

Software Livre e de Código Aberto

Fernando Castor

Centro de Informática – Universidade Federal de Pernambuco



Alguns direitos reservados



Exemplos de Software Livre e de Código Aberto



O que essas organizações tem em comum?



Software Livre

O que é Software Livre?

Ideologicamente

- ▶ Software cujos usuários têm liberdade para
 - ▶ executar
 - ▶ copiar
 - ▶ distribuir
 - ▶ estudar
 - ▶ modificar
 - ▶ melhorar
- ▶ Usuários **controlam** os programas e não o contrário
- ▶ **Premissa básica:** **liberdade** é uma **coisa boa** para indivíduos e sociedade
 - ▶ **Movimento Social**



O que é Software Livre?

Estritamente falando

Um programa é **livre** se seus usuários têm as 4 liberdades essenciais:

- 0 Liberdade de **executar** o programa, para qualquer fim.
- 1 Liberdade para **estudar** o funcionamento do programa e **modificá-lo** para fazer o que você **desejar**.
- 2 Liberdade para **redistribuir** cópias.
 - ▶ Assim, você ajuda seu vizinho.
- 3 Liberdade para **distribuir** cópias de suas **versões modificadas**.
 - ▶ Assim, a comunidade toda se beneficia com suas modificações.

Acesso ao código fonte é precondição para as liberdades 1 e 3.



O que é Software Livre?

Legalmente

- Software **distribuído** de acordo com uma **licença** que respeita as 4 liberdades



Quem é esse?

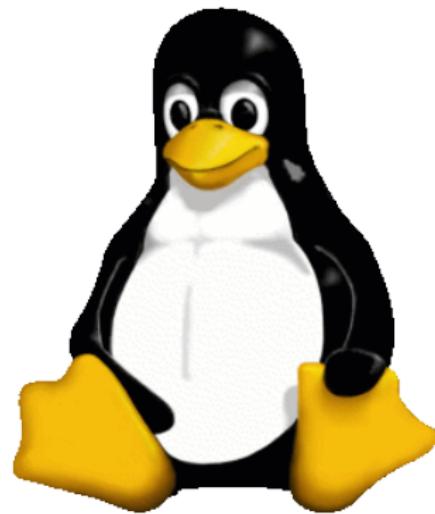


Richard M. Stallman

Este programa é software Livre?



Este programa é software Livre?



Este programa é software Livre?



(considerando apenas a versão gratuita)

Software de Código Aberto

O que é Software de Código Aberto?

Ideologicamente

O foco do movimento Open Source **não é ideológico**.

Em poucas palavras...

- ▶ “Campanha de Marketing” em prol do Software Livre
 - ▶ Com foco em vantagens práticas
 - ▶ Sem viés ideológico
 - ▶ Para chamar a atenção de grandes corporações

Por que “Código Aberto”?

- ▶ A palavra “free” em *Free Software* é problemática
 - ▶ “*Free as in freedom, not free beer*”



- Com “Código Aberto” a ênfase fica em algo mais palpável, o código

Quem são esses dois?



Eric Raymond e Bruce Perens

Código aberto não significa apenas acesso ao código fonte

Práticas

1. Desenvolvimento distribuído
2. Depuração em massa, com usuários envolvidos no desenvolvimento
3. Software disponível cedo e frequentemente
4. Meritocracia
5. Sem uma hierarquia rígida e sem coerção
6. Abertura do código fonte é uma pré-condição

Software de Código Aberto também tem uma definição

The screenshot shows the homepage of the Open Source Initiative. The header features the "open source initiative" logo and the text "Open Source Initiative". Below the header is a search bar with the placeholder "Search this site:" and a "Search" button. A navigation menu on the left includes links for "About the OSI", "The Open Source Definition", "Arbitration", "License Review Process", "License Prohibition", "Open Source Licenses", "Trademarks and Logo Usage", "FAQ", "Open Standards", "Open Source Education", "Mailing Lists", "Getting Help", "Donate to the OSI", "OSI Individual Membership", "OSI Affiliate Membership", "Contact OSI", "Terms of Service", and "OSI Corporate Sponsors". The main content area is titled "The Open Source Definition" and contains ten numbered sections: 1. Free Redistribution, 2. Source Code, 3. Derived Works, 4. Integrity of the Author's Source Code, 5. No Discrimination Against Persons or Groups, 6. No Discrimination Against Fields of Endeavor, 7. Distribution of License, 8. License Must Not Be Specific to a Product, 9. License Must Not Restrict Other Software, and 10. License Must Be Technology-Neutral. Each section has a brief description and a link to the full definition. At the bottom of the page is a footer with the text "OpenSource.org site content is licensed under a Creative Commons Attribution 3.0 License | Terms of Service", the "Creative Commons" logo, and logos for "U - F - P - E", "ca", "ines", "SPG", and "SOFTWARE-PUBLIC-PORTUGAL-GROUP".

“Open Source” é mais popular que “Free Software”

Google



redhat.

Microsoft®

ORACLE®

IBM

MySQL®



Centro
de Informática
U.F.P.E

INES

SPG
SOFTWARE-PUBLICO-PRIVATE-GROUP

Quem é esse?



Quem é esse?



Linus B. Torvalds

Uma palavrinha sobre o Linux...

Primeiras versões baseadas no MINIX

Disponível para o público desde outubro de 1991

A importância do Linux

- ▶ Núcleo usado no GNU (GNU/Linux)
- ▶ Feito notável de colaboração
 - Atualmente: Mais de 23000 desenvolvedores contribuindo
 - Informações interessantes: <https://www.openhub.net/p/linux>
- ▶ Principal exemplo de software livre que alcançou o **grande público**

Distribuições do Linux



TinyMe



VENENUX



elementary



MoonOS

Diferenças e Semelhanças entre FS e OSS

Em pouquíssimas palavras...

A democracia é um direito moral

vs

A democracia é o sistema mais
eficiente que se conhece

Aspectos Econômicos de Software Livre e de Código Aberto

Eu posso vender software livre? E de código aberto?

Resposta curta: **SIM!**

Na prática

- ▶ Não faz sentido
- ▶ E cobrar por instalações em máquinas, pode?
- ▶ Restringir uso comercial?

Quem contribui?

- ▶ Voluntários/entusiastas/nerds
- ▶ Entidades acadêmicas/governamentais
- ▶ e...

Corporações!!!!



Free as in free beer?

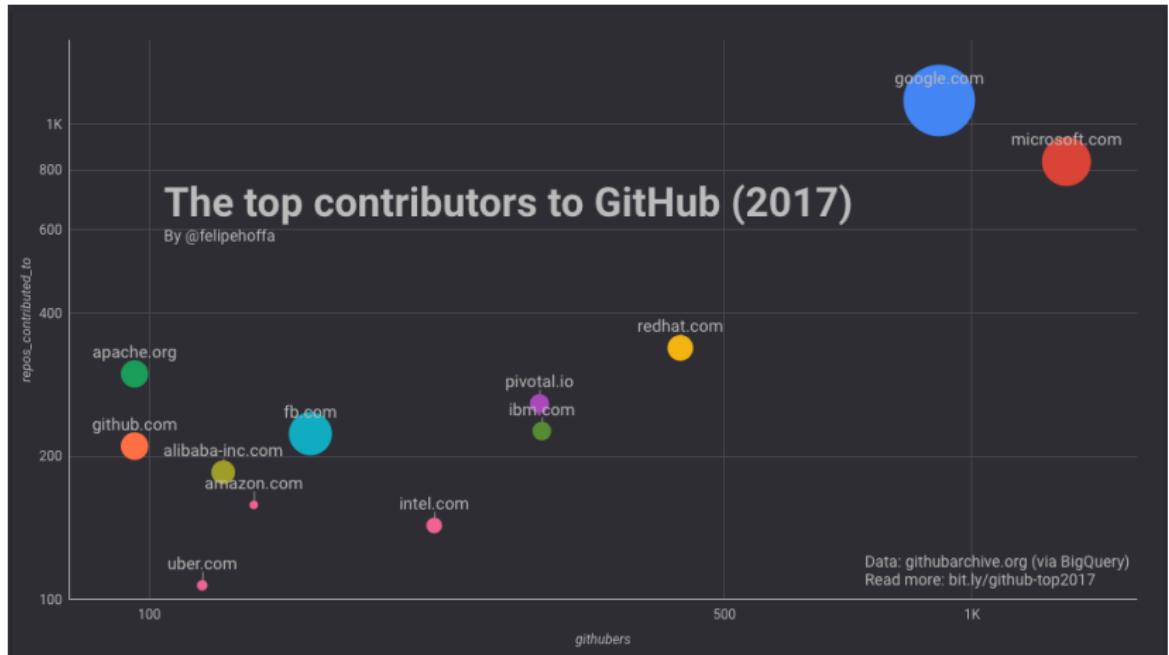
- ▶ A IBM gastou, entre 1995 e 2005, US\$ 1bi no Linux
 - ▶ Para fins de desenvolvimento e promoção

Free as in free beer?

- ▶ A IBM gastou, entre 1995 e 2005, US\$ 1bi no Linux
 - ▶ Para fins de desenvolvimento e promoção
- ▶ E, mais recentemente...

The screenshot shows a news article from WIRED magazine. The header is green with the WIRED logo and navigation links for BUSINESS, CULTURE, GEAR, IDEAS, and SCIENCE. The subheader is 'CLINT FONLEY BUSINESS 10.26.18 08:35 PM'. The main title is 'IBM Buying Open Source Specialist Red Hat for \$34 Billion'. Below the title is a photograph of Ginni Rometty, IBM CEO, speaking on stage. The caption below the photo reads: 'IBM CEO Ginni Rometty in Germany in June. © KRISZTIAN BOCSI/BLOOMBERG/GETTY IMAGES'.

IBM JUST SPENT \$34 billion to buy a software company that gives away its primary product for free.



Centro
de Informática
UFFPE



Free as in free beer?

- ▶ A Oracle (graças a **aquisições**) **era** dona, em 2010, de
 - ▶ MySQL
 - ▶ Java

Free as in free beer?

- ▶ A Oracle (graças a **aquisições**) **era** dona, em 2010, de
 - ▶ MySQL
 - ▶ Java
- ▶ O Google desenvolveu um dos melhores Web Browsers
 - ▶ E **abriu ele**, via projeto Chromium
 - ▶ Incluindo o **engenho V8** para JavaScript

A propósito, falando em Google...



Mais recentemente...



- ▶ 5+ anos de desenvolvimento (primeiro *commit* em 2010!)
- ▶ *open source um ano e meio depois de seu lançamento*

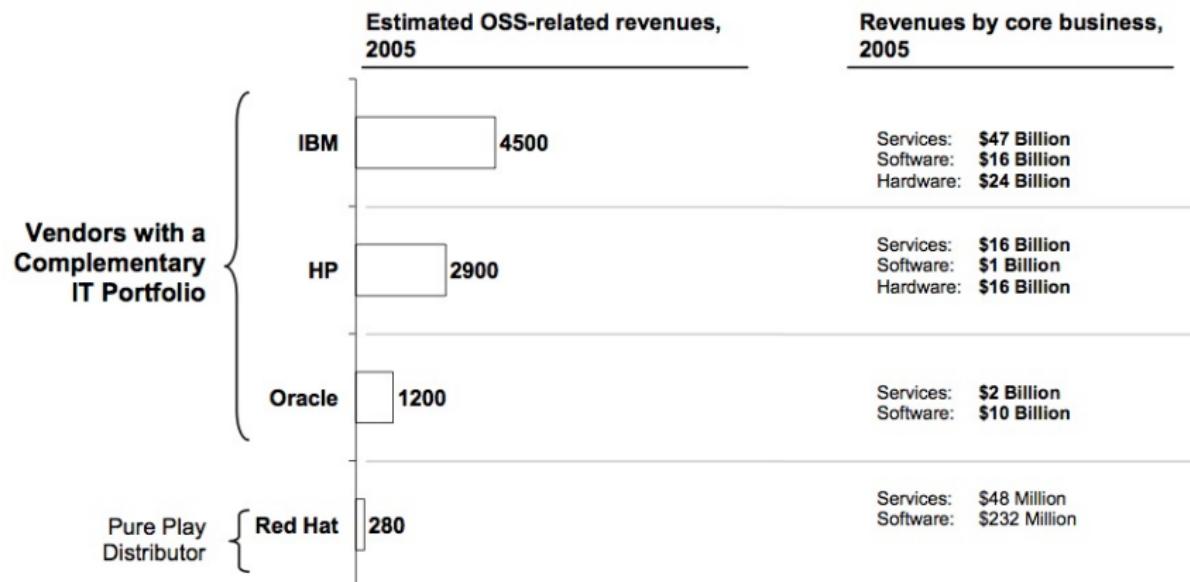


Receita relacionada a FLOSS vs. receita por área

Corporações não tem fins humanitários...

Receita relacionada a FLOSS vs. receita por área

Corporações não tem fins humanitários...





Como consumidores consomem mídia

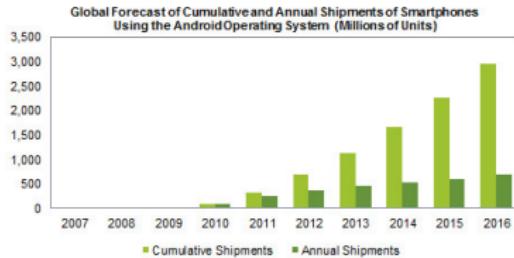
Dados de Out/2014. Google comprou a Android Inc. em 2005.

HOW CONSUMERS SPEND MEDIA TIME (HH:MM) EACH MONTH

— + CHANGE SINCE 2012 — - CHANGE SINCE 2012

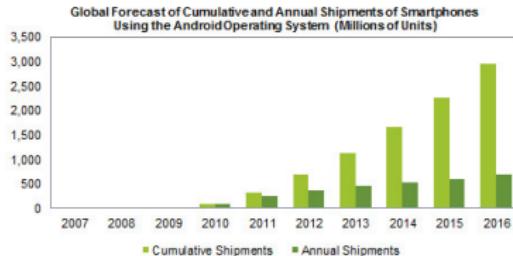


Smartphones com o sistema Android



Source: IHS iSuppli/Screen Digest Research September 2012

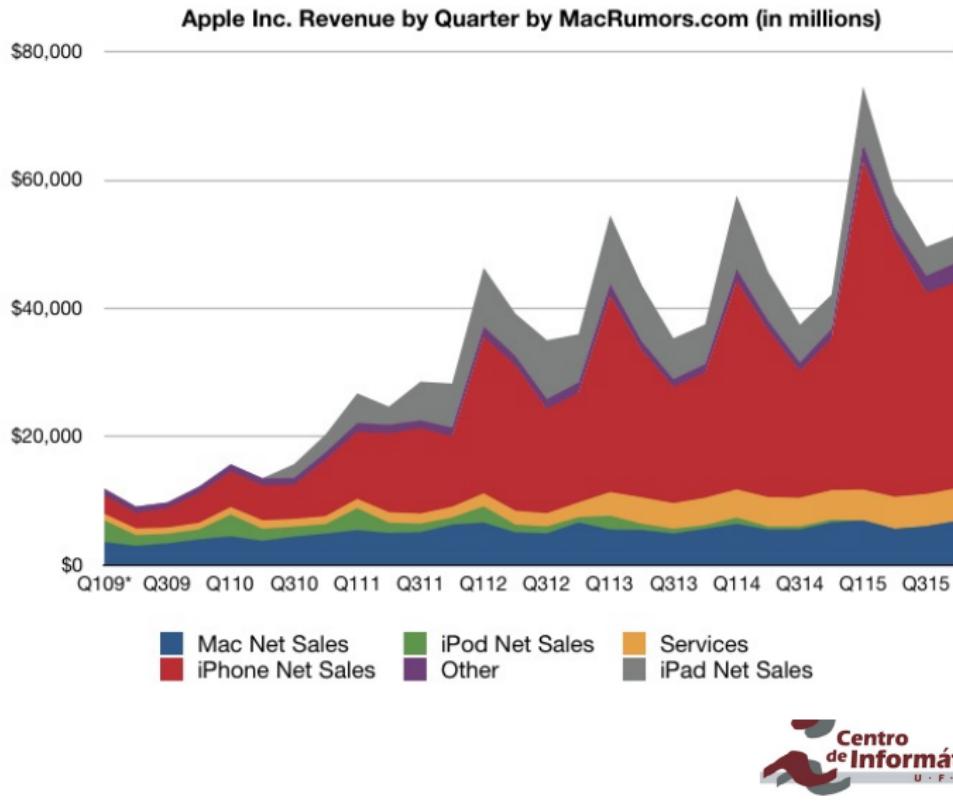
Smartphones com o sistema Android



Cada um desses smartphones...

- ▶ é um ponto de entrada para pessoas conectarem-se à Internet;
- ▶ funciona bem com as ferramentas do Google, incluindo Play Store;
- ▶ coleta informações que o Google pode usar.

Fontes de receita da Apple



Dois pontos de vista complementares

Software pode ou não ser um diferencial de negócios

1. Software livre não é a principal fonte de receita para IBM, HP, Google ou Apple
2. Mas **ajuda a dividir custos e riscos** para produtos que **não são um diferencial de negócios**

Dois pontos de vista complementares

Software pode ou não ser um diferencial de negócios

1. Software livre não é a principal fonte de receita para IBM, HP, Google ou Apple
2. Mas **ajuda a dividir custos e riscos** para produtos que **não são um diferencial de negócios**
3. Se software não é a diferenciação, é um centro de **custo**, não de **lucros**

Dois pontos de vista complementares

Software pode ou não ser um diferencial de negócios

1. Software livre não é a principal fonte de receita para IBM, HP, Google ou Apple
2. Mas **ajuda a dividir custos e riscos** para produtos que **não são um diferencial de negócios**
3. Se software não é a diferenciação, é um centro de **custo**, não de **lucros**

Tecnologia meio vs. tecnologia fim

1. Software pode ser uma tecnologia “possibilitadora”
2. Desenvolvimento de software proprietário é uma **minoria**
 - Menos de 10% das vagas para desenvolvimento de software
 - Mais de 70% estão em empresas que são **usuárias de TI**

Se tiverem que aprender apenas uma coisa, aprendam isso

Vale a pena abrir o código para

1. software que **não é um diferencial** de negócios
2. software que é uma **tecnologia possibilitadora** para vários negócios

Porque os custos e o risco do desenvolvimento são divididos

Como Você Pode se Beneficiar?

Software livre é grátis

Pode aumentar sua empregabilidade!

Education



Experience

- *September 2009 - December 2009.* Travelled from Japan to England without flying.
- *December 2008 - September 2009.* Mathematical Systems, Tokyo: statistical software consultancy. Member of Knowledge Engineering team doing custom development in Common Lisp for NTT.
 - Monitoring system for large numbers (100k) of routers, with Holt-Winters' seasonal exponential time series forecasting to detect aberrations.
 - Visualisation of large (cyclic) directed graphs by condensing nodes while attempting to preserve the graph structure.
 - Efficient storage and retrieval of routing tables.
 - Portable persistent memory-mapped object database integrating into Lisp object system with the Meta-Object Protocol (MOP), including a precise computing garbage collector and atomic transactions (*transactor*).
- *January 2006 - November 2008.* Travelled in the Middle East, South East Asia, China, North Korea, India, and Japan.
- *October 2004 - December 2005.* Alphamosaic (bought by Broadcom), Cambridge: semiconductor company specialising in low-power video. Engineer on the software research team.
 - Embedded C software development; system-wide and video codec performance optimization, dynamic DMA resource management infrastructure, lightweight reliable mutual exclusion without malloc, H.264 video decode (dramatically increased performance of an already heavily optimized system, directly benefiting the video iPod project), virtual file system layer, device drivers.
 - Algorithm evaluation for hardware design: image sensor pipeline (image processing in Matlab), and simulated performance of different i-cache and d-cache sizes and associativities.
 - On-site customer support at Samsung on DMB (mobile TV) phone project. Starting with a dysfunctional project, rebuilt trust with Samsung.
 - High-level ASIC design and software emulation of components for next generation platform (JPEG acceleration).
- *Winter 2003.* Volunteer at NGO wifi ISP in Mozambique.
- *Easter 2003.* Hospital in Bethlehem. Volunteer IT system administrator. Continued regularly until 2007.
- *2002-2004.* Trinity College Students' Union.
- *2001-2002.* Cambridge University Computing Society. Chairman.
- *Summer 2000.* Linux Information Systems AG, Munich: productivity software start-up. Intern.
- *Spring 2000.* Linux kernel. Contributor. USB driver for a scanner; accepted and integrated into the Linux kernel (`/drivers/usb/microlink.c`). Usenspace program to assist reverse engineering (`usb-robo`).
- *1998.* Unreleased game framework in C++ with dynamic code generation.

Recent hobby projects

- `teepedece2`: a high-performance web application platform in Common Lisp, directly calling Linux system calls. Benchmarked serving more than 10k dynamically generated pages per second on one processor core.
- `dyslinkycom`, ranked seventh out of about three hundred teams in the ICFP 2009 programming competition.

Pode aumentar sua empregabilidade!

Education

Experience

- *September 2009 - December 2009.* Travelled from Japan to England without flying.
- *December 2008 - September 2009.* Mathematical Systems, Tokyo: statistical software consultancy. Member of Knowledge Engineering team doing custom development in Common Lisp for NTT.
 - Monitoring system for large numbers (100k) of routers, with Holt-Winters' seasonal exponential time series forecasting to detect aberrations.
 - Visualisation of large (cyclic) directed graphs by condensing nodes while attempting to preserve the graph structure.
 - Efficient storage and retrieval of routing tables.
 - Portable persistent memory-mapped object database integrating into Lisp object system with the Meta-Object Protocol (MOP), including a precise computing garbage collector and atomic transactions (mainly).
- *January 2006 - November 2008.* Travelled in the Middle East, South East Asia, China, North Korea, India, and Japan.
- *October 2004 - December 2005.* Alphamosaic (bought by Broadcom), Cambridge: semiconductor company specialising in low-power video. Engineer on the software research team.
 - Embedded C software development; system-wide and video codec performance optimization, dynamic DMA resource management infrastructure, lightweight reliable mutual exclusion without malloc, H.264 video decode (dramatically increased performance of an already heavily optimized system, directly benefiting the video iPod project), virtual filesystem layer, device drivers.
 - Algorithm evaluation for hardware design: image sensor pipeline (image processing in Matlab), and simulated performance of different i-cache and d-cache sizes and associativities.
 - On-site customer support at Samsung on DMB (mobile TV) phone project. Starting with a dysfunctional project, rebuilt trust with Samsung.
 - High-level ASIC design and software emulation of components for next generation platform (JPEG acceleration).
- *Winter 2003.* Volunteer at NGO with ISP in Mozambique.
- *Easter 2003.* Hospital in Bethlehem. Volunteer IT system administrator. Continued regularly until 2007.
- *2002-2004.* Trinity College Students' Union.
- *2001-2002.* Cambridge University Computing Society. Chairman.
- *Summer 2000.* Linux Information Systems AG, Munich: productivity software start-up. Intern.
- **Spring 2000.** Linux kernel. Contributor. USB driver for a scanner; accepted and integrated into the Linux kernel (`/drivers/usb/microtek.c`). Userspace program to assist reverse engineering (`usb-robot`).
- *1998.* Unreleased game framework in C++ with dynamic code generation.

Recent hobby projects

- `teepedee2`: a high-performance web application platform in Common Lisp, directly calling Linux system calls. Benchmarked serving more than 10k dynamically generated pages per second on one processor core.
- `dyslinkycom`, ranked seventh out of about three hundred teams in the ICFP 2009 programming competition.

- *Spring 2000.* Linux kernel. Contributor. USB driver for a scanner; accepted an (drivers/usb/microtek.c). Userspace program to assist reverse engineering (usb-r

Há muitas oportunidades para trabalhar com FLOSS!

 CAREERS 2.0
by stackoverflow

home search jobs companies my profile for employers »

368 jobs 151 company pages

368 Open Source jobs sort by: Search relevance

★ **Big Data Architect** Bloomberg L.P. - New York, NY 1 week ago
The RoleWe are looking for individuals with experience in Big Data Technologies such as BigTable, Ha...
hadoop cassandra rdbms cloud open-source

★ **Innovation Engineer** Consumer Reports - New York, NY 2 weeks ago
The Innovation Engineer is a key role in the TIC (Technology Innovation Center) located in New York City...
frontend api backend open-source agile

★ **Analyst/Programmer (Foundation) - Library** California State University San Marcos - San Marcos, CA 1 week ago
California State University San MarcosAnalyst/Programmer (Foundation)LibraryUnder the direction of the...

★ **Software Engineer** CrowdSurge - New York City, NY 2 days ago
ABOUT US:Our company was established in January 2008 to provide white-label e-commerce softwar...
go c c++ python java

★ **Senior Mobile Software Architect** Jun Group Productions LLC - New York City, NY 1 week ago
Writing code is like writing a novel. It's an art form that many practice but few can do well. So who's...
jruby ruby java rails javascript

★ **Senior Software Engineer, DevOps -000000099674** Nokia - Berlin, Germany 2 days ago
HERE, a Nokia business, offers the world's freshest maps and location experiences across multiple...
splunk cmake linux c++ python

★ **DevOps/System Administrator** Pontifex - New York, NY 4 weeks ago

search jobs

what *open source*
where city, country or zip code
distance (use slider) 20 miles
 Work remotely
 Offers relocation

search view all

company spotlight

StackExchange 

Join the team that brought you Stack Overflow, Server Fault, Careers 2.0 and the Stack Exchange network.

[View Stack Exchange job listings](#)

Looking for a job?

Create a Careers 2.0 profile and let employers come to you.

- Employers search our database and contact you
- Import easily from LinkedIn
- Link to Stack Overflow, GitHub, CodePlex and more

[Request an invitation](#)
Profiles are invitation only



Há muitas oportunidades para trabalhar com FLOSS!

[Find Jobs](#) [Find Resumes](#) [Employers / Post Job](#)



what:

where:

city, state, or zip

[Find Jobs](#)

[Advanced Job Search](#)

Open Source developer jobs

My recent searches

[Open Source - 8,487 new](#)
[Open Source Developer - 2,084 new](#)

[x clear searches](#)

Sort by: **relevance - date**

▼ Salary Estimate

\$50,000+ (6797)
\$70,000+ (4839)
\$90,000+ (2468)
\$110,000+ (1026)
\$130,000+ (463)

► Title

► Company

► Location

► Job Type

► Employer/Recruiter

Tip: Enter your zip code in the "where" box to show results in your area.

- Let employers find you

Jobs 1 to 10 of 7,624

Ads

Lightweight App Server

[www.ibm.com/open_plus](#) Speed App Development & Deployment w/Liberty & WebSphere App Servers.

Open-Source Test Software

[www.kulanaga.com/](#) Wraps Selenium, TestNG, SoapUI & More. Free Download & Support!

Accenture Linux Jobs

[www.accenture.com/](#) Careers for Linux Experts. Develop Your Potential at Accenture

Show: [all jobs](#) - [2,084 new jobs](#) - only 'Easy Apply' jobs

Open Source Developer - new

Scholastic  [97 reviews](#) - New York, NY

The Digital Services Group of Scholastic, Inc is seeking a full time **Open Source Developer** to assist in the creation and management of **Open Source** development...

1 day ago - [save job](#) • [email](#) • [more...](#)

Senior Open Source Developer - new

Samsung Information Systems America, Inc. (SISA)  [400 reviews](#) - San Jose, CA

reviewer, maintainer, etc., and have a passion for **open source** software, enjoy collaborating with the global community of **open source** developers, and...

Samsung - 6 days ago - [save job](#) • [email](#) • [more...](#)

Senior Open Source Web Developer - Oldham - £35k - new

Stephen James Consulting - Alabama

Our client a leading multi-faceted technology company are searching for a Senior **Open Source**

Web Developer to be responsible for developing innovative, reusable... \$30,000 - \$35,000 a year
Lofredemplio - 5 days ago - [save job](#) • [email](#) • [more...](#)

Open Source Software Developer - new

HireNetworks - Durham, NC

Job Responsibilities of the **Open Source Software Developer** include:.. Translation of business

requirements into working code.... \$70,000 - \$100,000 a year

5 days ago - [save job](#) • [email](#) • [more...](#)

Java Web Open Source Developer - new

Sua empresa pode economizar!

BLACK DUCK SOFTWARE ESTIMATES DEVELOPMENT COST OF OPEN SOURCE SOFTWARE AT \$387 BILLION



Reuse of Open Source Software Could Save U.S. Companies \$22 Billion a Year

WALTHAM, Mass., April 14, 2009 - Black Duck Software, a leading provider of products and services for accelerating software development through the managed use of open source software (OSS), estimates the total development cost of open source software at more than \$387 Billion U.S.

To put this figure into perspective, the cost to develop open source software code is equivalent to nearly 50 percent of the U.S. government's recently passed stimulus bill, the \$787 billion "American Recovery and Reinvestment Act."

Black Duck Software has the industry's most comprehensive database of open source software and related metadata. According to the company's research, there are over 200,000 open source projects representing over 4.9 billion lines of code. Using its detailed knowledge of open source projects and applying standard industry cost estimation techniques, Black Duck estimates that the total development cost of OSS exceeds \$387 billion and represents a collective investment of more than two million developer years.

An additional analysis, which estimates that 10 percent of IT application development spending is redundant with existing open source projects, indicates U.S. companies could realize savings of more than \$22 billion a year through the reuse of OSS in application development.

Sua empresa pode economizar!

BLACK DUCK SOFTWARE ESTIMATES DEVELOPMENT COST OF OPEN SOURCE SOFTWARE AT \$387 BILLION



Reuse of Open Source Software Could Save U.S. Companies \$22 Billion a Year

WALTHAM, Mass., April 14, 2009 - Black Duck Software, a leading provider of products and services for accelerating software development through the managed use of open source software (OSS), estimates the total development cost of open source software at more than \$387 Billion U.S.

To put this figure into perspective, the cost to develop open source software code is equivalent to nearly 50 percent of the U.S. government's recently passed stimulus bill, the \$787 billion "American Recovery and Reinvestment Act."

Black Duck Software has the industry's most comprehensive database of open source software and related metadata. According to the company's research, there are over 200,000 open source projects representing over 4.9 billion lines of code. Using its detailed knowledge of open source projects and applying standard industry cost estimation techniques, Black Duck estimates that the total development cost of OSS exceeds \$387 billion and represents a collective investment of more than two million developer years.

An additional analysis, which estimates that 10 percent of IT application development spending is redundant with existing open source projects, indicates U.S. companies could realize savings of more than \$22 billion a year through the reuse of OSS in application development.

Fonte de dados para pesquisa

MSR 2017

The 14th International Conference on Mining Software Repositories
May 20-21, 2017. Buenos Aires, Argentina.



[Home](#) [Program](#) [Mining Challenge](#) [Data Showcase](#) [MSR Awards](#) [Registration](#) [Venue](#) [Dates](#) [Hall of Fame](#) [Organization](#)

Welcome to the official website of MSR 2017!

The Mining Software Repositories (MSR) field analyzes the rich data available in software repositories to uncover interesting and actionable information about software systems and projects. The goal of this two-day conference is to advance the science and practice of MSR. The 14th International Conference on Mining Software Repositories is sponsored by IEEE TCSE, ACM SIGSOFT, and SADIO.

The MSR conference is co-located with ICSE 2017, at **Buenos Aires, Argentina, 20-21 May, 2017**.

Call For Papers

Software repositories such as source control systems, archived communications between project personnel, and defect tracking systems are used to help manage the progress of software projects. Software practitioners and researchers are recognizing the benefits of mining this information to support the maintenance of software systems, improve software design/reuse, and empirically validate novel ideas and techniques. Research is now proceeding to uncover the ways in which mining these repositories can help to understand software development and software evolution, to support predictions about software development, and to exploit this knowledge in planning future development. The goal of this two-day international

Obrigado!

Resumo

- ▶ (0) executar, (1) estudar e modificar, (2) distribuir e (3) distribuir versões modificadas
- ▶ Software Livre e Software de Código Aberto são dois lados da mesma moeda
- ▶ Vale a pena abrir o código para
 1. software que **não é um diferencial** de negócios
 2. software que é uma **tecnologia possibilitadora** para vários negócios
- ▶ Há muitas formas de se beneficiar profissionalmente com FLOSS

Slides: https://github.com/fernandocastor/software_livre

Licença



Você tem o direito de:

Compartilhar — copiar e redistribuir o material em qualquer formato

Adaptar — remixar, transformar, e criar a partir do material

De acordo com os seguintes termos:

Attribution — Você deve atribuir o devido crédito, fornecer um link para a licença e indicar se foram feitas alterações. Você pode fazê-lo de qualquer forma razoável, mas não de uma forma que sugira que o licenciante o apoia ou aprova o seu uso.

NonCommercial — Você não pode usar o material para fins comerciais.

ShareAlike — Se você remixar, transformar ou criar a partir do material, tem de distribuir suas contribuições sob a mesma licença



Mais informações em <http://creativecommons.org/licenses/by-nc-sa/3.0/br/>