

Introduction to open source software

What is open source software?

Open source software is software whose source code is available for modification or enhancement by anyone.

"Source code" is the part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software—a "program" or "application"—works.

Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.

What's the difference between open source software and other types of software?

Some software has source code that cannot be modified by anyone but the person, team, or organization who created it and maintains exclusive control over it. This kind of software is frequently called "proprietary software" or "closed source" software, because its source code is the property of its original authors, who are the only ones legally allowed to copy or modify it.

Microsoft Word and Adobe Photoshop are examples of proprietary software.

In order to use proprietary software, computer users must agree (usually by signing a license displayed the first time they run this software) that they will not do anything with the software that the software's authors have not expressly permitted.

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Open source software is different.

Its authors make its source code available to others who would like to view that code, copy it, learn from it, alter it, or share it.

LibreOffice and the GNU Image Manipulation Program are examples of open source software.

As they do with proprietary software, users must accept the terms of a license when they use open source software.

but the legal terms of open source licenses differ dramatically from those of proprietary licenses.

Open source software licenses promote collaboration and sharing because they allow other people to make modifications to source code and incorporate those changes into their own projects.

Some open source licenses ensure that anyone who alters and then shares a program with others must also share that program's source code without charging a licensing fee for it.

In other words, computer programmers can access, view, and modify open source software whenever they like—as long as they let others do the same when they share their work. In fact, they could be violating the terms of some open source licenses if they *don't* do this.

So as the Open Source Initiative explains, "open source doesn't just mean access to the source code.

" It means that anyone should be able to *modify* the source code to suit his or her needs, and that no one should prevent others from doing the same.

The Initiative's definition of "open source" contains several other important provisions.

Is open source software only important to computer programmers?

Open source software benefits programmers and non-programmers alike.

In fact, because much of the Internet itself is built on many open source technologies—like the Linux operating system and the Apache Web server application—anyone using the Internet benefits from open source software. Every time computer users view webpages, check email, chat with friends, stream music online, or play multiplayer video games, their computers, mobile phones, or gaming consoles connect to a global network of computers that routes and transmits their data to the "local" devices they have in front of them.

The computers that do all this important work are typically located in faraway places that users don't see or can't physically access—which is why some people call these computers "remote computers." More and more, people rely on remote computers when doing things they might otherwise do on their local devices. For example, they use online word processing, email management, and image editing software that they don't install and run on their personal computers. Instead, they simply access these programs on remote computers by using a Web browser or mobile phone application.

Some people call remote computing "cloud computing," because it involves activities (like storing files, sharing photos, or watching videos) that incorporate not only local devices, but also the global network of remote computers that form an "atmosphere" around them. Cloud computing is an increasingly important aspect of everyday life with Internet-connected devices. Some cloud computing applications, like Google Docs, are closed source programs. Others, like Etherpad, are open source programs.

Cloud computing applications run "on top" of additional software that helps them operate smoothly and effectively.

The software that runs "underneath" cloud computing applications acts as a *platform* for those applications. Cloud computing platforms can be open source or closed source. OpenStack is an example of an open source cloud computing platform.

OpenStack is a set of software tools for building and managing cloud computing platforms for public and private clouds. Backed by some of the biggest companies in software development and hosting, as well as thousands of individual community members, many think that OpenStack is the future of cloud computing. OpenStack is managed by the OpenStack Foundation, a non-profit which oversees both development and community-building around the project.

OpenStack lets users deploy virtual machines and other instances which handle different tasks for managing a cloud environment on the fly. It makes horizontal scaling easy, which means that tasks which benefit from running concurrently can easily serve more or less users on the fly by just spinning up more instances. For example, a mobile application which needs to communicate with a remote server might be able to divide the work of communicating with each user across many different instances, all communicating with one another but scaling quickly and easily as the application gains more users.

And most importantly, OpenStack is open source software, which means that anyone who chooses to can access the source code, make any changes or modifications they need, and freely share these changes back out to the community at large. It also means that OpenStack has the benefit of thousands of developers all over the world working in tandem to develop the strongest, most robust, and most secure product that they can.

Why do people prefer using open source software?

Many people prefer open source software because they have more control over that kind of software. They can examine the code to make sure it's not doing anything they don't want it to do, and they can change parts of it they don't like.

Users who aren't programmers also benefit from open source software, because they can use this software for any purpose they wish—not merely the way someone else thinks they should.

Others like open source software because it helps them become better programmers. Because open source code is publicly accessible, students can learn to make better software by studying what others have written. They can also share their work with others, inviting comment and critique.

Some people prefer open source software because they consider it more secure and stable than proprietary software. Because anyone can view and modify open source software, someone might spot and correct errors or omissions that a program's original authors might have missed. And because so many programmers can work on a piece of open source software without asking for permission from original authors, open source software is generally fixed, updated, and upgraded quickly.

Many users prefer open source software to proprietary software for important, long-term projects. Because the source code for open source software is distributed publicly, users that rely on software for critical tasks can be sure their tools won't disappear or fall into disrepair if their original creators stop working on them

Doesn't "open source" just mean something is free of charge?

No. This is a common misconception about what "open source" implies. Programmers can charge money for the open source software they create or to which they contribute.

But because most open source licenses require them to release their source code when they sell software to others, many open source software programmers find that charging users money for *software services and support* (rather than for the software itself) is more lucrative. This way, their software remains free of charge and they make money helping others install, use, and troubleshoot it.

What is open source "beyond software"?

At opensource.com, we like to say that we're interested in the ways open source can be applied to the world *beyond software*. We like to think of open source as not only a way to develop and license computer software, but also an *attitude*. Approaching all aspects of life "the open source way" means expressing a willingness to share, collaborating with others in ways that are transparent (so that others can watch and join too), embracing failure as a means of improving, and expecting—even encouraging—everyone else to do the same.

It means committing to playing an active role in improving the world, which is possible only when everyone has access to the way that world is designed. The world is full of "source code"—blueprints, recipes, rules—that guide and shape the way we think and act in it. We believe this underlying code

(whatever its form) should be open, accessible, and shared—so many people can have a hand in altering it for the better.

Here, we tell stories about what happens when open source values are applied to business, education, government, health, law, and any other area of life.

We're a community committed to telling others how the open source way is the *best* way—because a love of open source is just like anything else: it's better when it's shared.

Examples of some popular open-source software products are :

- Mozilla Firefox: **x** (known simply as **Firefox**) is a free and open-source web browser developed for Windows, OS X, and Linux, with a mobile version for Android, by the Mozilla Foundation and its subsidiary, the Mozilla Corporation. Firefox uses the Gecko layout engine to render web pages, which implements current and anticipated web standards.
- Google Chromium : **Chromium** is the open-source web browser project from which Google Chrome draws its source code. The browsers share the majority of code and features, though there are some minor differences in features and they have different licensing.

The Chromium Project takes its name from the element chromium, the metal from which chrome plating is made. Google's intention, as expressed in the developer documentation, was that Chromium would be the name of the open-source project and that the final product name would be Chrome; however other developers have taken the Chromium code and released versions under the Chromium name. These are listed under community packages.

One of the major aims of the project is for Chrome to be a tabbed window manager, or shell for the web, as opposed to it being a traditional browser application. The application is designed to have a minimalist user interface.

The developers state that it "should feel lightweight (cognitively and physically) and fast".

- **Android:** The **Linux kernel** is a Unix-like computer operating system kernel. The Linux kernel is a widely used operating system kernel world-wide; the Linux operating system is based on it and deployed on both traditional computer systems, usually in the form of Linux distributions, and on embedded devices such as routers. The Android operating system for tablet computers and smartphones is also based atop the Linux kernel.
- **LibreOffice :** **LibreOffice** is a free and open source office suite, developed by The Document Foundation. It was forked from OpenOffice.org in 2010, which was an open-sourced version of the earlier StarOffice. The LibreOffice suite comprises programs to do word processing, spreadsheets, slideshows, diagrams and drawings, maintain databases, and compose mathematical formulae.
- and the Apache OpenOffice Suite)
- **Apache OpenOffice (AOO)** is an open-source office productivity software suite. It is a successor project of OpenOffice.org that incorporates code merged from the IBM Lotus Symphony code base. Apache OpenOffice is a close cousin of LibreOffice and NeoOffice. It contains a word processor (Writer), a spreadsheet (Calc), a presentation application (Impress), a drawing application (Draw), a formula editor (Math), and a database management application (Base)..

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Open-source software development has been a large part of the creation of the World Wide Web as we know it, with Tim Berners-Lee contributing his HTML code development as the original platform upon which the internet is now built.