates text based instructions into numeric encoding.
 - It does some other important things. We will talk about those later.

Common x86 assemblers

- Masm (Microsoft Macro Assembler)
 - By Microsoft (Since 1981).
 - These days arrives with Microsoft SDK or C compilers, not as a standalone product.
 - Free, but legally can only be used to develop programs for the Windows operation system.
- Nasm (Netwide assembler)
 - Originally by Simon Tatham and Julian Hall (Since 1996).
 - Free (2-clause BSD License) and open source.
 - Cross platform.
- Gas (Gnu Assembler)
 - By the GNU project.
 - Free and open source.
 - Cross platform.
- Many more: yasm, tasm, goasm,...

FASM

- The Flat Assembler (FASM)
- By Tomasz Grysztar. Released in 2000.
- Free and open source.
- Cross platform (Windows/DOS, Linux/Unix like)
- Written in assembly language (Current releases are written in FASM).
- Allows to build source into an executable without a linking stage.

Why FASM

- Has a very simple syntax (Intel style).
 - Pretty similar to NASM.
- Easy to begin with.
 - Source could be built directly into executable. (No need for external linker)
- Free and open source. No restricting license.
- Supportive community forums.
- If you know x86 well, specific choice of assembler is merely a matter of taste.
 - We will not discuss very specific features of fasm. We will mostly use it to learn x86 assembly.
 - You may choose a different assembler and work with it through the course, if you want to.

Getting FASM

- Go to <http://flatassembler.net>
- Click the download section.
- Download flat assembler for windows.
 - I highly recommend that you do this course inside the windows operation system.
- Extract the compressed file to some folder.
- Paths:
 - Add the fasm directory to the PATH environment variable.
 - Add the INCLUDE environment variable name to be the INCLUDE folder inside the fasm package.