**Open-Source Software and Licensing**

**What is open source?**

Open-source software is software with source code that anyone can inspect, modify, and enhance.

"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 with access to the source code of a computer program can enhance the system by adding features to it or repairing sections that don't always work properly.

**How does open-source software vary from other types of software?**

Most software has source code that can be changed only by the individual, team, or organization that developed it — and retains sole control over it. That type of software is called "proprietary" or "closed source" software.

Only the original authors of proprietary software can legally copy, inspect, and alter that software. And 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. Microsoft Office and Adobe Photoshop are examples of proprietary software.

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.

**Open-source Licensing**

Open source licenses are licenses that comply with the Open Source Definition — in brief, they allow the software to be freely used, modified, and shared. To be approved by the Open Source Initiative (also known as the OSI), a license must go through the Open Source Initiative's license review process.

**Types of open source license**

There are generally two categories: permissive licenses and copyleft licenses.

A license that is permissive is simple and the most basic form of open source license. It allows you to do whatever you want with the software, as long as you abide by the requirements for notification. Permissive licenses provide the software as-is, with no warranties. So permissive licenses can be summarized as follows:

* Do whatever you want with the code
* Use at your own risk
* Acknowledge the author/contributor

Copyleft licenses add requirements to the permissive license. In addition to the requirements listed above, copyleft licenses also require that:

* If you distribute binaries, you must make the source code for those binaries available
* The source code must be available under the same copyleft terms under which you got the code
* You cannot place additional restrictions on the licensee's exercise of the license

**Popular Licenses**

The following OSI-approved licenses are popular, widely used, or have strong communities:

* Apache License 2.0
* BSD 3-Clause "New" or "Revised" license
* BSD 2-Clause "Simplified" or "FreeBSD" license
* GNU General Public License (GPL)
* GNU Library or "Lesser" General Public License (LGPL)
* MIT license
* Mozilla Public License 2.0
* Common Development and Distribution License
* Eclipse Public License version 2.0

**FSF and OSI**

**Free Software Foundation (FSF)**

The Free Software Foundation (FSF) is a nonprofit with a worldwide mission to promote computer user freedom. Free software is about having control over the technology we use in our homes, schools, and businesses, where computers work for our individual and communal benefit, not for proprietary software companies or governments who might seek to restrict and monitor us. The Free Software Foundation exclusively uses free software to perform its work.

The Free Software Foundation is working to secure freedom for computer users by promoting the development and use of free (as in freedom) software and documentation—particularly the GNU operating system—and by campaigning against threats to computer user freedom like Digital Restrictions Management (DRM) and software patents.

**Open Source Initiative (OSI)**

The Open Source Initiative (OSI) is a non-profit organization dedicated to the promotion of open-source software. OSI was founded in 1998 by **Bruce Perens and Eric Raymond**. OSI is quite distinct from the Free Software Foundation (FSF) led by Richard Stallman. Although they have similar history and motivation, OSI considers its ends as more pragmatic and business-driven, while FSF is based on anti-establishment and moralistic viewpoints. The OSI is actively engaged in building open source community, public advocacy, education, and promoting awareness regarding the significance of non-proprietary or open-source software. In order to establish an open-source environment around the world, OSI preserves and supports the Open Source Definition and also provides the OSI-Certified Open Source Software Certification Program. To achieve this OSI certification, the software should be distributed using a license that ensures the legal right to freely read, use, modify, and re-distribute the software.

**Desktop Applications**

**Firefox**

Mozilla Firefox, also known as the Firefox browser, or simply Firefox, is a free and open-source web browser developed by the Mozilla Foundation and its subsidiary, Mozilla Corporation. It is introduced in 2004 as part of the Mozilla Application Suite. Firefox included almost all the features offered by other browsers at that time, as well as a number of new features, including a bookmarks toolbar and tabbed browsing.

**Thunderbird**

Thunderbird is a free and open-source email, newsfeed, chat, and calendaring client, that’s easy to set up and customize.

**LibreOffice**

LibreOffice is community-driven and developed software, and is a project of the not-for-profit organization, The Document Foundation. LibreOffice is free and open-source software, originally based on OpenOffice.org (commonly known as OpenOffice), and is the most actively developed OpenOffice.org successor project. LibreOffice includes several applications that make it the most versatile Free and Open Source office suite on the market:

* Writer (word processing)
* Calc (spreadsheets)
* Impress (presentations)
* Draw (vector graphics and flowcharts)
* Base (databases)
* Math (formula editing)

**GIMP**

GIMP is an acronym for GNU Image Manipulation Program. It is a freely distributed program for such tasks as photo retouching, image composition, and image authoring.

**Server Applications**

**Apache Web Server**

Apache Web Server is an open-source web server creation, deployment, and management software. Initially developed by a group of software programmers, it is now maintained by the Apache Software Foundation. Apache Web Server is designed to create web servers that can host one or more HTTP-based websites. Notable features include the ability to support multiple programming languages, server-side scripting, an authentication mechanism, and database support. Apache Web Server can be enhanced by manipulating the code base or adding multiple extensions/add-ons.

**NGINX**

NGINX is open-source software for web serving, reverse proxying, caching, load balancing, media streaming, and more. It started as a web server designed for maximum performance and stability. In addition to its HTTP server capabilities, NGINX can also function as a proxy server for email (IMAP, POP3, and SMTP) and a reverse proxy and load balancer for HTTP, TCP, and UDP servers.

**MySQL**

MySQL was a free-software database engine originally developed and first released in 1995. It was originally produced under the GNU General Public License, in which source code is made freely available.

MySQL is very popular for Web-hosting applications because of its plethora of Web-optimized features like HTML data types, and because it's available for free. It is part of the Linux, Apache, MySQL, PHP (LAMP) architecture, a combination of platforms that are frequently used to deliver and support advanced Web applications. MySQL runs the back-end databases of some famous websites, including Wikipedia, Google, and Facebook- a testament to its stability and robustness.

**Samba**

Samba is an open-source software suite that runs on Unix/Linux based platforms but can communicate with Windows clients like a native application. So Samba can provide this service by employing the Common Internet File System (CIFS). At the heart of this CIFS is the Server Message Block (SMB) protocol.  
Samba performs:

* File & print services
* Authentication and Authorization
* Name resolution
* Service announcement (browsing)

ownCloud

ownCloud is a client-server suite of applications for creating and using file hosting service. The functionality of ownCloud is similar to dropbox. However, your files are stored on your connected hardware.

**Development** **Languages**

**Shell**

Shell is a command language interpreter that executes commands read from the standard input device such as a keyboard or from a file. A shell script is a list of commands in a computer program that is run by the Unix shell. The most common Linux shell is named Bash. The name is an acronym for Bourne-again shell. Bash (like many other shells) has the ability to run an entire script of commands, known as a "Bash shell script" (or "script").

**C**

C is a high-level and general-purpose programming language used for a wide range of applications from Operating systems like Windows and iOS to software that is used for creating 3D movies.

**Java**

Java is a high-level programming language originally developed by Sun Microsystems and released in 1995. Java runs on a variety of platforms, such as Windows, Mac OS, and the various versions of UNIX. Java is Platform Independent, portable, robust, and dynamic, with the ability to fit the needs of virtually any type of application.

**JavaScript**

JavaScript is a high-level, cross-platform, object-oriented computer programming language. It is also one of the core technologies of the web, along with HTML and CSS. JavaScript is used to create client-side dynamic web pages. Java and javascript are completely different and distinct languages.

**Perl**

Perl is a highly capable, feature-rich programming language with over 30 years of development. Perl runs on over 100 platforms from portables to mainframes and is suitable for both rapid prototyping and large scale development projects.

**Python**

Python is a high-level programming language, with applications in numerous areas, including web programming, scripting, scientific computing, and artificial intelligence. Python has extensive object-oriented programming support with a clean and consistent syntax.

**PHP**

PHP is a popular general-purpose scripting language that is especially suited to web development. Fast, flexible and pragmatic, PHP powers everything from your blog to the most popular websites in the world.

**Package Management Tools**

Contemporary distributions of Linux-based operating systems install software in pre-compiled packages, which are archives that contain binaries of software, configuration files, and information about dependencies. Furthermore, package management tools keep track of updates and upgrades so that the user doesn’t have to hunt down information about bug and security fixes. Without package management, users must ensure that all of the required dependencies for a piece of software are installed and up-to-date, compile the software from the source code (which takes time and introduces compiler-based variations from system to system), and manage configuration for each piece of software. Without package management, application files are located in the standard locations for the system to which the developers are accustomed, regardless of which system they’re using.

Package management systems attempt to solve these problems and are the tools through which developers attempt to increase the overall quality and coherence of a Linux-based operating system.

**dpkg**

On Linux operating systems that use Debian package management, the dpkg command queries, installs, removes, and maintains Debian software packages and their dependencies.

**apt-get**

APT stands for the Advanced Packaging Tool. apt-get is a command-line tool that helps in handling packages in Linux. Its main task is to retrieve the information and packages from the authenticated sources for installation, upgrade and removal of packages along with their dependencies.

**rpm: Red Hat Package Manager**

RPM Package Manager (also known simply as RPM), originally called the Red-hat Package Manager, is a program for installing, uninstalling, and managing software packages in Linux. It is an open packaging system, which runs on Red Hat Enterprise Linux as well as other Linux and UNIX systems.

**yum: yellowdog updater modified**

Yum is an automatic updater and package installer/remover for rpm systems. It automatically computes dependencies and figures out what things should occur to install packages. It makes it easier to maintain groups of machines without having to manually update each one using rpm. Yum has a plugin interface for adding simple features. Yum can also be used from other python programs via its module inteface.