

Google and Open Source

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Who Am I ?

- Engineer in Google Open Source Programs Office

- What do we do ?

- License Compliance
- Code Release
- The Summer of Code
- Protocol, specification and API Licensing
- Specific Open Source Projects (Samba, git)

- Also:

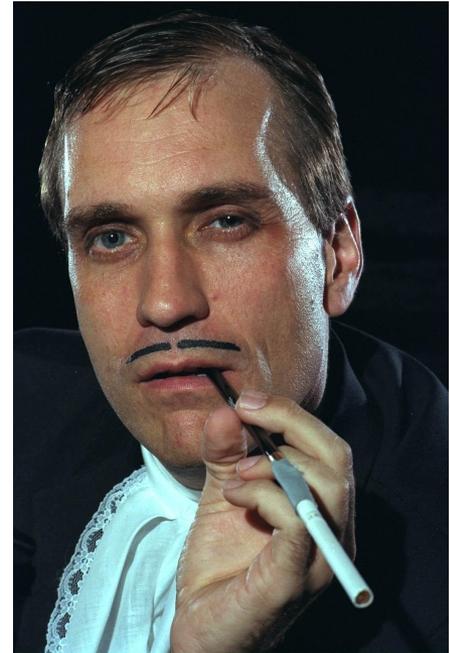
Co-creator of Samba.

Board of Directors of the Software Freedom Conservancy

Represent Google on the Gnome Foundation Board

Represent Google to the Document Foundation (LibreOffice)

Interviewer of Free Software personalities for Google Open Source Blog (etc.)



A Bit About Open Source

License Use Across 31m Crawled Files

FLOSS License	De Duped Files	Percentage
GPL	14,851,615	47.06%
LGPL	7,145,795	22.64%
BSD	4,245,335	13.45%
Apache	1,778,692	5.64%
MIT	1,565,673	4.96%
Mozilla	567,604	1.80%
Perl	333,829	1.06%
QPL	206,085	0.65%
Artistic	150,555	0.48%
CPL	144,128	0.46%

Why do people **release** code at all?

A BCG/OSDN Study found that open source developers are motivated by:

- Intellectual Curiosity/Stimulation (44.9%)
- Skills Improvement (41.3%)
- Work needs (33.8 %)
- Open Source Idealism (33.1%)
- Non-Work Functionality (29.7%)
- Professional Status (17.5%)
- Reputation building within Open Source (11%)
- Dislike/distrust of proprietary software (11.1%)

<http://osdn.com/bcg>

Implications:

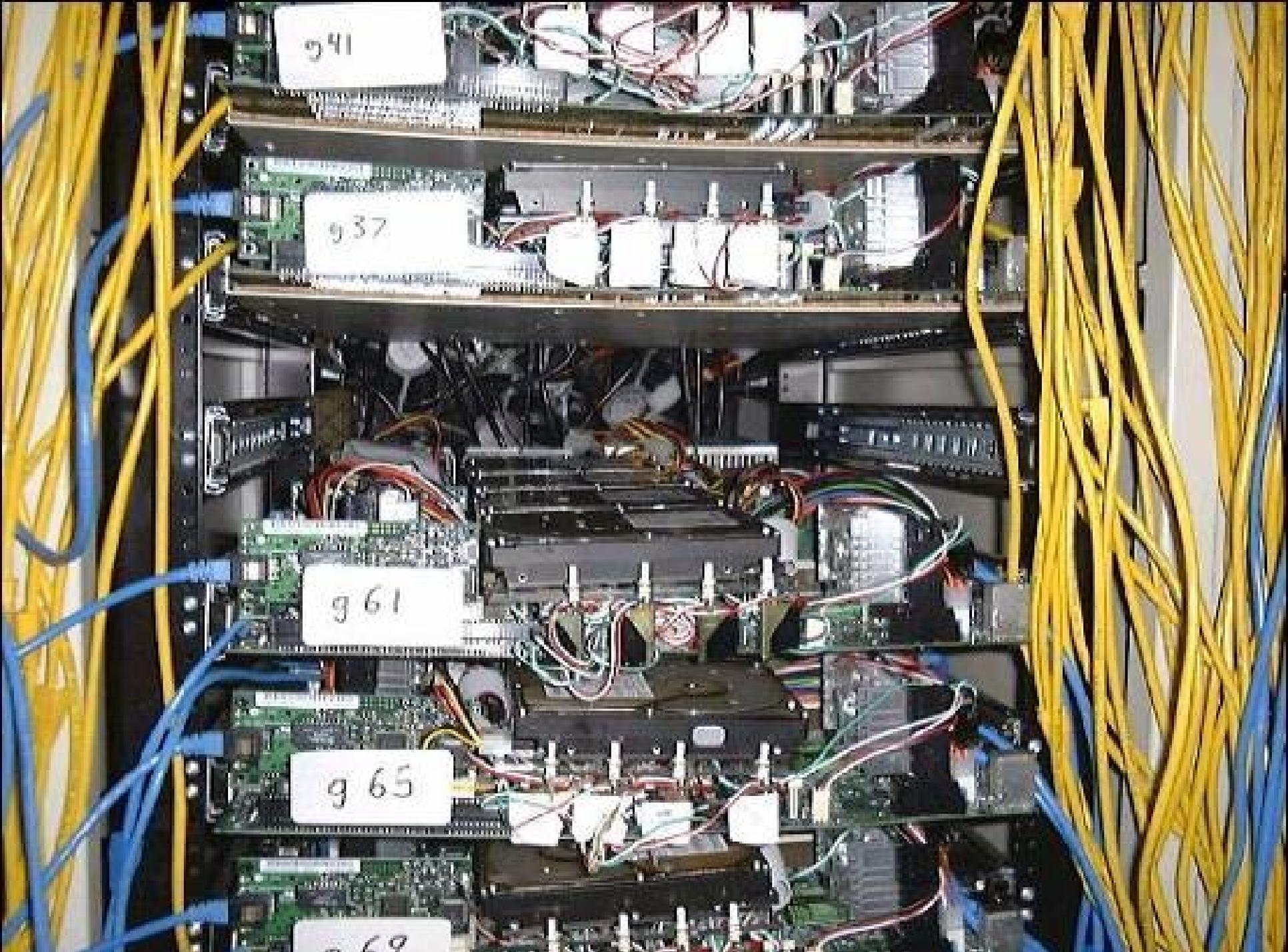
- FLOSS developers **understand** OSS licenses.
- They know they are “**giving away**” their software.
- They know and hope people will use it.
- The majority expect no more \$\$\$ for the work.
- If they did, they’d just do it as a commercial offering, if they can.
- Which is pretty remarkable....

The Result:

- Enterprise-level software is being created and released by professionals for free, under licenses which encourage commercialization and reuse
- If you're building a business that uses software without basing it on Open Source/Free Software you are throwing money away
- Almost every new product containing an embedded computer is being built with Open Source/Free Software
 - Phones, TV's, Cars, DVRs, Networks – too many to list
- Which is even *more* remarkable

Google and Open Source





g41

g37

g61

g65

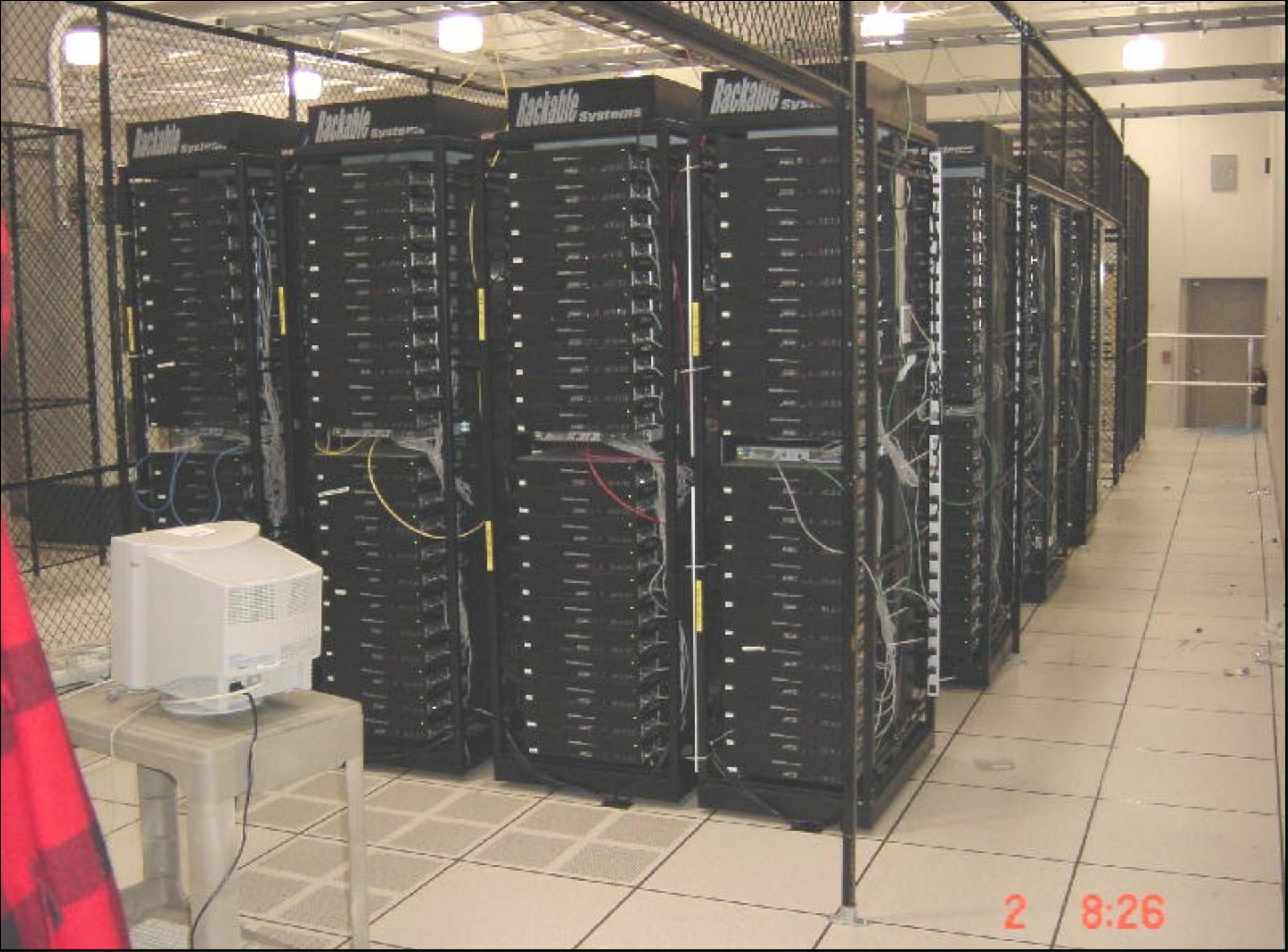
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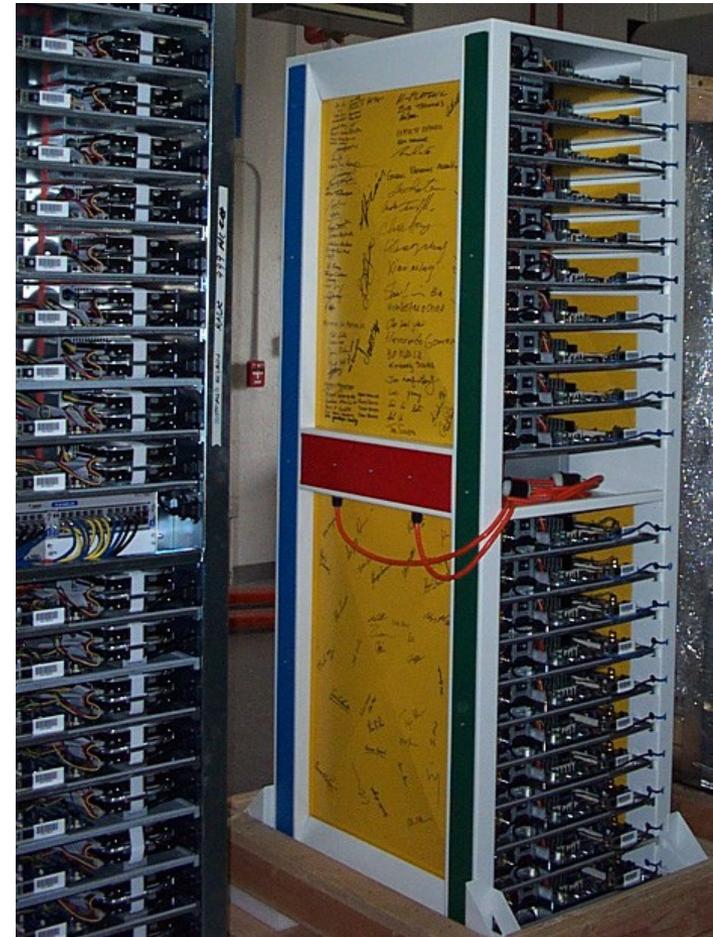
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What is 'Google'

- In-house rack design
- PC-class motherboards
- Low-end hardware, mostly
- Running Linux + in-house software



How does Google use Open Source?

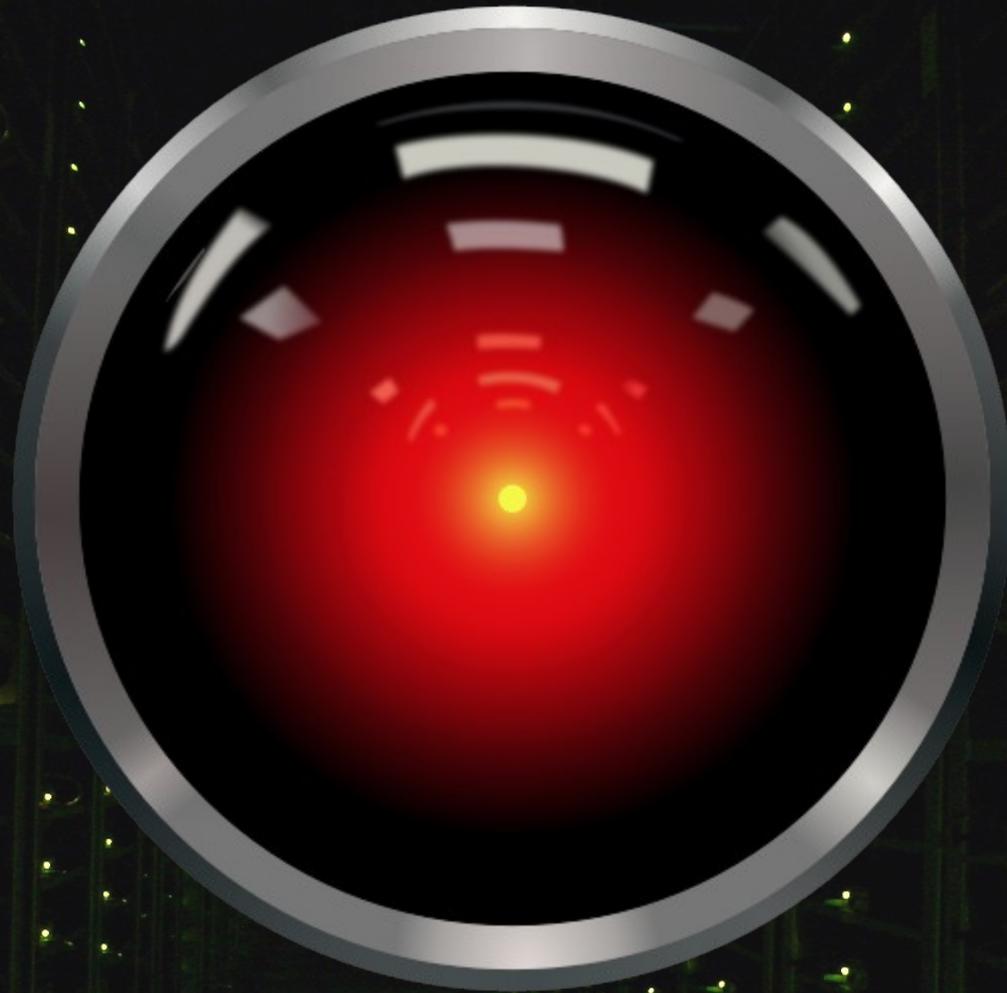
As Infrastructure

- Linux kernel
- Many Apache Project Tools
- SSH, and other system management tools
- The Languages and compilers that we use (gcc, llvm, Java, Go, Python).
- Engineers and others running Linux (Goobuntu)

As building blocks

- Our repositories have thousands of libraries used in Google software
- (Mostly) automated process tracks license use

Why does Google use Open Source ?



“I'm sorry Google, I can't let you do that..”

But Why does Google use Open Source

(and why you should too)

Control and Ownership

- Maintain our independence from external software companies

Adaptability and Flexibility

- We can drill down to repair and enhance our services
- If we want to do something out of the ordinary, we can do so without showing our hand
- No one is incentivized to hurt us

Roots

- Appeals to the Google ethic

(It's really all the reasons to use Free Software but people are scared of the 'F' word ..)

But we're not Google !

You don't have to be Google to take advantage of Open Source/Free Software

In times of austerity, use resources to build up LOCAL talents and businesses

- Programmers live everywhere – no country has a monopoly on smart people
- Invest in your own PEOPLE, not in becoming mere users of someone else's software
- Fund local improvements, take control of your own IT

Create local communities around the software you use

- Ensure a pool of talent you can draw on for improvements, documentation
- Encourage commercialization of Free Software/Open Source

How does Google take part?

Google's Open Source Programs

Patching and Code Release

Internal License Discipline

API/Protocol License Discipline

Open Source Infrastructure & Leadership

Summer of Code

Donations/Funding/Sponsorship

Industry Trade Group Participation

Open Source **Infrastructure**

Hosting on Google Code which provides:

- Reliable, scalable, clean project Hosting
- Version Control (git,hg, svn)
- Issue/Bug Tracking
- Wikis

Over 600k projects of projects, now the 2nd Largest Repository Online

We **release** open source code

- We **Patch** into hundreds of projects each month
 - Strategically important
 - Helps the Internet grow fairly.
- >3400 small projects to date.
 - API Examples
 - Dev Tools
 - Linker
 - Build/test
 - Memory and thread management
 - Plug-ins for eclipse
 - DVCS patches (git and jgit).
 - Infrastructure
 - Approximately 30m lines of code released
 - Some across many large projects..
 - Samba for example

Large Project Releases?

Major Projects: Chromium/ChromiumOS



- What is it: A browser
- What license: Mostly BSD (some LGPL)
- What does it do?
 - Incredibly Fast
 - Safe, smart, sandboxing
 - Multiple processes/tab.
 - Implements HTML5
 - Offline, Worker pools, Geo-location, File uploading
- Desktop like experiences inside the browser
- ChromiumOS
 - *“Reducing Linux to a poorly debugged set of device drivers” :-)*

Major Projects: Android

- What is it: Full cell phone OS.
- What license: Apache + Linux Kernel
- What does it do?
 - Raises the minimum bar for smart phone OS'
 - Allows for a solid web experience
 - Allow for multiple applications to co-exist.
 - Provides a smart app marketplace
 - Makes cell phone development a snap
 - Base platform to create a tablet market
- 1,000,000+ devices activated daily



WebM

- What it is: WebM is an open, royalty-free, media file format designed for the web.
 - Vorbis Audio
 - Vp8 video
 - In a matroska-like (MKV) container
- Very high quality
- Releasing in a very open source way.
 - BSD licensed
 - Patents granted freely, no fees required.
- Our goal is to get html5 to recognize webm as a standard codec for web video/audio.



Other significant open source technology releases

- WebP
- WebRTC
- Omaha
- Ganeti
- Android ADK robot code (and ADK!)
- White spaces Geographical database
- M-Lab (600Tb of network speed surveys)
 - <http://measurementlab.net/>

Summer of Code



The Summer Of Code, 2012

1219 students

170 Organizations

Over 2000 Mentors

>6000 applications

87 Countries

86% pass rate!

~3 million lines of code in 2011 alone

(~21m since 2005)

How it Works

- 1) Student **applies** to work on a project for, say, the ASF
- 2) ASF mentors **review** the application and accept the student
- 3) Google pays student \$**500** for being **accepted**
- 4) Student **works** with an ASF mentor to create project
- 5) Mid-Term, **good** students are paid \$**2250** by Google
- 6) Student continues **work** with mentor to create project
- 7) Final: If the student has **completed** the goals set forth in the application and student is paid \$**2250** by Google
- 8) Successful student gets **t-shirt**, certificate and valuable experience along with the money.

Sponsorship



Google OSPO sponsors many FLOSS organizations both commercial and non-profit

Linux Foundation

Gnome Foundation

Document Foundation

Free Software Foundation

Software Freedom Conservancy

Apache Foundation

Samba Team

(and many more)

Google and Standards

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Google strongly supports Internet Standards

Vint Cerf (one of the “Fathers of the Internet”) is the head of Google's Standards Group

Ian Hickson (author and maintainer of HTML5 specification) works for Google OSPO

Google is *built* on Internet Standards

Open Source/Free Software needs open standards to interoperate with proprietary systems

Google and Standards

Data Liberation Front



- Can I get my data out in an open, interoperable, portable format ?
- How much is it going to cost to get my data out ?
- How much of my time is it going to take to get my data out?

The End

Questions?



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<http://code.google.com/opensource>