

Use The Source

But what is it?

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December 9, 2009

“Use the Force, Luke!”

“Use the Force, Luke!”

But what is it, anyway?

“Use the Source!”

But what is it, anyway?

The Question

What is “Source Code”?

The Importance of Source

Definitions

The program must include *source code*, and must allow distribution in source code as well as compiled form. ... The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed. — *Open Source Definition*

The Importance of Source

Licenses

The “*source code*” for a work means the preferred form of the work for making modifications to it. “Object code” means any non-source form of a work. — *GNU GPLv3*

1. Redistributions of *source code* must retain the above copyright notice, this list of conditions and the following disclaimer. — *FreeBSD License*

What Is Source?

How Does a Computer Run?

A traditional computer *executes* a program which is stored as a sequence of *numbers*.

4c8d 0424 e483 fff0

What Is Source?

Raw Material

The numbers encode *machine instructions*.

main:

```
leal 4(%esp), %ecx  
andl $-16, %esp  
pushl -4(%ecx)
```

What Is Source?

Expressing Ideas

An idea for a program can be expressed in many different languages. Which expression is used depends on the kind of problem being solved, the preferences of the programmer, and fashion.

What is Source?

C

```
int main(int argc, char **argv) { return argv[1][1]; }
```

Ruby

```
array.each { |item| puts item }
```

FORTRAN

```
601 FORMAT (4H A= ,I5,5H B= ,I5,5H C=)
```

LISP

```
((lambda (arg) (+ arg 1)) 5)
```

What is Source?

Preferred Form of Expression

You can express an idea in a single language in different ways.

What is Source?

English

```
int addToBalance(Account *a, int amount)
```

Dutch

```
int bijtellenSaldo(Rekening *a, int hoeveelheid)
```

Obfuscated

```
int DSKFHSDf(Asuhr3 *a, int oriet)
```

What is Source?

Expression and the Computer

The computer doesn't care about the expression of the idea. Most of the expressiveness and *meaning* of the idea is removed in converting to machine code. The “human touch” is ignored by the machine.

What is Source?

Expression and People

For the computer, the means of expression does not matter. For people, it does. In order to effectively understand or appreciate a program you must understand the language. The story the program tells must be a clear story as well.

Literate programming is one extreme example.

Source and Licenses

Choice

A programmer has made a choice of expression for a program. That expression is licensed for use. One thing you can do is *compile* it to a machine program. You can also *modify* or *distribute* the source.

Source and Licenses

Translation

If you translate the parts of the program with *meaning*, that is clearly a derivative work. It's also possible that the derivative is not a form that the original author can work with.

Source and Licenses

Machine Translation

If you translate the program and *remove meaning*, that is a derivative work as well. Obfuscation and compilation are two mechanisms for doing this. Both retain the functionality but remove meaning and change the expression.

Source Distribution

BSD License

1. Redistributions of *source code* must retain the above copyright notice, this list of conditions and the following disclaimer.

Translations

Any and all transformations are allowed.

Source Distribution

GPLv2

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above ...

Translations

Any and all transformations are allowed (!).

Source Distribution

GPLv3

2. The “source code” for a work means the preferred form of the work for making modifications to it. “Object code” means any non-source form of a work.

5. You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4 ...

Translations

Transformations that preserve the “preferred form” are allowed.

Binary Distribution

GPLv2 and GPLv3

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above ...

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable.

Translations

Transformations that preserve the “preferred form” are allowed.

Preferred Form

Whose Preference

The preference lies with the *developers*. The original developer made a choice about what is preferred (e.g. language, programming language, style, conventions). If you make modifications, you do not need to abide by those choices, *but* if you release source code for GPLv3 source releases or GPLv2 or GPLv3 binary releases then that source must still be *some* preferred form (e.g. for the current developers).

Preferred Form

Source Code is what
developers see
when they work on the software.

Additional Tools

Corner Cases

Specialized language requiring a special compiler; unusual compilation process; preprocessing; workarounds.

Preferred Form

Release the compiler, scripts, preprocessor and documentation of workarounds as part of the source code.

Additional Tools

Non-Textual Preferred Forms



Textual Representation

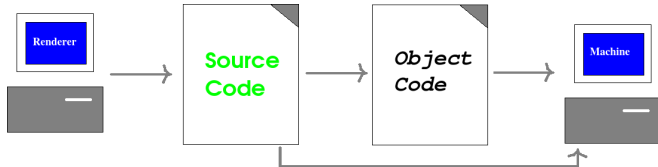
```
<svg width="100%" height="100%" version="1.1"
xmlns="http://www.w3.org/2000/svg"> <rect x="20" y="20"
rx="20" ry="20" width="250" height="100" style="fill:red;
stroke:black; stroke-width:5; opacity:0.5"/> </svg>
```

Additional Tools

Preferred Form

The tools used to create and modify the representation of the program must be available and the “source” should be expressed in a language documented as an open standard.

Additional Tools



What is Source Code?

Source Code is
an expression of a solution
together with tools
for processing that expression
so that someone skilled in the art
can effectively use it
to create an executable program.

Permission is granted ...

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... and to ask questions?