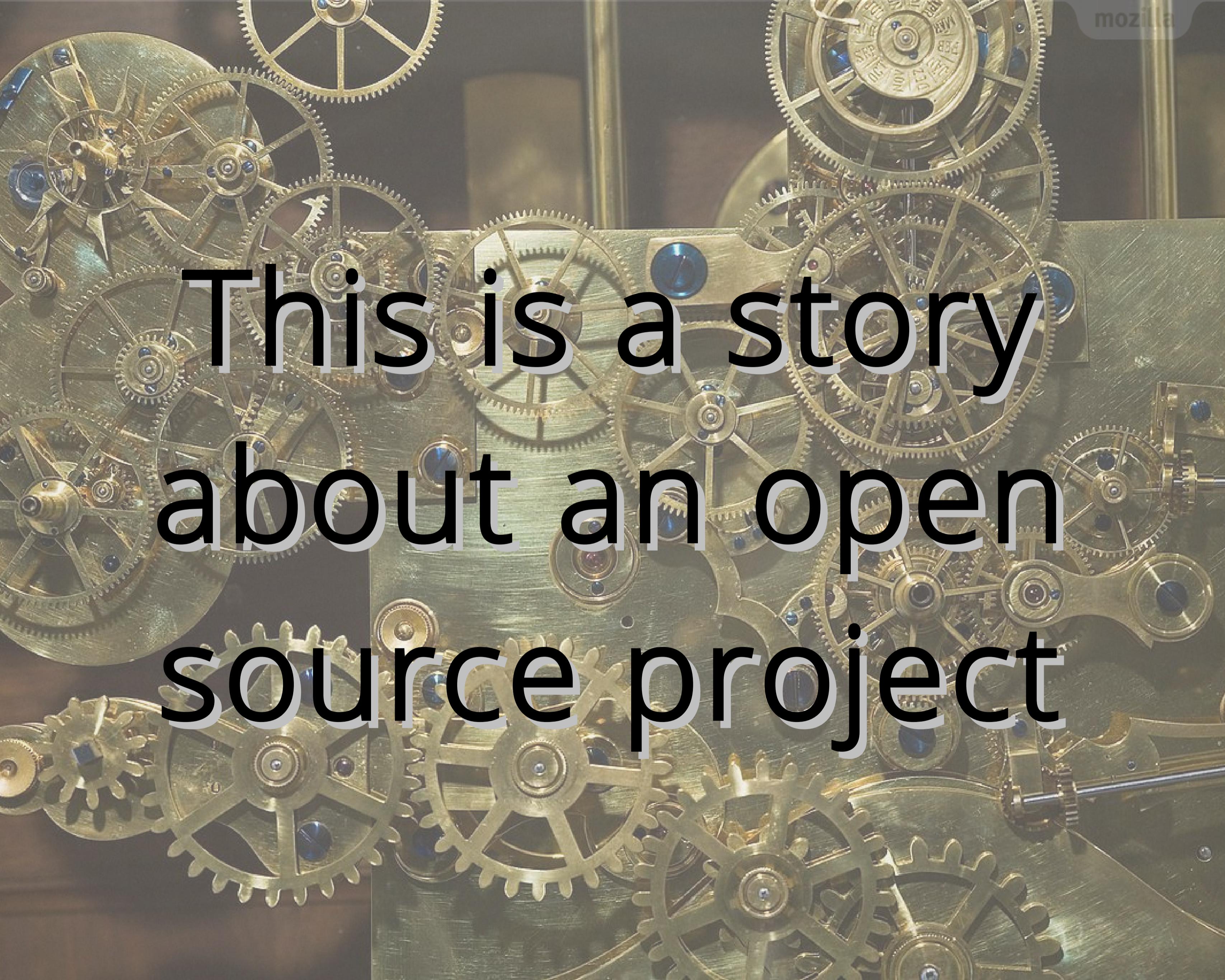




*- a hobby project with a billion users*

Daniel Stenberg,  
Google Tech Talk  
August 26<sup>th</sup> 2015



This is a story  
about an open  
source project

# Daniel Stenberg

**mozilla**

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Twitter: [@bagder](#)

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Blog: [daniel.haxx.se/blog](http://daniel.haxx.se/blog)

Please ask!

$$\text{process}(k) \sim Q(42) \rightarrow S_a \rightarrow S_a(1/2) k = 4 \sqrt{23^2 + 41(k)} \text{ cm or brighter}$$

$$S_a = 17 \times 10 / 23^2 \times 41(k-4)$$

$$\sqrt{(m-a)} < \chi^2 [20 \times 20]$$

$$\text{imp. Deviations: } \frac{72^{-2}}{72} \quad \frac{72^{-3}}{72}$$

$$\text{dev is greater than } 0^{-2} \times 42(s)$$

$$0 \text{ for every } S^2 \{ 23^2 \}$$

$$\boxed{\begin{array}{l} \text{or} \\ \text{if } \frac{72}{72} \leq 10^2 \end{array}}$$

$$\text{Probability factors } 10^2 \text{ double negative standing} \quad \frac{32(k) \times 32}{\Sigma (7) P_{32}}$$



negative  
over  
variance

$5 \times 4$

$2 \times 12$

$4 \times 12$

$2 \times 12$

$1 \times 12$

$1 \times 12$

$\int_0^{\infty} J_k^2(k) dk$

$\int_0^{\infty} J_k^2(k) dk$

... just maybe everything isn't crystal clear at once.

$$k+2 - 4^k = P/k^2$$

$$42(0) \approx 5$$

$$\text{at 2 negative } \frac{42(0) \approx 5}{0^0 \times k^0 \times 10} \sum^{200}$$

$$25\% \quad x = \frac{e^{-2} L^2}{L^2}$$

$$(Significance of P/0:)$$

$$90 \quad \frac{P}{0} = \frac{23 \times 4^2}{4^2 \times 2/0}$$

$$2 \cdot 11 \rightarrow \int_0^{\infty} -42(k)^2 \cdot 8 \quad 0 \cdot 0 \cdot 0 \quad K_M = K! \left(\frac{x}{2}\right)$$

$$4 \cdot 11 \rightarrow \int_0^{\infty} -32(k)^2 \cdot 3 \quad 0 \cdot 0 \cdot 0 \quad \frac{R(0)}{R(0)} + \frac{1}{5} + \frac{20}{0^5} + \frac{1}{5^2} + \frac{245}{5^2 \cdot 4}$$

$$90 \sin = 42 \pi = \frac{23}{93}(k) s$$

42<sup>(0)</sup> and the cosine of less than 23<sup>(0)</sup>

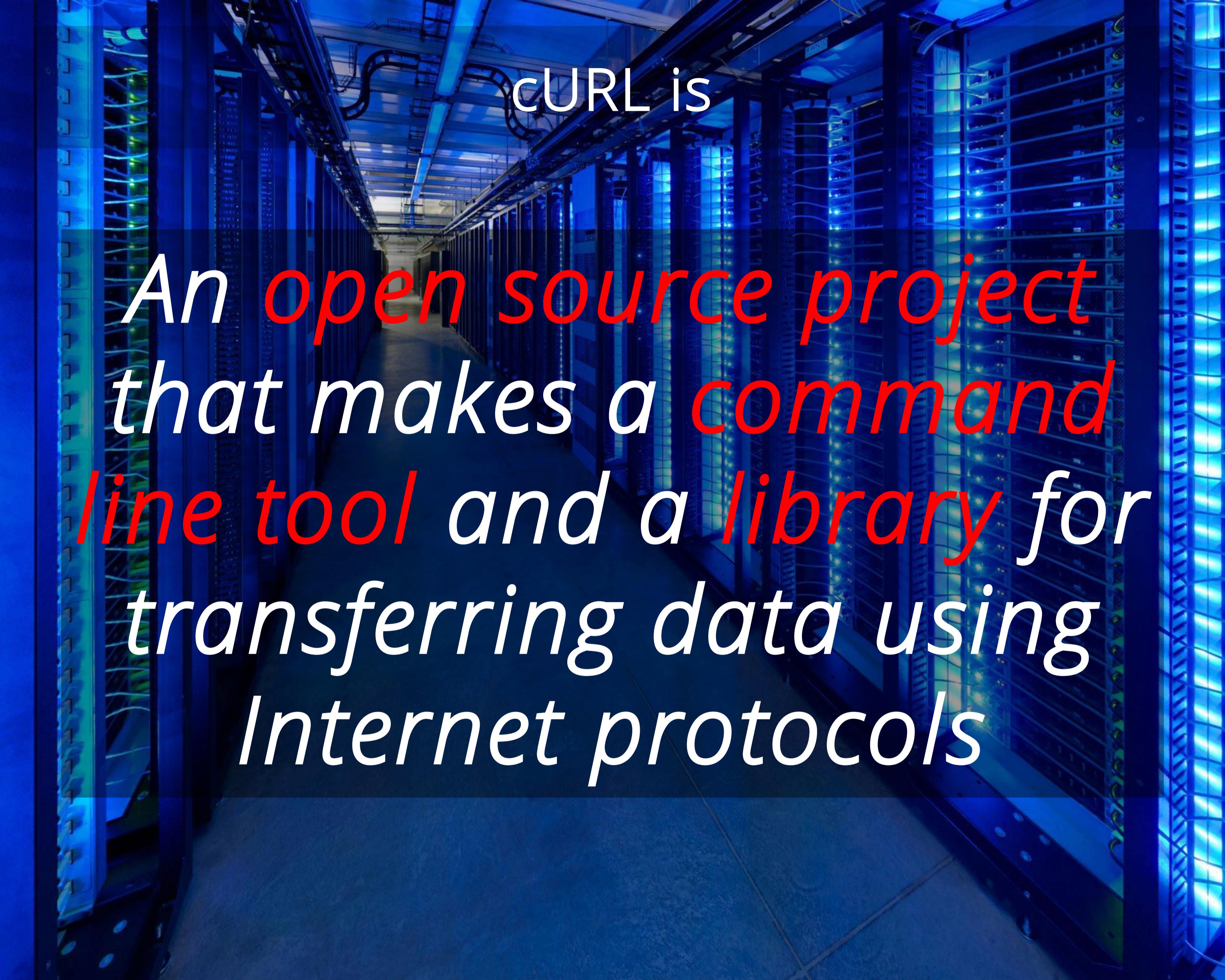
$$\text{factor is less than } 23$$

$$\times 3^0 / 42 \parallel = 23^0 \times 72(k) P^{-1/2}$$

$$00/42 = 33^0 \times 72$$

$$4 \quad 00/42 = 33^0 \times 72$$

&lt;math

The background of the slide is a photograph of a server room. The room is dimly lit, with the primary light source being the numerous server racks. These racks are filled with blue-lit components, likely hard drives or network cards, creating a pattern of vertical and horizontal blue lines. The floor is made of dark tiles, and the ceiling is visible in the background, showing some structural elements and more server racks.

cURL is

*An open source project  
that makes a command  
line tool and a library for  
transferring data using  
Internet protocols*

Let the story begin

# First there was nothing





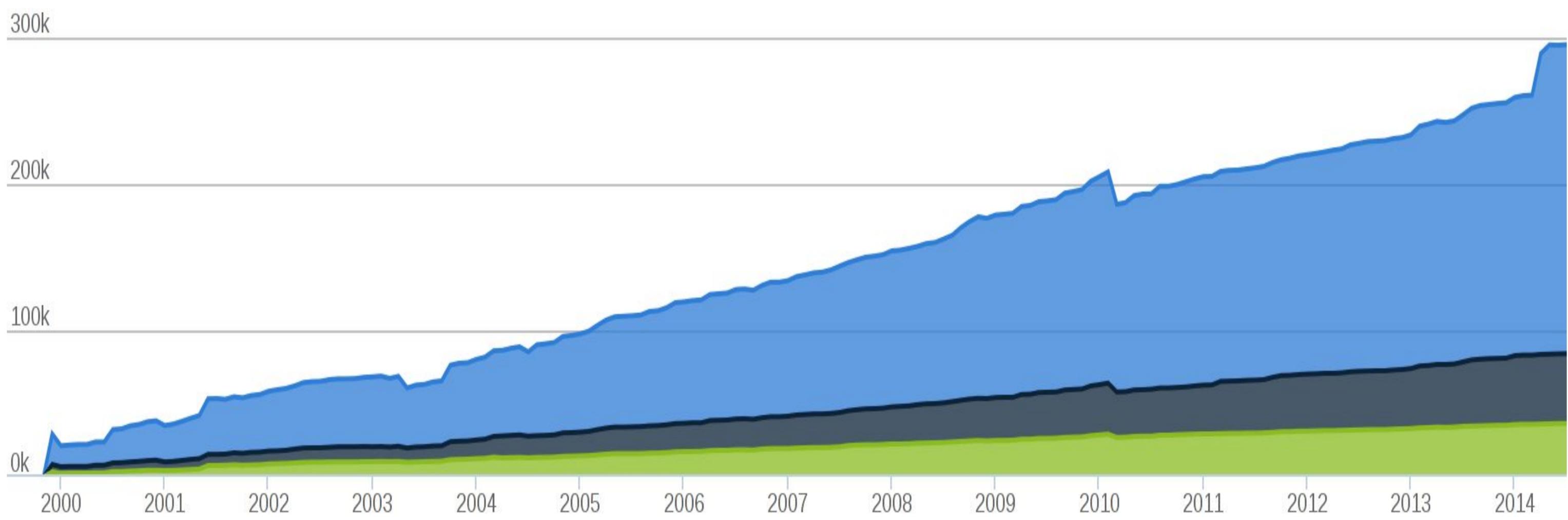
... became curl 1998

HTTP

Gopher

FTP

... and time passed...



2015

DICT, FILE, FTP, FTPS, Gopher, HTTP, HTTPS,  
IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S,  
RTMP, RTSP, SCP, SFTP, SMB, SMBS, SMTP,  
SMTPS, Telnet and TFTP

TLS certificates, HTTP POST, HTTP PUT, FTP  
uploading, HTTP form based upload, proxies,  
cookies, authentication (Basic, Digest, NTLM,  
Negotiate, Kerberos), HTTP/2, happy eyeballs,  
file transfer resume, proxy tunneling and much  
more

A high-angle photograph capturing a massive, dense crowd of people filling the frame. The individuals are packed closely together, creating a complex, textured pattern of heads and shoulders. The crowd is diverse in age and attire, with many wearing casual clothing like t-shirts, hoodies, and jeans. The overall impression is one of a large, global community.

one billion users

A high-angle photograph of a massive crowd of people filling the frame. The individuals are densely packed, creating a sea of heads and shoulders. The colors of their clothing are varied, with many wearing dark shirts and some in lighter colors like white, red, and blue. The overall texture is one of a large, diverse group of people.

a bunch of users

16 Software, 1C Company, ACCESS, Actuate, Adara Networks, AddLive, Adobe, Aditiva, Adknowledge, alaTEST, Altera, Altova, Ananse Productions, AOL, Apple, Archivas, ATX, AT&T, Autodesk, Avaya, BBC, Bietfuchs, Biicode, Bitcartel, BlackBerry, Blizzard, Bloglines.com, Blue Digits, Blue Security, BMW, Bosch, Broadcom, bwin, Candela Technologies, Canonical, Carestream Health, Cascade Data Systems, CatchFIRE Systems, CERN, CheckPoint, Chevrolet, Chronos, Cisco, Citrix, CLAAS Tractor SAS, Comcast, Contactor, CounterPath, Cybernetica, Datasphere, Datordax, Denon, DesignQuotes, Device Scape, Digium, EdelWeb, EFS Technology, Eiffel Software, Electronic Arts, Emsoft, Enigma Software, Euroling, Ergon Informatik, ESRI, etikett.de, www.expandtalk.se, Eye-Fi, E2E Technologies Ltd, F-Secure, Facebook, FalconView, Feitian Technologies, FriendFeed, FMWebschool, GeekDrop, GRIN, Groopex, Grooveshark, focuseek, Games Workshop, Garmin, GipsyMedia, Google, Haxx, HPC, Heynow Software, Hitachi, Honeywell, HP, Huawei, HTC, inSORS, IBM, ideelabor.ee, Idruna Software Inc, Id Software, Infomedia Business Systems Division, Informatica, Information Handling Services, Insignia, Instagram, Intel, Internet Security Systems, Intra2net AG, isee systems, Jajja Communications, Jawbone, JET, JLynx Software, Kajala Group Ltd., Kaleidescape, Karelia, Kaseya, kencast inc, Kerio Technologies, Kongsberg Spacetec, LassoSoft, lastpass, LG, LifeSize Software, Linden Lab, Machina Networks, Macromates, Macromedia, Magic TV, Matrix Science, Mandiant, MandrakeSoft, Marantz, Mazda, McAfee, MediaAnalys, Mellanox, Mercedes-Benz, Metaio, Micromuse Inc., Miniclip, Modio, MokaFive, Inc, Momento, Moodstocks, Motorola, Mozilla, Music FX Live, Nagarsoft, Neptune Labs, Nest, Netflix, Netgear, Netiq, Network Mail, Neuros, Nintendo, NoDesign, Nortel, Office2office Plc, OKTET Labs Ltd, One Laptop Per Child, Onkyo, On Technology, OpenLogic, opsmate, Optimus, Oracle, Outrider, Palm, Panasonic, Pandigital, Parrot, Passiv Systems, Pelco, Philips, Pioneer, Plogue, Pocket Gems, Polaroid Corporation, Polycom, Pure Storage, Quest, QVD, QNX, RBS, Research in Motion, Retarus Network Services GmbH, Riverbed, ROBLOX, Rockstar Games, Rolltech, Inc, RSA Security Inc, RSSS, Samsung, SanDisk, SAP, SAS Institute, SEB, Sharp, Siemens, Silicon Landmark, Sjphone, Slingbox, SmithMicro, Sony, Sophos, Source Remoting, Splunk, Spotify, Steambird, Sun, SurfEasy Inc, Swisscom, Symantec, System Garden, Tango, tasvideos, Tellabs, Telstra, Telvue, Thumbtack, Tilgin, Tomtom, ToolAware, Toshiba, Trend Micro, Tribalmedia, Trion Worlds, Tiempo de Espera, Unisys, UniPlot, Unity3d, ustream, Valve, VETport, Vivisimo, Vmware, Voddler, Volition Inc, Vu, Wump Research, Xilinx, XonaSoftware, Yahoo, Yamaha, Yubico, Zimbra, Zixcorp, Zonar Systems, Zyxel, Z2,

Adobe, Altera, AOL, Apple, AT&T, BBC,  
Blackberry, BMW, Bosch, Broadcom,  
Chevrolet, Cisco, Comcast, Facebook,  
Google, Hitachi, Honeywell, HP, Huawei,  
HTC, IBM, Intel, LG, Mazda, Mercedes-  
Benz, Motorola, Netflix, Nintendo,  
Oracle, Panasonic, Philips, Pioneer, RBS,  
Samsung, SanDisk, SAP, SAS Institute,  
SEB, Sharp, Siemens, Sony, Spotify, Sun,  
Swisscom, Tomtom, Toshiba, Vmware,  
Xilinx, Yahoo, Yamaha

# In all the things!

Mac OS X

TVs

Iphones and Ipads

Other phones

Linux

Games

Version control  
systems

Cars

PHP sites

Set-top boxes

Audio equipment

Bluray players

Printers

Firefox crash  
reporter

Sites: Facebook,  
Yahoo, ...

Your next device

*Everyone here likely has a  
device using libcurl.  
Probably even more than one!*



# Why use curl?

Internet doesn't follow  
specs  
Open source  
MIT licensed  
Simple and **stable** API  
Yet **powerful** API  
HTTP library when libwww  
was the only choice  
**C library** is still most  
portable

**Bindings** for every  
language  
Decent **documentation**  
Decent **stability**  
Supports all the protocols  
**Fast**  
Allows disabling parts for  
footprint shaving  
Many **TLS backends**  
Small devices still like C



What is success ?

Is success important?

Whose success?



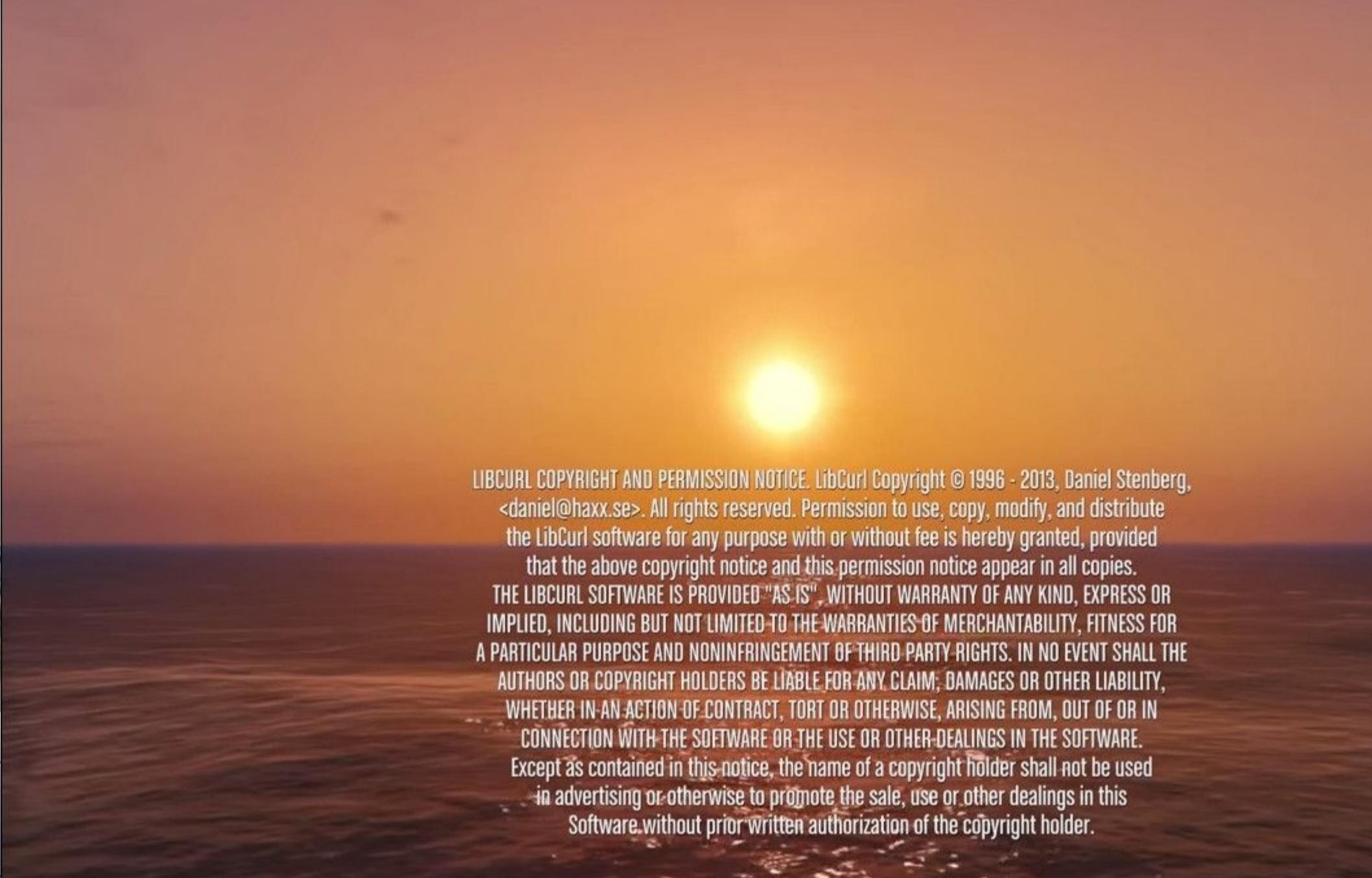
Daniel Stenberg ( library )

Copyright © 1996 - 2011, Daniel Stenberg,  
<[daniel@haxx.se](mailto:daniel@haxx.se)>.

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How is all this  
accomplished?

# the project

curl and libcurl

Transfer data using internet application  
protocols

Stable products

Stable API

Maximum portability

MIT

A group of children are playing a game of tug-of-war on a grassy field. They are pulling on a rope with great effort, their bodies leaning back. The children are wearing casual clothing like t-shirts, shorts, and jeans. The background shows more children and a clear sky.

Contributors

1300 in total  
30-40 per release

Increasing  
Small core team  
volunteers

A wide-angle photograph of a theater interior during a performance. The seating consists of multiple levels of red upholstered theater seats, filled with an audience of diverse ages. The perspective is from an upper level, looking down at the theater floor where stage equipment like lighting rigs and pipes are visible. The lighting is focused on the audience, creating a warm atmosphere.

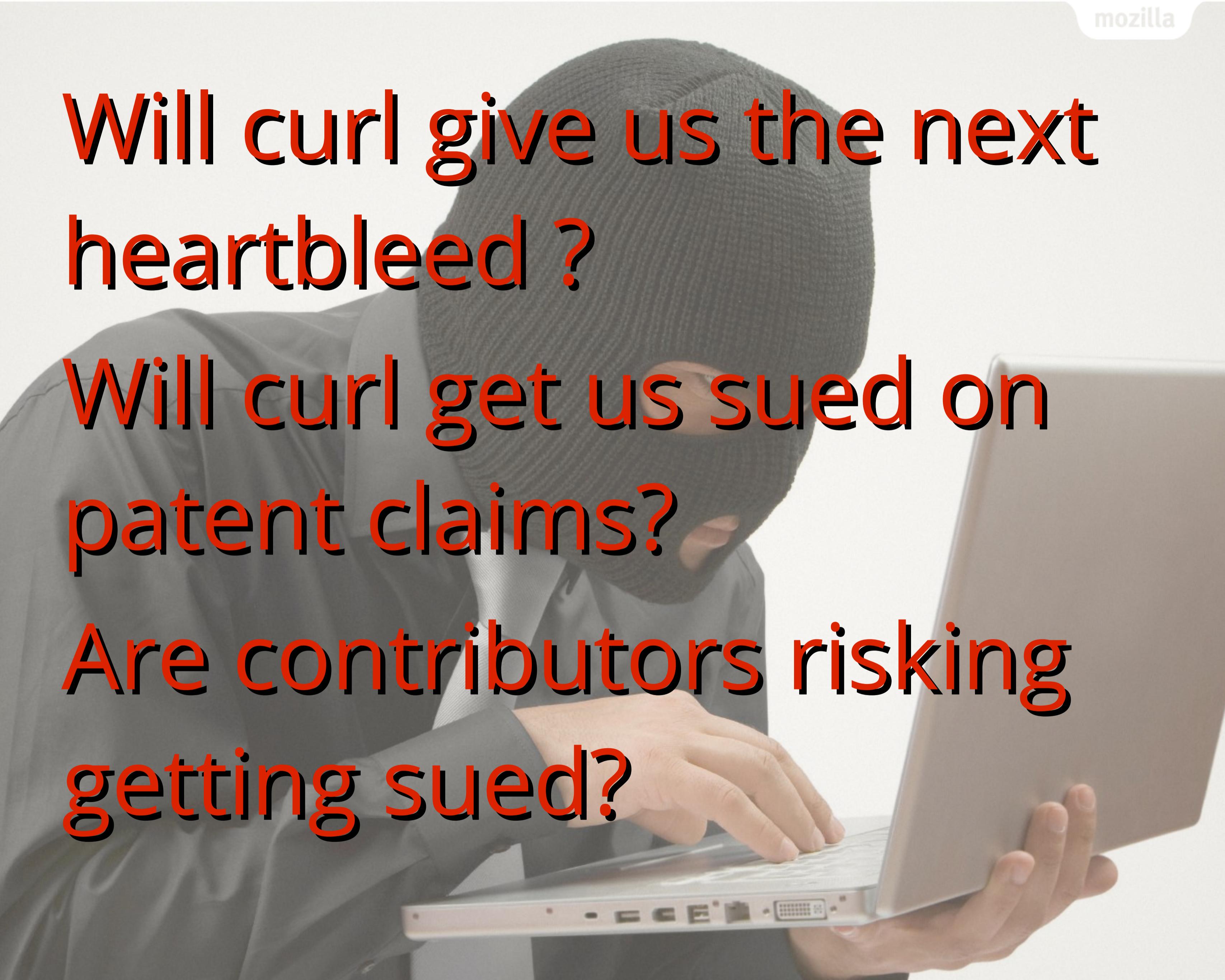
Everything is in  
the public

A photograph of a desk setup. A computer monitor sits on a wooden desk, displaying a blue screen. In front of the monitor is a black keyboard and a black mouse on a mouse pad. To the left of the desk, a black office chair is partially visible. The desk is cluttered with various items, including a cardboard box with shipping labels, a small yellow sticky note, and some cables. The background shows a wall with a small painting of trees and a string of lights.

on github  
a few have push  
rights

A photograph of a woman sitting at a large wooden desk, completely overwhelmed by a massive, sprawling pile of papers. She is looking upwards and to the right, appearing stressed or lost. The desk is covered in papers, and a telephone and a lamp are visible among the clutter. The background shows a bookshelf filled with books.

**mailing lists**

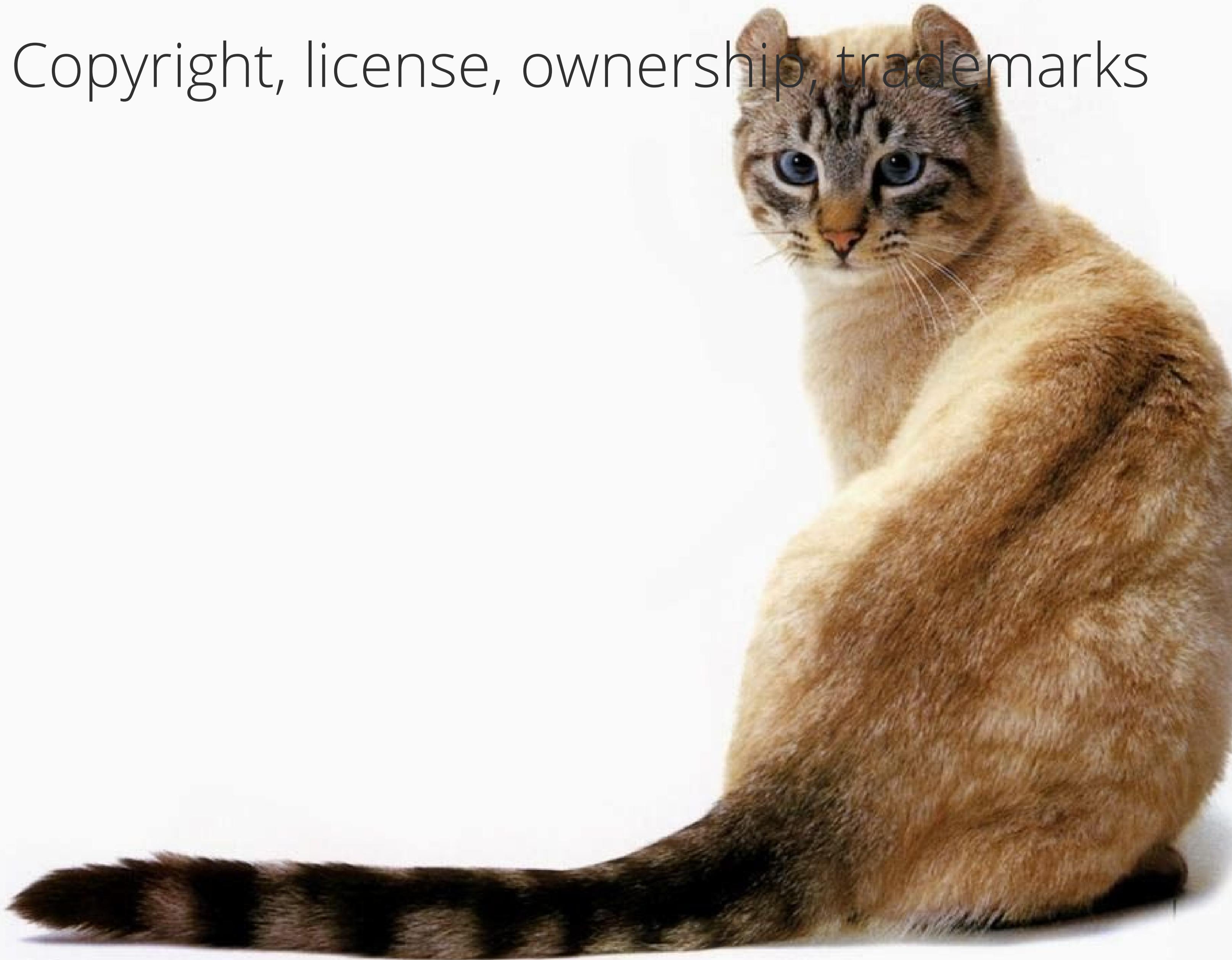
A grayscale photograph of a person from the waist up. They are wearing a dark, ribbed hoodie and a dark balaclava. Their hands are visible, one resting on the keyboard of an open laptop and the other near the trackpad. The background is plain white.

**Will curl give us the next  
heartbleed ?**

**Will curl get us sued on  
patent claims?**

**Are contributors risking  
getting sued?**

Copyright, license, ownership, trademarks



# Copyright, license, ownership, trademarks

Daniel owns most copyrights

Larger contributions may get its own copyright claim

We assume donors have the right to hand over their code submissions

The license is fixed and will remain forever

We have no trademarks but there is an American trademark registered for “curl”

Individual contributors to the project contribute on their own free will

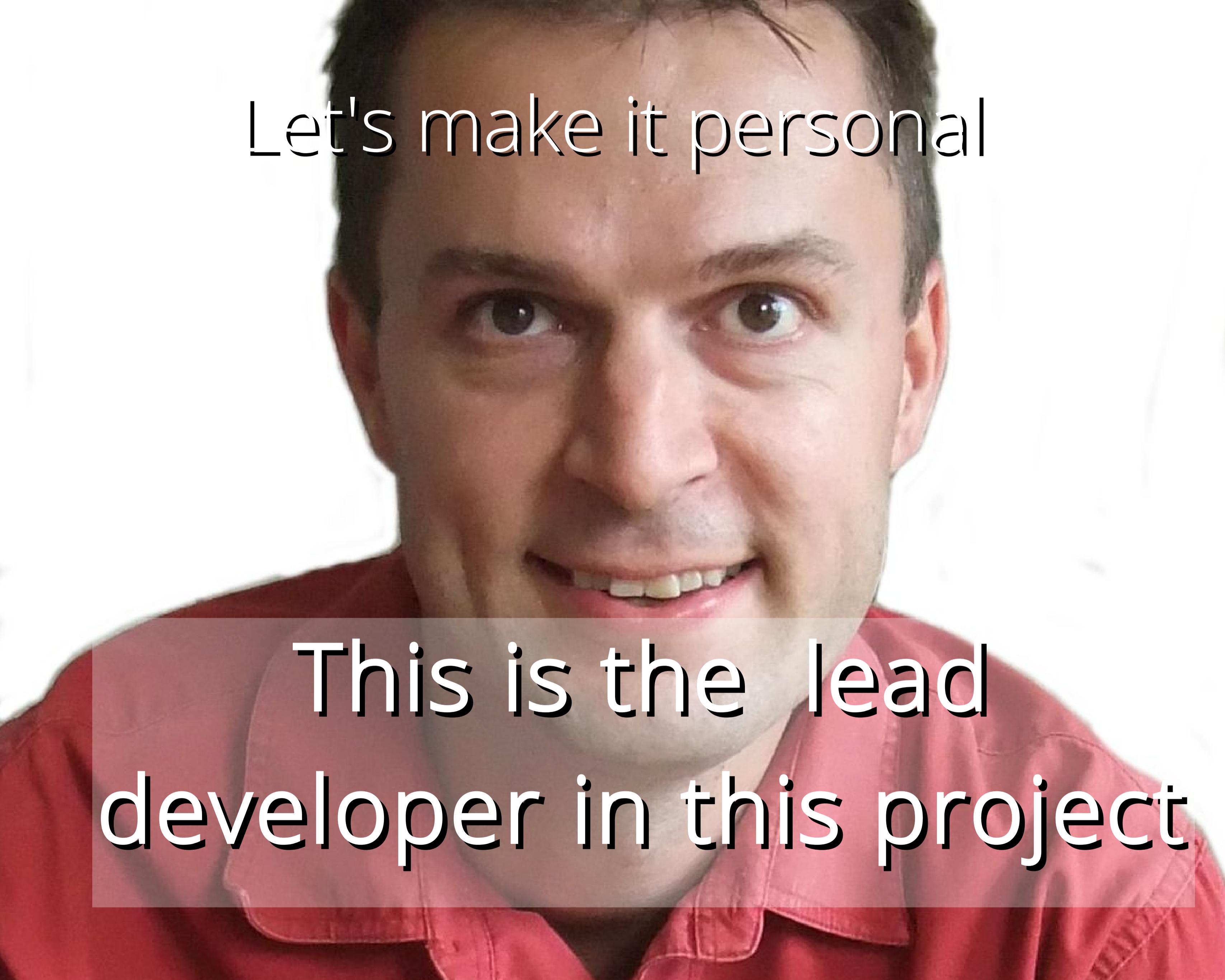
# Who pays



Spare time hackers

Company paid contributors

Company paid feature development



Let's make it personal

This is the lead developer in this project

# This is my primary hobby

On average, I work two hours on curl per day

Every day of the week, every week of the year

Since 1998

Part time paid by Mozilla since 2014

12,000 spare time hours and counting

24,000 emails sent

15,000 commits

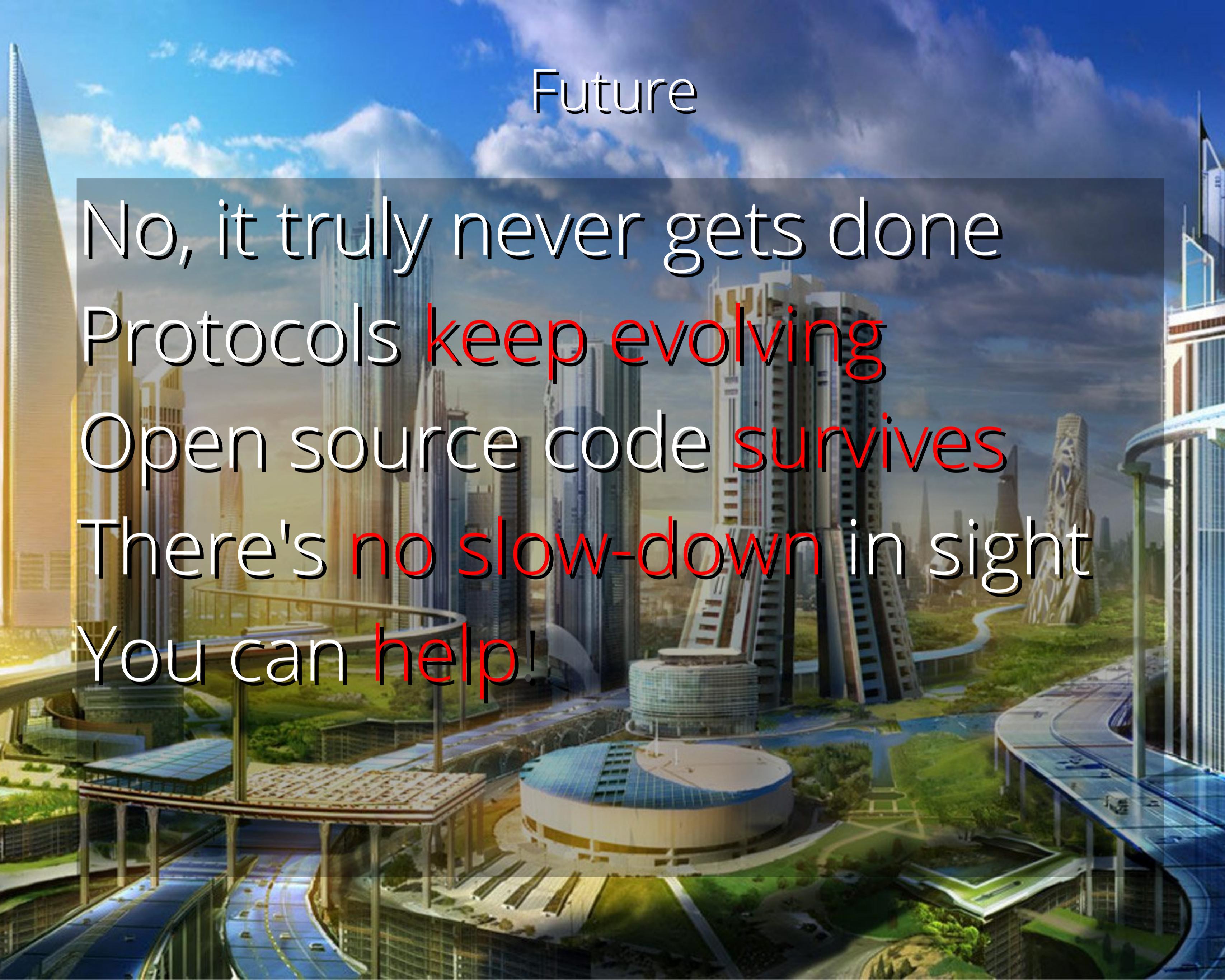
# Why I do it?

I'm enjoying creating something that is  
appreciated by others. Many others.

I want to make curl as good as  
possible

Everyone needs a hobby

It's the most fun I can  
imagine

A vibrant, futuristic cityscape serves as the background. In the foreground, a large, semi-transparent black rectangular box spans most of the width of the slide. The city features numerous skyscrapers of various heights and designs, some with reflective glass facades and others with more organic, rounded shapes. A network of elevated roads and highways with sleek, white flying cars is visible throughout the scene. The sky above is a mix of bright blue and fluffy white clouds, with darker, more dramatic clouds on the right side.

Future

No, it truly never gets done

Protocols **keep evolving**

Open source code **survives**

There's no slow-down in sight

You can **help!**

Thank you!



<http://curl.haxx.se/>



Doing good is part of our code

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