

Free Software

Definition, Importance and Security

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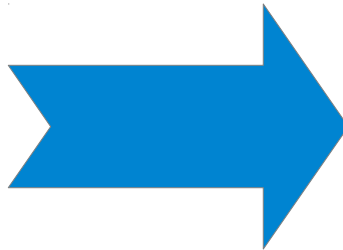
What is software?

How does it work?

```
public String getContentType() {
    return contentType;
}

/**
 * Buffers request body input stream.
 */
private void bufferContent() {

    if (this.buffer != null) {
        // Already been buffered
        return;
    }
    if (this.content != null) {
        try {
            ByteArrayOutputStream tmp = new ByteArrayOutputStream();
            byte[] data = new byte[4096];
            int l = 0;
            while ((l = this.content.read(data)) >= 0) {
                tmp.write(data, 0, l);
            }
            this.buffer = tmp.toByteArray();
            this.content = null;
            this.contentLength = buffer.length;
        } catch (IOException e) {
            LOG.error(e.getMessage(), e);
            this.buffer = null;
            this.content = null;
            this.contentLength = 0;
        }
    }
}
```



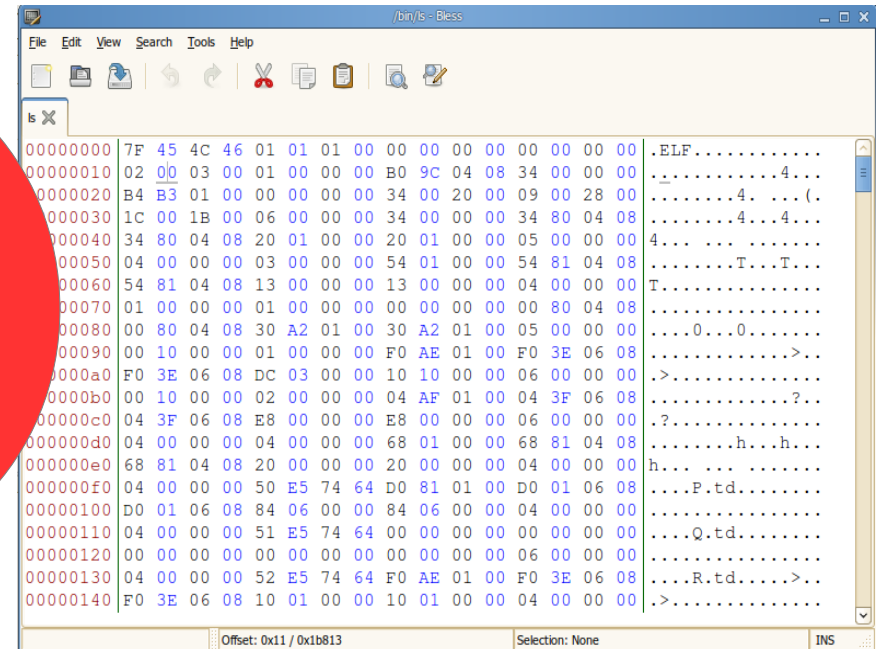
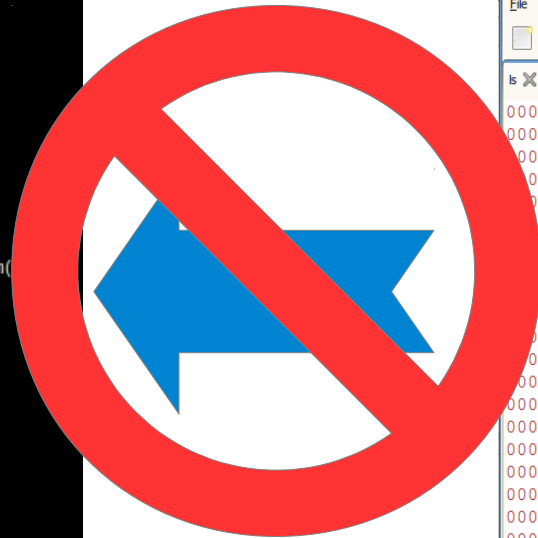
```
00000000 7F 45 4C 46 01 01 01 00 00 00 00 00 00 00 00 00 .ELF.....
00000010 02 00 03 00 01 00 00 00 B0 9C 04 08 34 00 00 00 _.....4...
00000020 B4 B3 01 00 00 00 00 00 34 00 20 00 09 00 28 00 .....4...(.
00000030 1C 00 1B 00 06 00 00 00 34 00 00 00 34 80 04 08 .....4...4...
00000040 34 80 04 08 20 01 00 00 20 01 00 00 05 00 00 00 4...
00000050 04 00 00 00 03 00 00 00 54 01 00 00 54 81 04 08 .....T...T...
00000060 54 81 04 08 13 00 00 00 13 00 00 00 04 00 00 00 T.....
00000070 01 00 00 00 01 00 00 00 00 00 00 00 00 80 04 08 .....
00000080 00 80 04 08 30 A2 01 00 30 A2 01 00 05 00 00 00 ....0...0.....
00000090 00 10 00 00 01 00 00 00 F0 AE 01 00 F0 3E 06 08 .....>...
000000a0 F0 3E 06 08 DC 03 00 00 10 10 00 00 06 00 00 00 .>.....
000000b0 00 10 00 00 02 00 00 00 04 AF 01 00 04 3F 06 08 .....?..
000000c0 04 3F 06 08 E8 00 00 00 E8 00 00 00 06 00 00 00 .?.....
000000d0 04 00 00 00 04 00 00 00 68 01 00 00 68 81 04 08 .....h...h...
000000e0 68 81 04 08 20 00 00 00 20 00 00 00 04 00 00 00 h.....
000000f0 04 00 00 00 50 E5 74 64 D0 81 01 00 D0 01 06 08 ....P.td.....
00000100 D0 01 06 08 84 06 00 00 84 06 00 00 04 00 00 00 .....
00000110 04 00 00 00 51 E5 74 64 00 00 00 00 00 00 00 00 ....Q.td.....
00000120 00 00 00 00 00 00 00 00 00 00 00 00 06 00 00 00 .....
00000130 04 00 00 00 52 E5 74 64 F0 AE 01 00 F0 3E 06 08 .....R.td....>...
00000140 F0 3E 06 08 10 01 00 00 10 01 00 00 04 00 00 00 .>.....
```

Source code → Compiled code

```
public String getContentType() {
    return contentType;
}

/**
 * Buffers request body input stream.
 */
private void bufferContent() {

    if (this.buffer != null) {
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    }
    if (this.content != null) {
        try {
            ByteArrayOutputStream tmp = new ByteArrayOutputStream(
                4096);
            byte[] data = new byte[4096];
            int l = 0;
            while ((l = this.content.read(data)) >= 0) {
                tmp.write(data, 0, l);
            }
            this.buffer = tmp.toByteArray();
            this.content = null;
            this.contentLength = buffer.length;
        } catch (IOException e) {
            LOG.error(e.getMessage(), e);
            this.buffer = null;
            this.content = null;
            this.contentLength = 0;
        }
    }
}
```



Compiling process is not reversible.

What is free software?

Free as it is in “freedom”.

License issue.

Community powered.

A little bit of history...

In 1976 copyright laws in the USA begin to restrict software users.

In 1983 Richard M. Stallman starts the GNU OS project which aims the software to be “free” and belongs to the public.

GPL (General Public License) written by Richard Stallman for the GNU project to protect the freedom of free software.

Formal Definition of Free Software

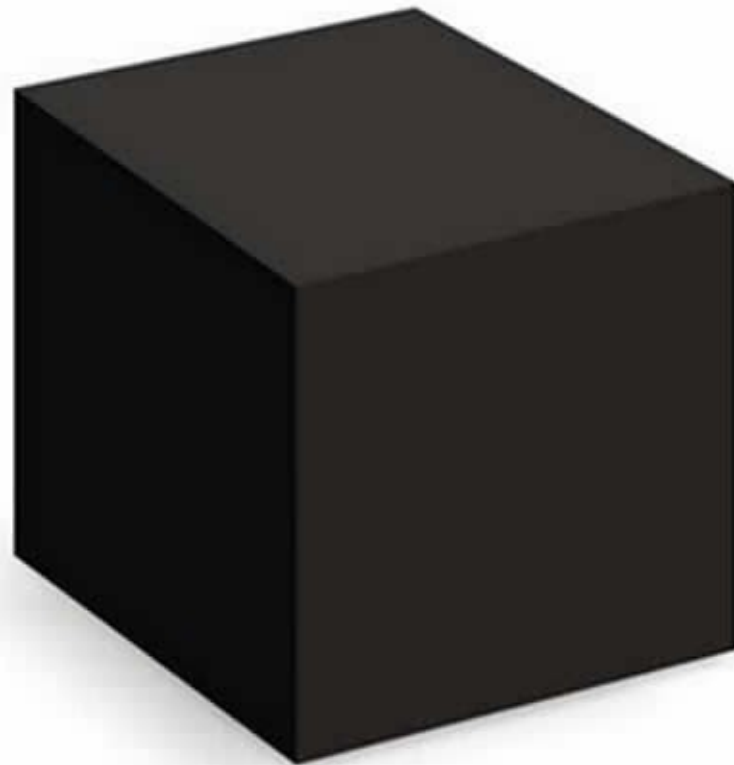
Freedom 0: The freedom to **run** the program for any purpose.

Freedom 1: The freedom to **study** how the program works, and change it to make it do what you wish.

Freedom 2: The freedom to **redistribute** copies so you can help your neighbor.

Freedom 3: The freedom to **improve** the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits.

Black Box



Open source?

Freeware?

Linux?

Examples of free software



Operating systems,
Web browsers,
Office applications,
E-mail clients,
Image processing and graphics,
etc.



Security and Privacy Issues

Everyone have the chance to see what actually a software does. Transparency.

Releasing the source code does not make the software more vulnerable. It gives the chance to users change the code and make it more secure. Reverse engineering exists.

Security and Privacy Issues

More people checking the source code and testing the software is always better than a few people doing it.

When there is a known vulnerability in the software, it is more faster to fix it in a free software.

An Interesting Example:

Some researchers demonstrate that attackers can learn about a vulnerability in a closed source program (Windows) from patches made to an OSS/FS program (Linux). In this example, Linux developers fixed a vulnerability before attackers tried to attack it, and attackers correctly surmised that a similar problem might be still be in Windows (and it was).

Security and Privacy Issues

If less secure systems are more profitable, companies wouldn't work hard to produce more secure systems.

Being open source is no guarantee of security but there is a higher chance of being secure.

References & More Information

- www.gnu.org
- www.osalt.com
- <http://wikipedia.org>
- <http://distrowatch.com>
- <http://www.linux.org.tr/>
- <http://www.gnu.org/>
- <http://www.fsf.org/>
- <http://creativecommons.org/>
- <http://www.osalt.com/>
- <http://www.theopendisc.com/>
- <http://www.dwheeler.com/secure-class/Secure-Programs-HOWTO/open-source-security.html>
- http://directory.fsf.org/wiki/Main_Page
 - www.kali.org
 - www.owasp.org
 - <https://duckduckgo.com/>