Software

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https://berthub.eu/les/

PowerDNS: 1999 - 2020


NLUUG
Open systemen
Open standaarden
NLUUG
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Open systemen
Open standaarden

Toetsingscommissie Inzet Bevoegdheden

```cpp
#include <vector>
#include <fmt/ranges.h>

// (C) 2023 AHU Holding BV

int main() {
  std::vector<int> v = {1, 2, 3};

  // print contents
  fmt::print("{}\n", v);
}
```

```
ahu@brul2:~/git/code-tour$ ./hello
[1, 2, 3]
```

HI	*LO-NIBBLE*															
	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-	BRK impl	ORA X,ind				ORA zpg	ASL zpg		PHP impl	ORA #	ASL A			ORA abs	ASL abs	
1-	BPL rel	ORA ind,Y				ORA zpg,X	ASL zpg,X		CLC impl	ORA abs,Y				ORA abs,X	ASL abs,X	
2-	JSR abs	AND X,ind			BIT zpg	AND zpg	ROL zpg		PLP impl	AND #	ROL A		BIT abs	AND abs	ROL abs	
3-	BMI rel	AND ind,Y				AND zpg,X	ROL zpg,X		SEC impl	AND abs,Y				AND abs,X	ROL abs,X	
4-	RTI impl	EOR X,ind				EOR zpg	LSR zpg		PHA impl	EOR #	LSR A		JMP abs	EOR abs	LSR abs	
5-	BVC rel	EOR ind,Y				EOR zpg,X	LSR zpg,X		CLI impl	EOR abs,Y				EOR abs,X	LSR abs,X	
6-	RTS impl	ADC X,ind				ADC zpg	ROR zpg		PLA impl	ADC #	ROR A		JMP ind	ADC abs	ROR abs	
7-	BVS rel	ADC ind,Y				ADC zpg,X	ROR zpg,X		SEI impl	ADC abs,Y				ADC abs,X	ROR abs,X	
8-		STA X,ind			STY zpg	STA zpg	STX zpg		DEY impl		TXA impl		STY abs	STA abs	STX abs	
9-	BCC rel	STA ind,Y			STY zpg,X	STA zpg,X	STX zpg,Y		TYA impl	STA abs,Y	TXS impl			STA abs,X		
A-	LDY #	LDA X,ind	LDX #		LDY zpg	LDA zpg	LDX zpg		TAY impl	LDA #	TAX impl		LDY abs	LDA abs	LDX abs	
B-	BCS rel	LDA ind,Y			LDY zpg,X	LDA zpg,X	LDX zpg,Y		CLV impl	LDA abs,Y	TSX impl		LDY abs,X	LDA abs,X	LDX abs,Y	
C-	CPY #	CMP X,ind			CPY zpg	CMP zpg	DEC zpg		INY impl	CMP #	DEX impl		CPY abs	CMP abs	DEC abs	
D-	BNE rel	CMP ind,Y				CMP zpg,X	DEC zpg,X		CLD impl	CMP abs,Y				CMP abs,X	DEC abs,X	
E-	CPX #	SBC X,ind			CPX zpg	SBC zpg	INC zpg		INX impl	SBC #	NOP impl		CPX abs	SBC abs	INC abs	
F-	BEQ rel	SBC ind,Y				SBC zpg,X	INC zpg,X		SED impl	SBC abs,Y				SBC abs,X	INC abs,X	

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}
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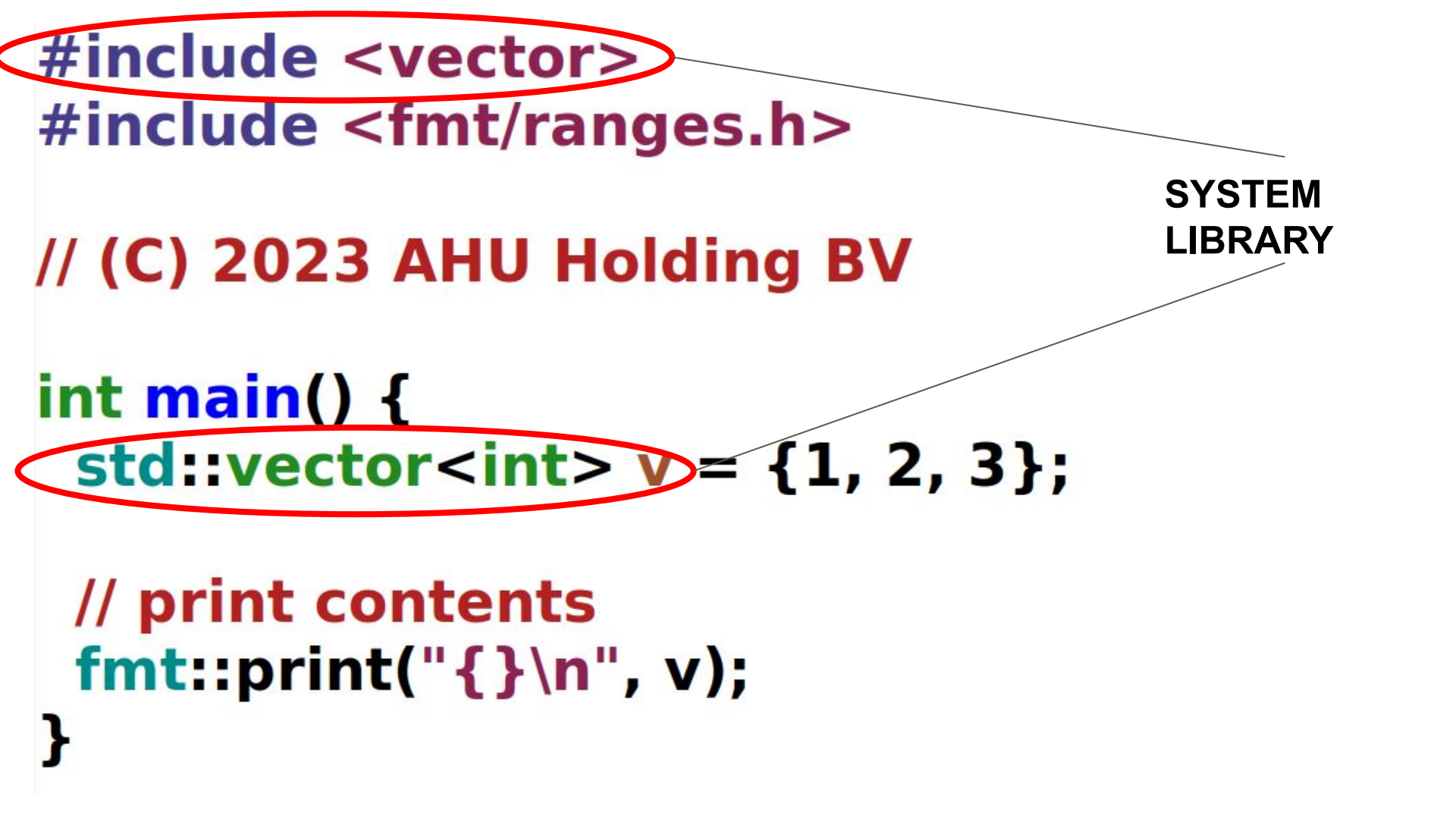
COMMENTS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}
SYSTEM
LIBRARY

```cpp
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```

Third party library

```cpp
#include <vector>
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  // print contents
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}
```

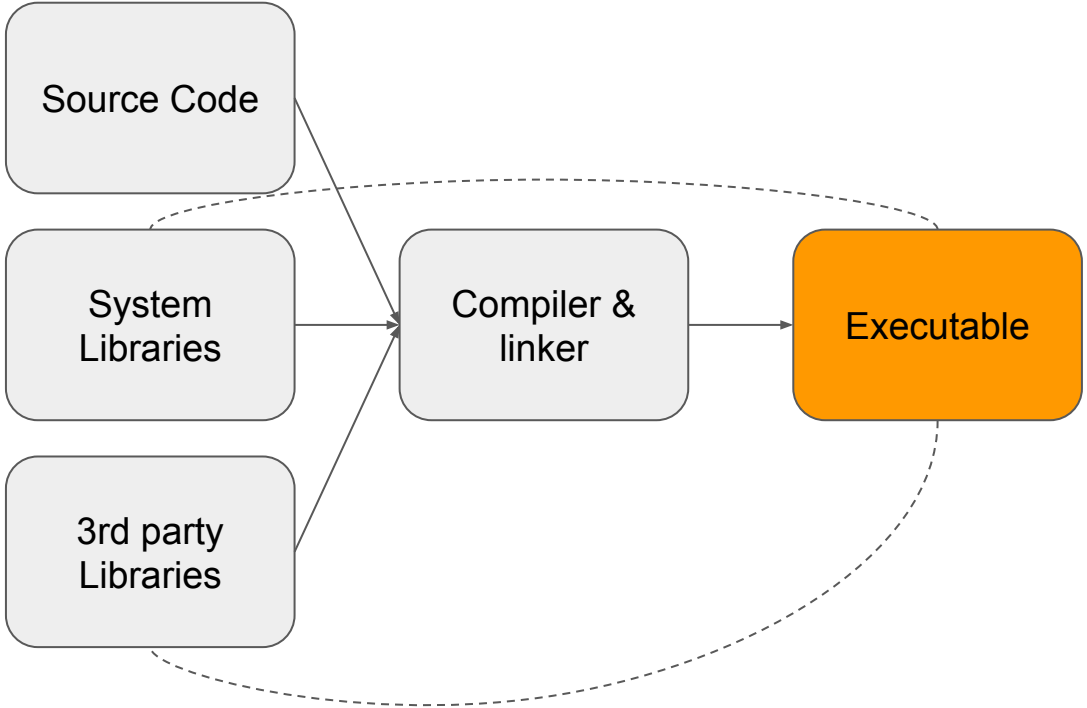
Thing that just has to be that way

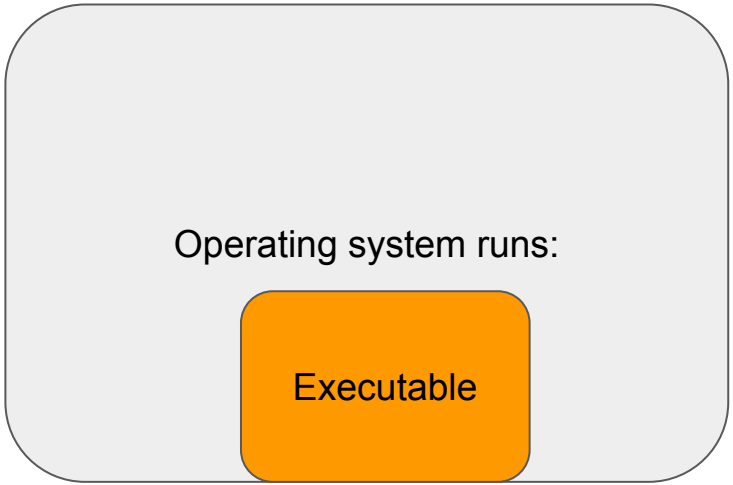
Elements of source code

- **Comments**: no influence over what the code DOES (usually)
  - May include attempts at legal statements & disclaimers
  - Suitable for forensics: where did this code come from?
- References to **system libraries / components (“2nd party”)**
- References to **third party libraries**
- **Ritualistic invocations, technical** details (“main()”)
- **Actual code instructions** for this computer program

Access to source code means **nothing**. Is like having a copy of a book. No rights are conferred.

Source code is not as great as people think. Not the crown jewels.


Source Code
System Libraries
3rd party Libraries
Compiler & linker
Executable


Operating system runs:
Executable

Dynamic libraries: kernel interface, C++, compiler internals, C library, math library, dynamic system loader

```
ahu@brul2:~/git/code-tour$ ldd ./hello
        linux-vdso.so.1 (0x00007ffc6b981000)
        libstdc++.so.6 => /lib/x86_64-linux-gnu/libstdc++.so.6 (0x00007f9018a00000)
        libgcc_s.so.1 => /lib/x86_64-linux-gnu/libgcc_s.so.1 (0x00007f9018ca8000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f9018600000)
        libm.so.6 => /lib/x86_64-linux-gnu/libm.so.6 (0x00007f9018919000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f9018d0f000)
```

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Static library: fmt formatting library

```
ahu@brul2:~/git/code-tour/ext$ ls fmt-10.1.1/src/fmt.cc fmt-10.1.1/src/os.cc
fmt-10.1.1/src/fmt.cc  fmt-10.1.1/src/os.cc
```

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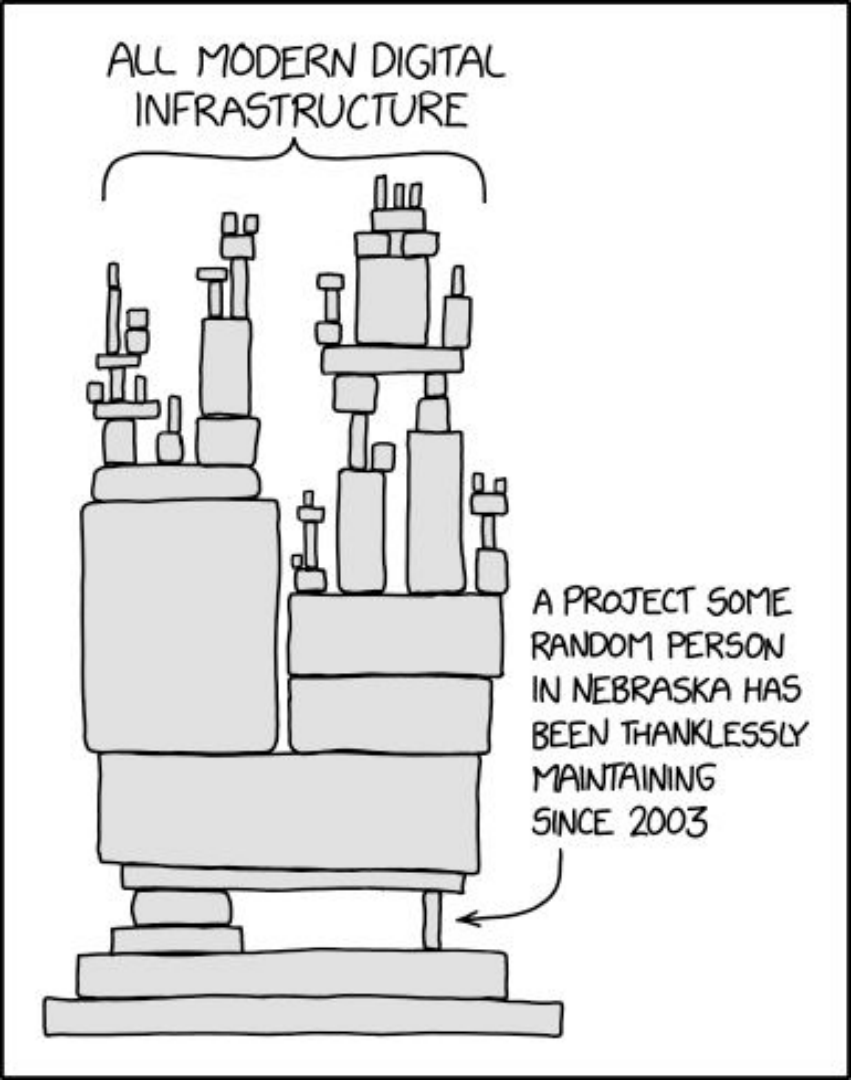
These libraries are all ***dependencies***. Each "dep" requires a ***license*** that allows you to ship an executable.

If you ever need to do battle over impact of static or dynamic linking or **plugins**: **hire the best**.
(or give up)



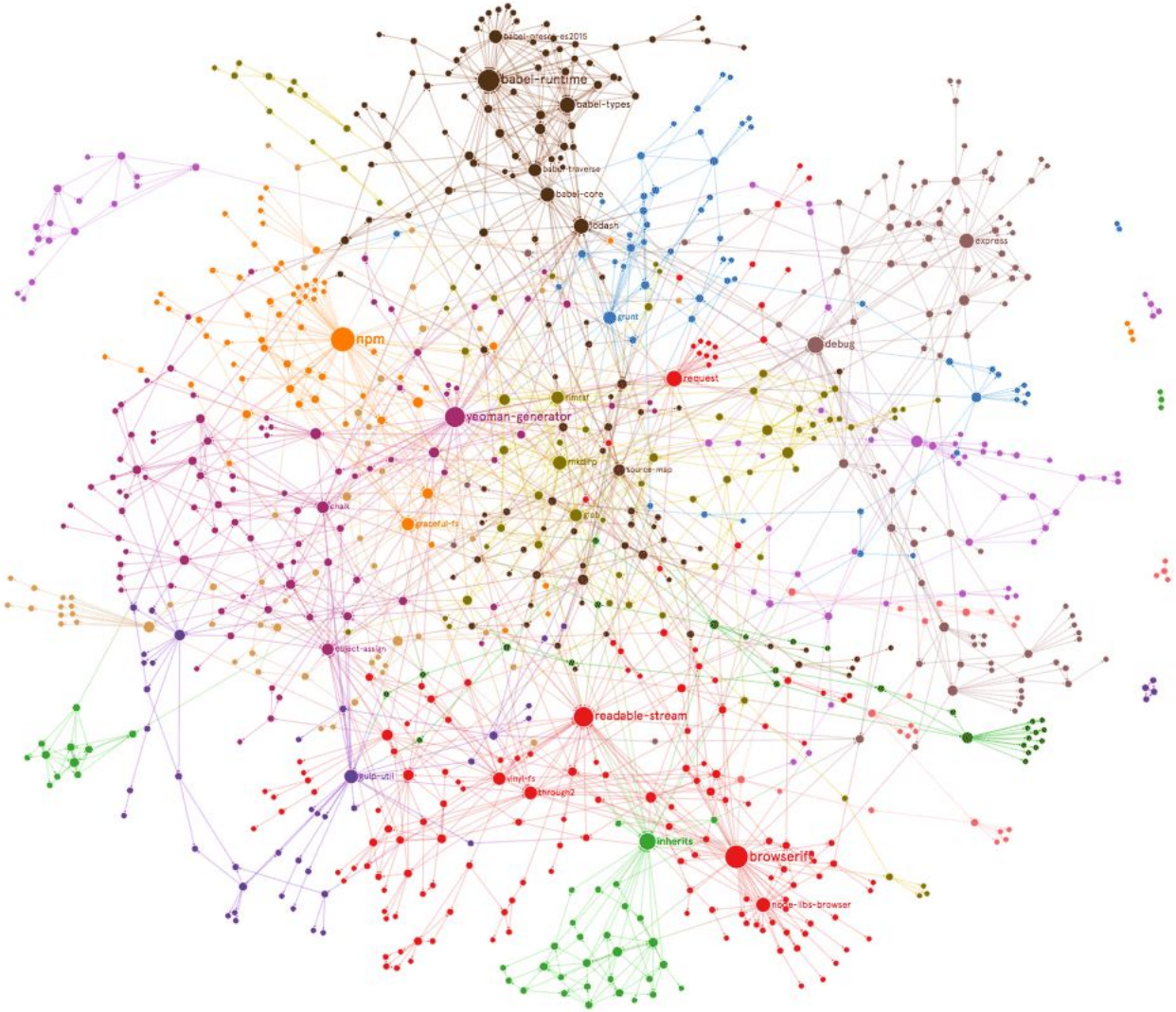
On an iPhone, go to:

- Settings
- General
- Legal & Regulatory
- Legal Notices.

Try to scroll to the end!

1000s of dependencies!

Changes every day also!



Things to watch out for

- No visibility in what is being shipped
- You are on the hook legally though - need explicit licenses
- Who knows if dependencies own the code they ship
- **Effectively you can’t keep track**
- Of specific note for M&A

“The Skype **founders** apparently **retained** the service's peer-to-peer sharing technology when they sold to eBay for $2.6bn in 2005. (Which, of course, begs the question why eBay would pay all that money without ensuring **they own the entire platform)**.”

NPM ERR!

How one programmer broke the internet by deleting a tiny piece of code

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Thing that just has to be that way

Google LLC v. Oracle America, Inc.

From Wikipedia, the free encyclopedia

Google LLC v. Oracle America, Inc., 593 U.S. ___ (2021),[1] was a U.S. Supreme Court decision related to the nature of computer code and copyright law. The dispute centered on the use of parts of the Java programming language's application programming interfaces (APIs) and about 11,000 lines of source code, which are owned by Oracle (through subsidiary, Oracle America, Inc., originating from Sun Microsystems), within early versions of the Android operating system by Google. Google has since transitioned Android to a copyright-unburdened engine without the source code, and has admitted to using the APIs but claimed this was within fair use.

Oracle initiated the suit arguing that the APIs were copyrightable, seeking US$8.8 billion in damages from Google's sales and licensing of the earlier infringing versions of Android. While two District Court-level jury trials found in favor of Google, the Federal Circuit court reversed both decisions, holding that APIs are copyrightable and Google's use does not fall under fair use. Google successfully petitioned to the Supreme Court to hear the case in the 2019 term, focusing on the copyrightability of APIs and subsequent fair use; the case was delayed to the 2020 term due to the COVID-19 pandemic. In April 2021, the Supreme Court ruled in a 6–2 decision that Google's use of the Java APIs fell within the four factors of fair use, bypassing the question on the copyrightability of the APIs. The decision reversed the Federal Circuit ruling and remanded the case for further review.

The case has been of significant interest within the tech and software industries, as numerous computer programs and software libraries, particularly in open source, are developed by recreating the

Google LLC v. Oracle America, Inc.	
Supreme Court of the United States	
Argued October 7, 2020 **Decided April 5, 2021**	
Full case name	*Google LLC v. Oracle America, Inc. XD*
Docket no.	18-956
Citations	593 U.S. ___ (*more*) 141 S. Ct. 1183 209 L. Ed. 2d 311
Argument	Oral argument
Decision	Opinion
Case history	

Further things to watch out for

- Upcoming: EU Cyber Resilience Act, Product Liability Directive
- Put you up the hook for whatever you ship
  - Including dependencies!
- Software becomes a “real product”
  - 

Software

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https://berthub.eu/les/