Java Third Party Libraries

Impact on Java Applications

Aurelio Garcia-Ribeyro

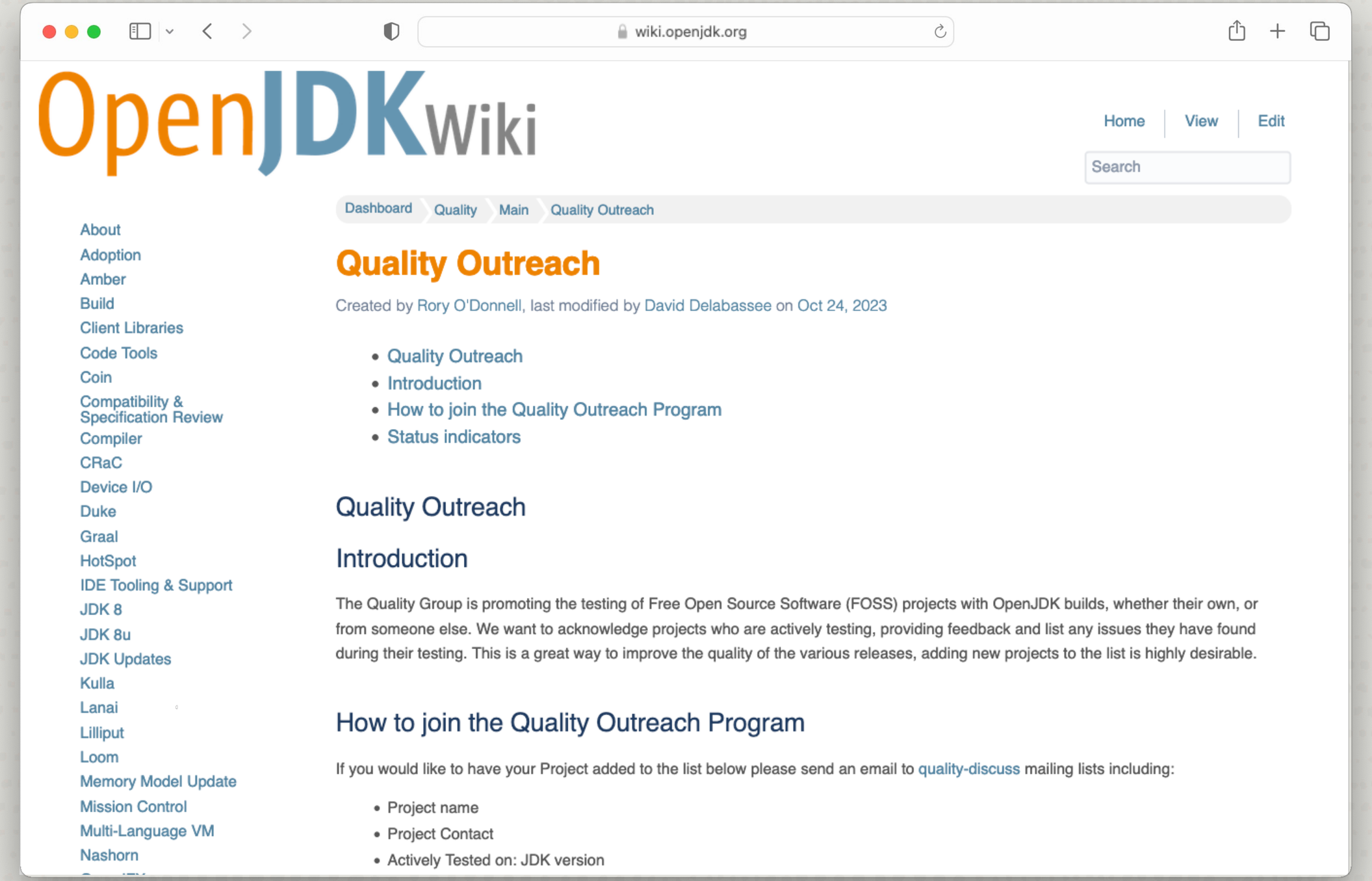
Java Platform Group - Oracle

JUnit 5

JAXB

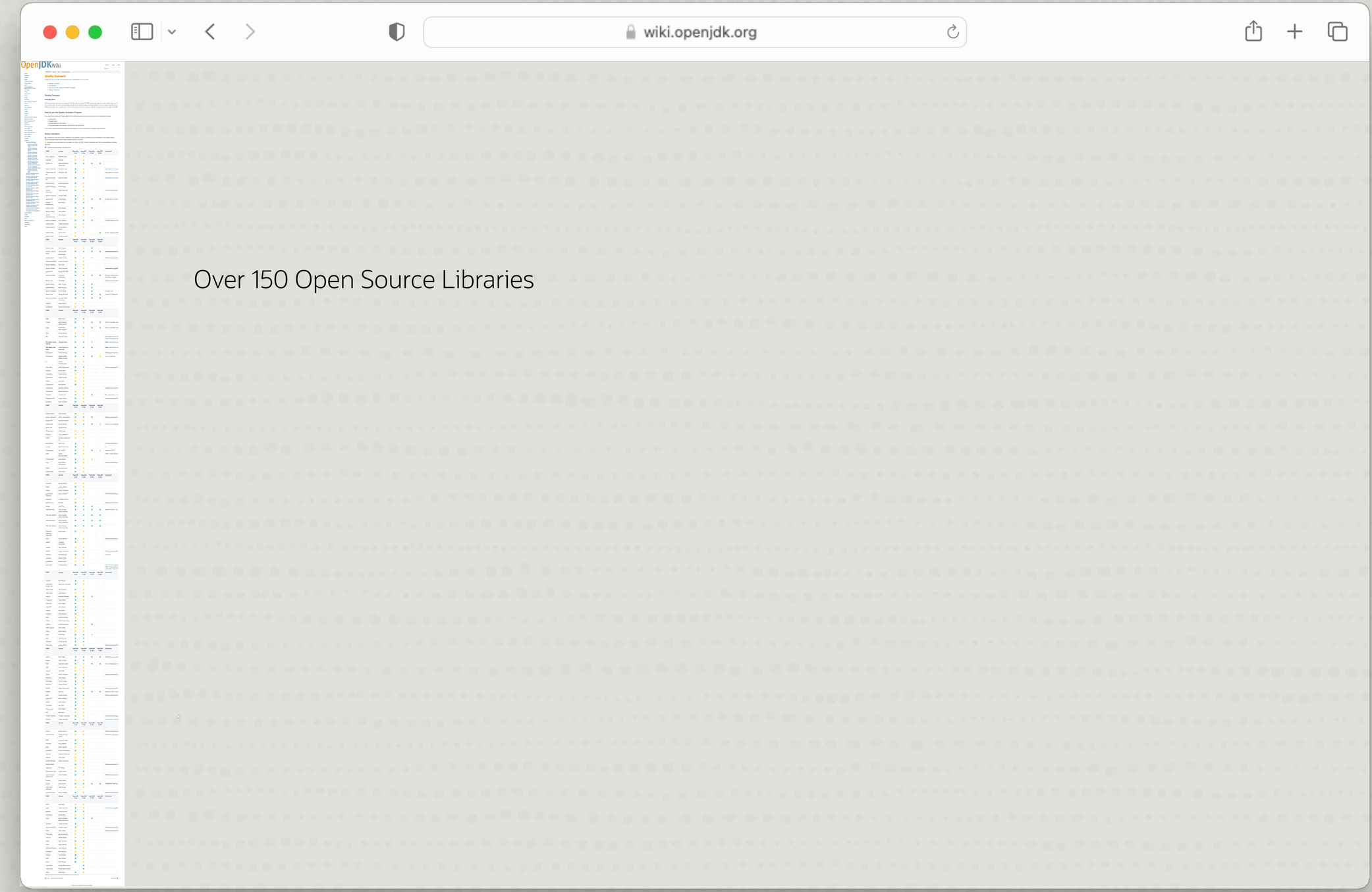
jackson

ASM



★ - Indicates will start testing in the near future

FOSS	Contact	OpenJDK 11.0.6	OpenJDK 17 GA	OpenJDK 21 GA	OpenJDK 22 EA	Comments
Akka, Lightbend	Patrik Nordwall	★	★			
Angel-ML	Brucetao	★	★			
Apache Ant	Stefan Bodewig & Jaikiran Pai	★	★	★	★	
Apache Aries CDI	Raymond Auge	★	★			https://github.com/apacl
Apache Aries JAX-RS	Raymond Auge	★	★			https://github.com/apacl
Apache Aries Spi Fly	Raymond Auge	★	★			https://github.com/apacl
Apache Camel	Andrea Cosentino	★	★			
Apache Chemistry	Florian Muller	★	★			
Apache CloudStack	Gabriel Bräscher	★	★			#WorksLikeHeavenOnJ
Apache Commons	Benedikt Ritter	★	★			
Apache CXF	Andriy Redko	★	★	★	★	Oct.23: JDK 21 is fully s
Apache DataSketches	Lee Rhodes	★	★			
Apache Derby	Rick Hillegas	★	★	★		



Over 150 Open Source Libraries

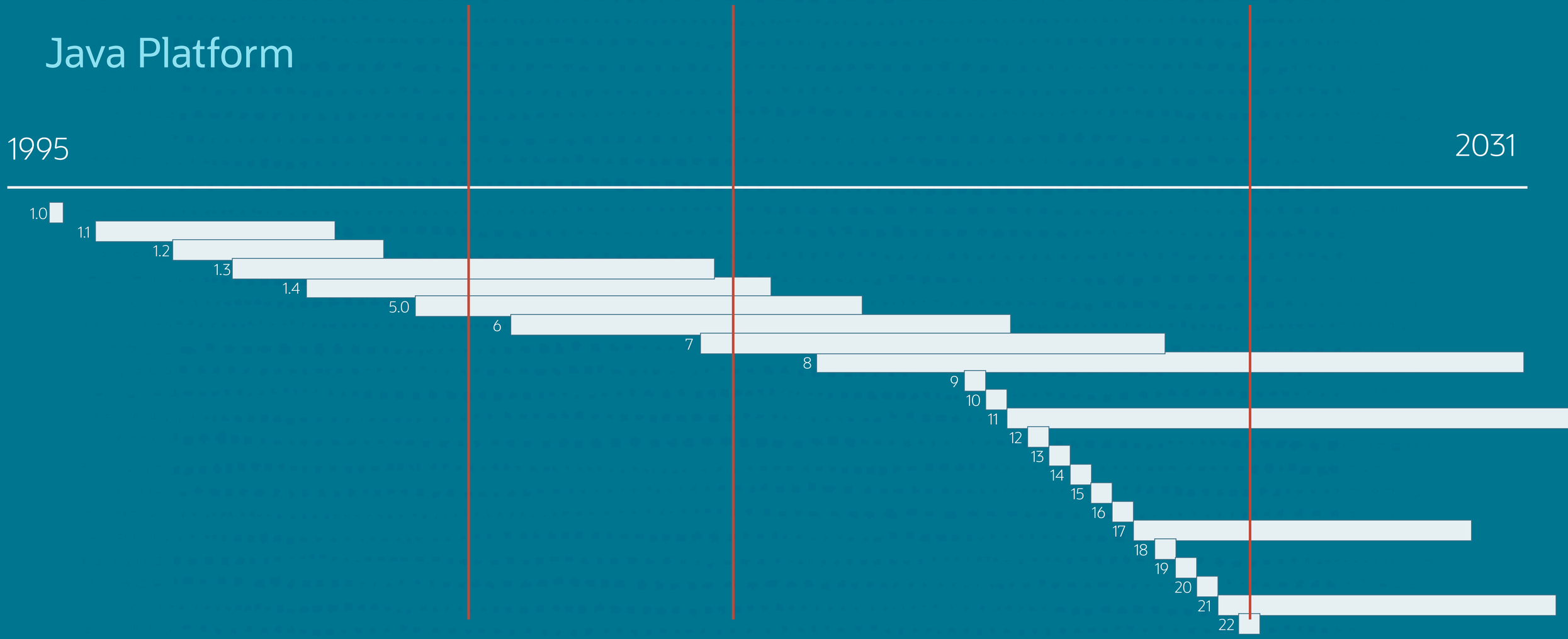
But so far this has been only about adopting new JDK versions

We also need to look at the support timelines….

"Multiple release trains" model is well established

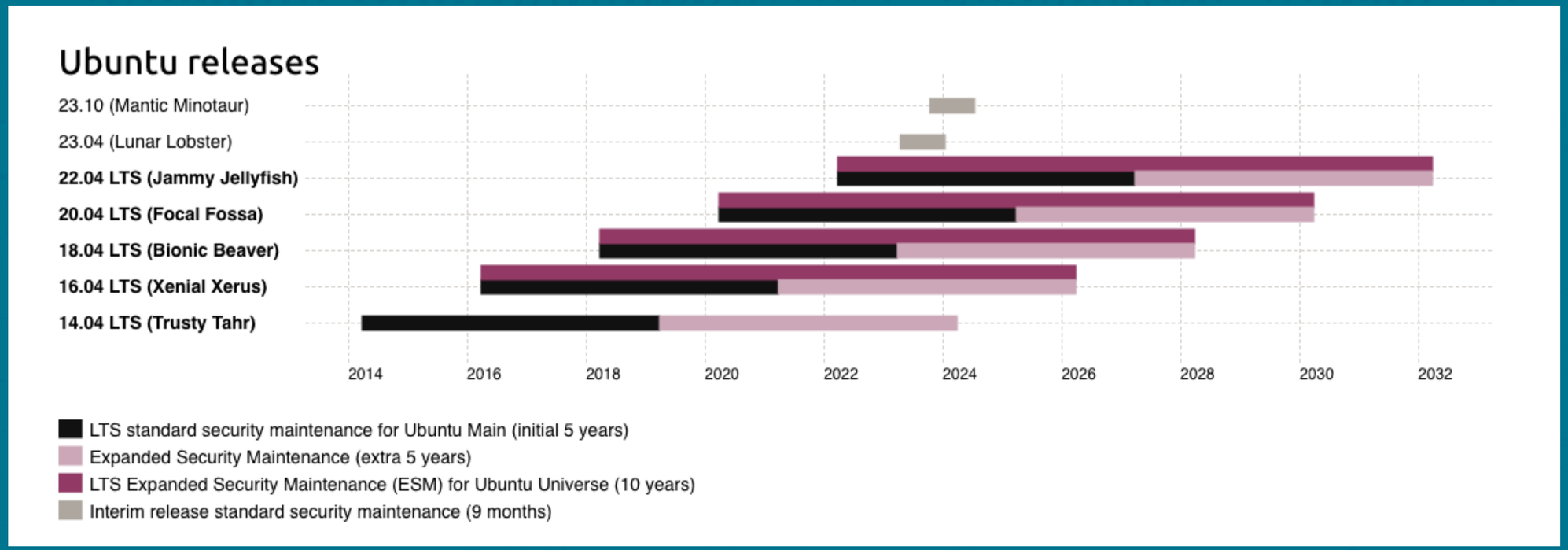
Support Timelines

Java Platform



Support Timelines

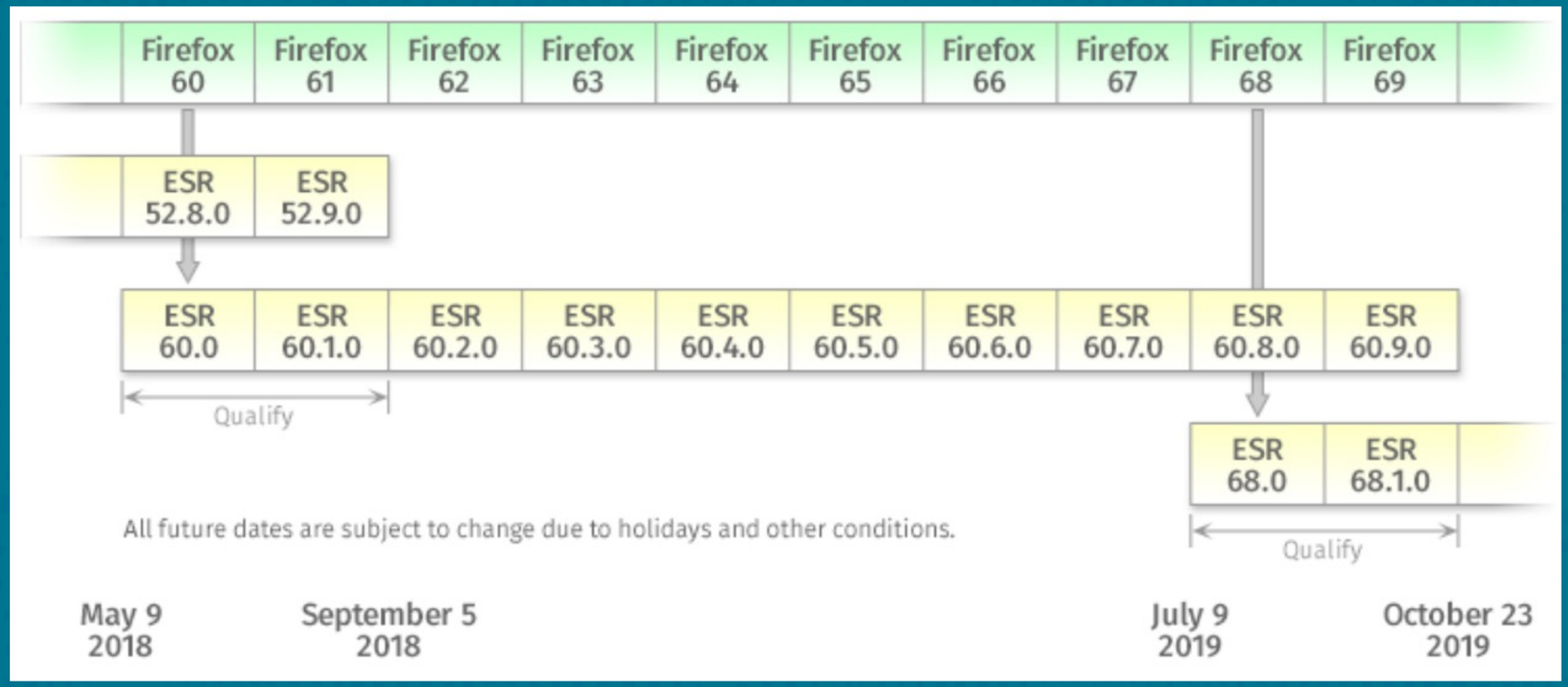
Ubuntu



https://ubuntu.com/about/release-cycle as of 2024/04/18

Support Timelines

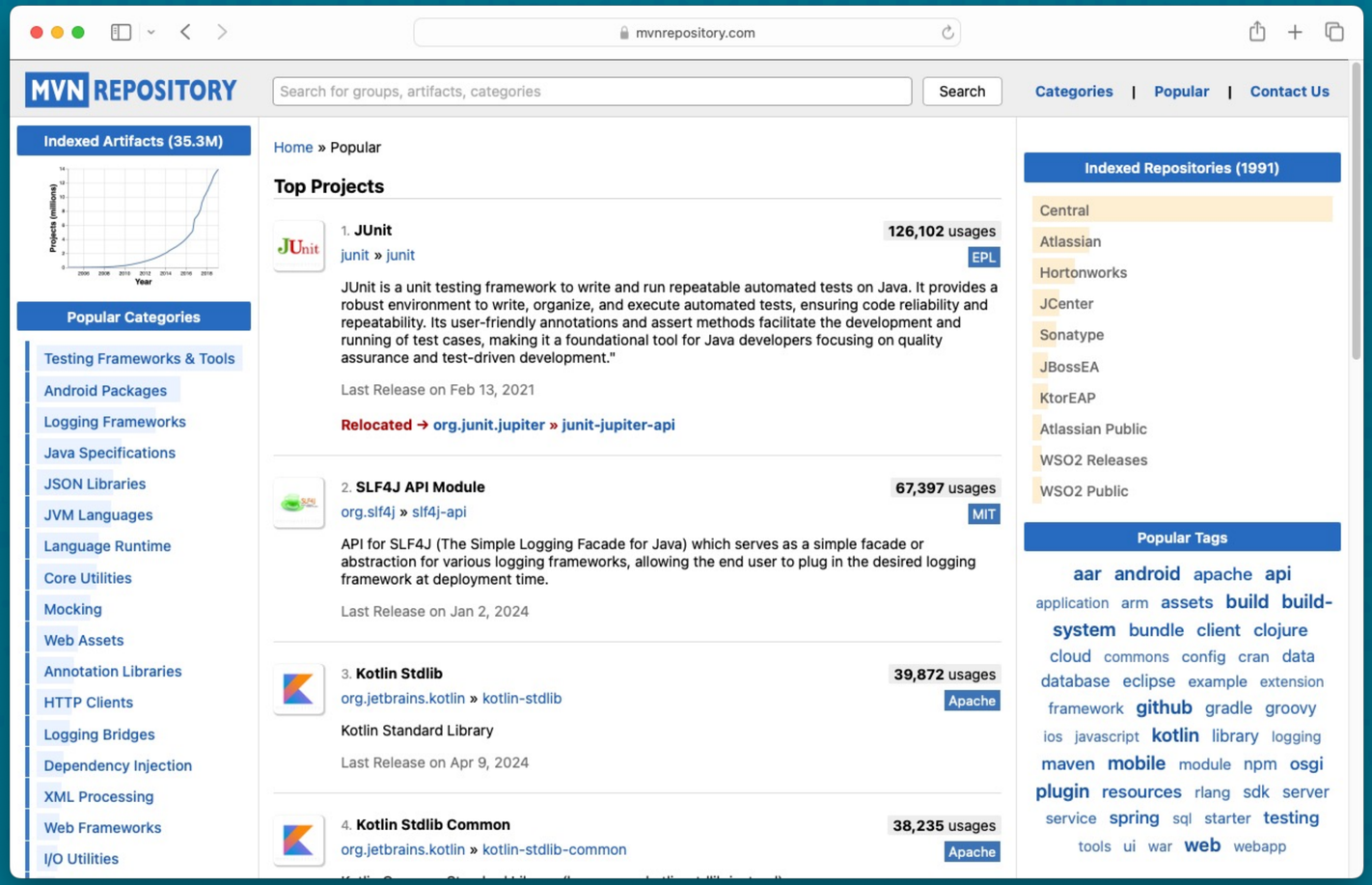
Firefox: ESR = Extended Support Release



https://support.mozilla.org/en-US/kb/firefox-esr-release-cycle as of 2024/04/18

"Multiple release trains" model is well established… for the lower part of the stack: OS, Runtime, Infrastructure…

What about libraries…



https://mvnrepository.com/popular as of 2024/04/18

JUnit

mvnrepository.com

MVN REPOSITORY

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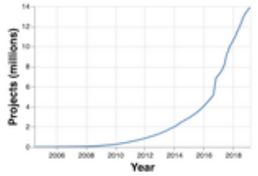
Indexed Artifacts (35.3M)



Popular Categories

- Testing Frameworks & Tools
- Android Packages
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- HTTP Clients
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- Dependency Injection
- XML Processing
- Web Frameworks
- I/O Utilities
- Defect Detection Metadata
- Code Generators

Home » org.junit.jupiter » junit-jupiter-api

JUnit Jupiter API

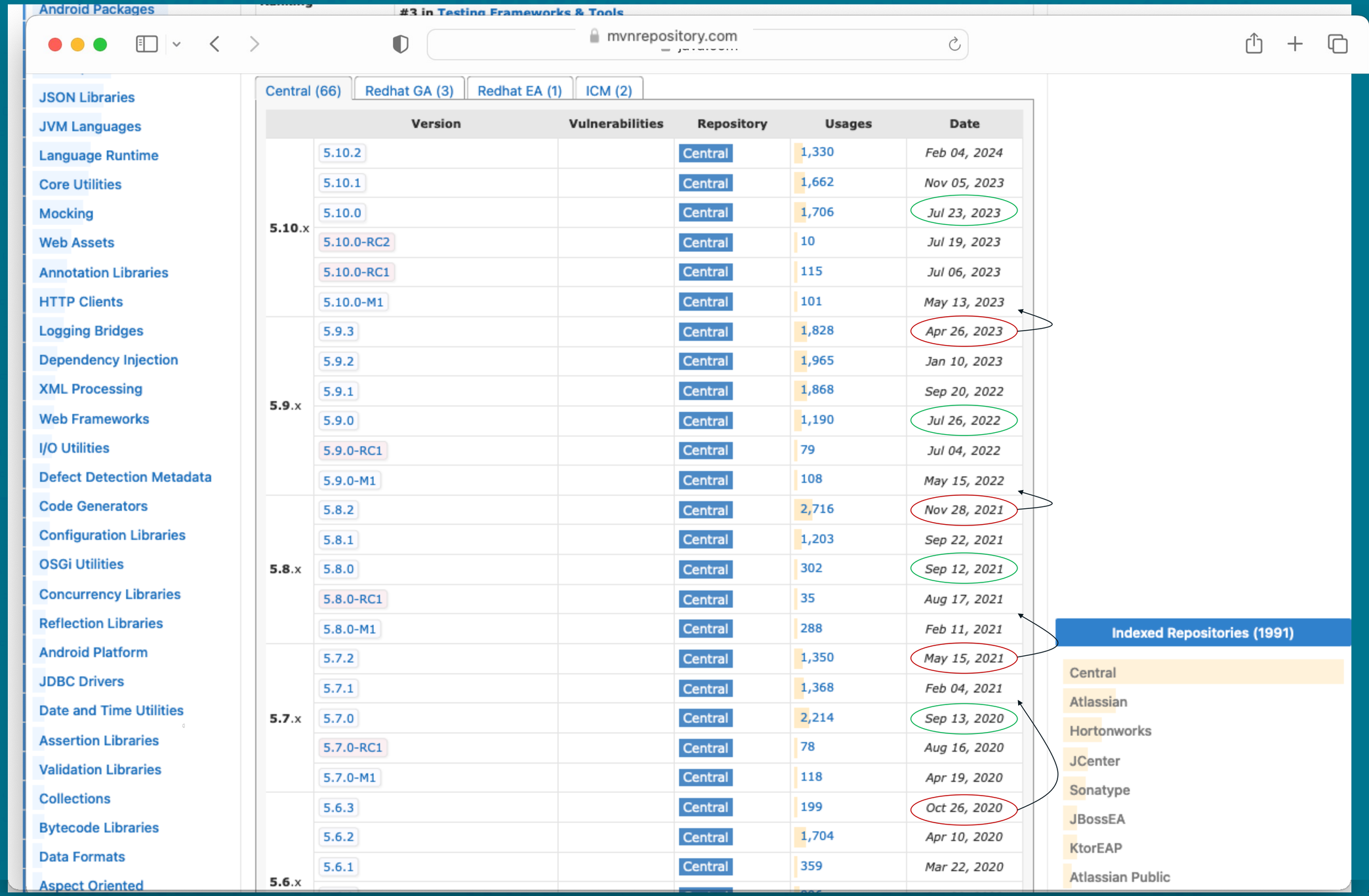
JUnit Jupiter is the API for writing tests using JUnit 5.

License	EPL 2.0
Categories	Testing Frameworks & Tools
Tags	quality junit testing api
Ranking	#22 in MvnRepository (See Top Artifacts) #3 in Testing Frameworks & Tools
Used By	15,172 artifacts

Central (66) | Redhat GA (3) | Redhat EA (1) | ICM (2)

	Version	Vulnerabilities	Repository	Usages	Date
5.10.x	5.10.2		Central	1,330	*Feb 04, 2024*
	5.10.1		Central	1,662	*Nov 05, 2023*
	5.10.0		Central	1,706	*Jul 23, 2023*
	5.10.0-RC2		Central	10	*Jul 19, 2023*
	5.10.0-RC1		Central	115	*Jul 06, 2023*
	5.10.0-M1		Central	101	*May 13, 2023*
5.9.x	5.9.3		Central	1,828	*Apr 26, 2023*
	5.9.2		Central	1,965	*Jan 10, 2023*
	5.9.1		Central	1,868	*Sep 20, 2022*
	5.9.0		Central	1,190	*Jul 26, 2022*
	5.9.0-RC1		Central	79	*Jul 04, 2022*
	5.9.0-M1		Central	108	*May 15, 2022*
	5.8.2		Central	2,716	*Nov 28, 2021*

JUnit


Android Packages
#3 in Testing Frameworks & Tools
mvnrepository.com
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Concurrency Libraries
Reflection Libraries
Android Platform
JDBC Drivers
Date and Time Utilities
Assertion Libraries
Validation Libraries
Collections
Bytecode Libraries
Data Formats
Aspect Oriented
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5.8.0 Central 302 Sep 12, 2021
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5.6.3 Central 199 Oct 26, 2020
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Hortonworks
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Sonatype
JBossEA
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Atlassian Public

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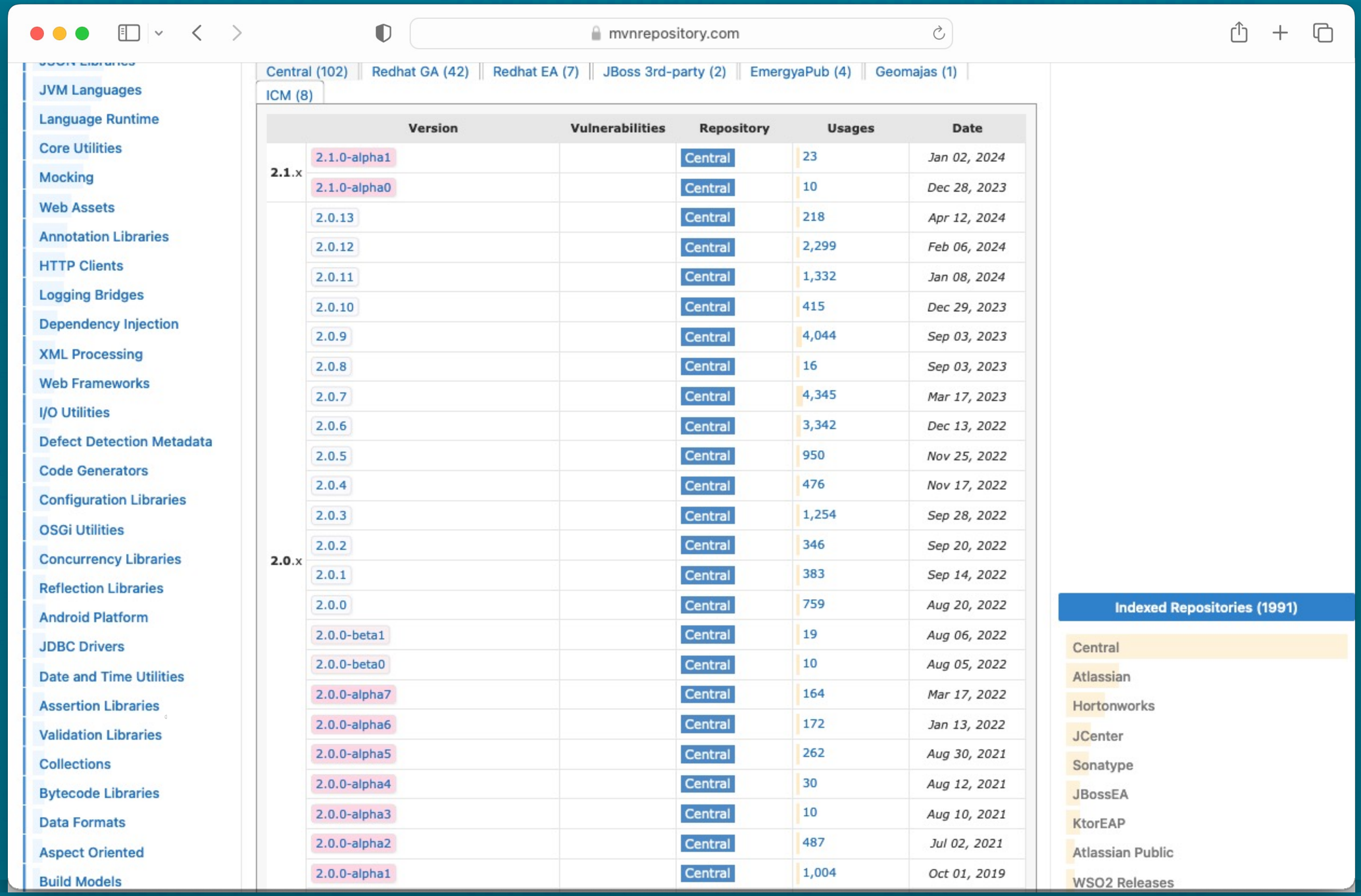
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Build Models
Central (102)
Redhat GA (42)
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JBoss 3rd-party (2)
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2.1.0-alpha0 Central 10 Dec 28, 2023
2.0.x
2.0.13 Central 218 Apr 12, 2024
2.0.12 Central 2,299 Feb 06, 2024
2.0.11 Central 1,332 Jan 08, 2024
2.0.10 Central 415 Dec 29, 2023
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2.0.8 Central 16 Sep 03, 2023
2.0.7 Central 4,345 Mar 17, 2023
2.0.6 Central 3,342 Dec 13, 2022
2.0.5 Central 950 Nov 25, 2022
2.0.4 Central 476 Nov 17, 2022
2.0.3 Central 1,254 Sep 28, 2022
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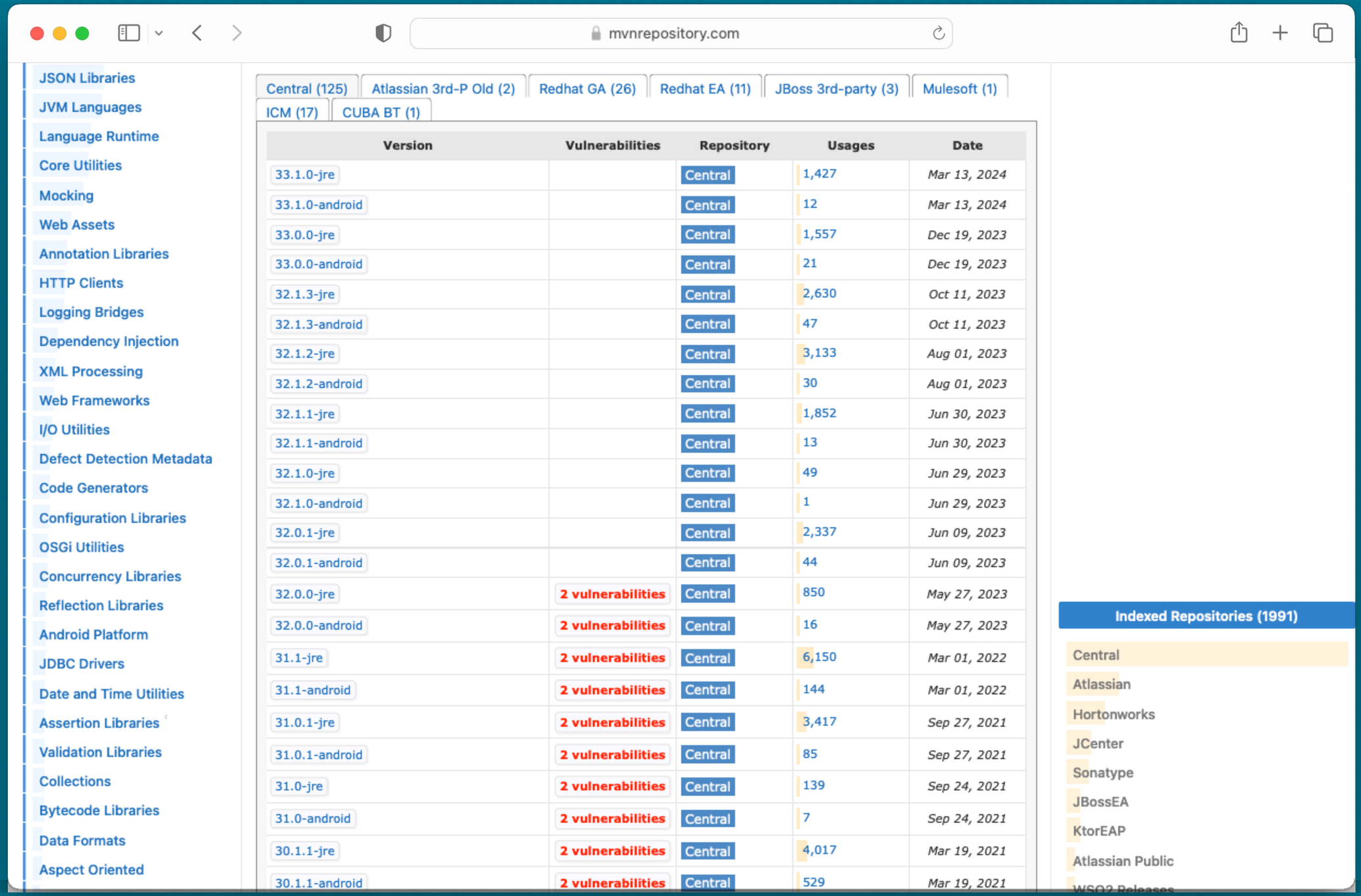
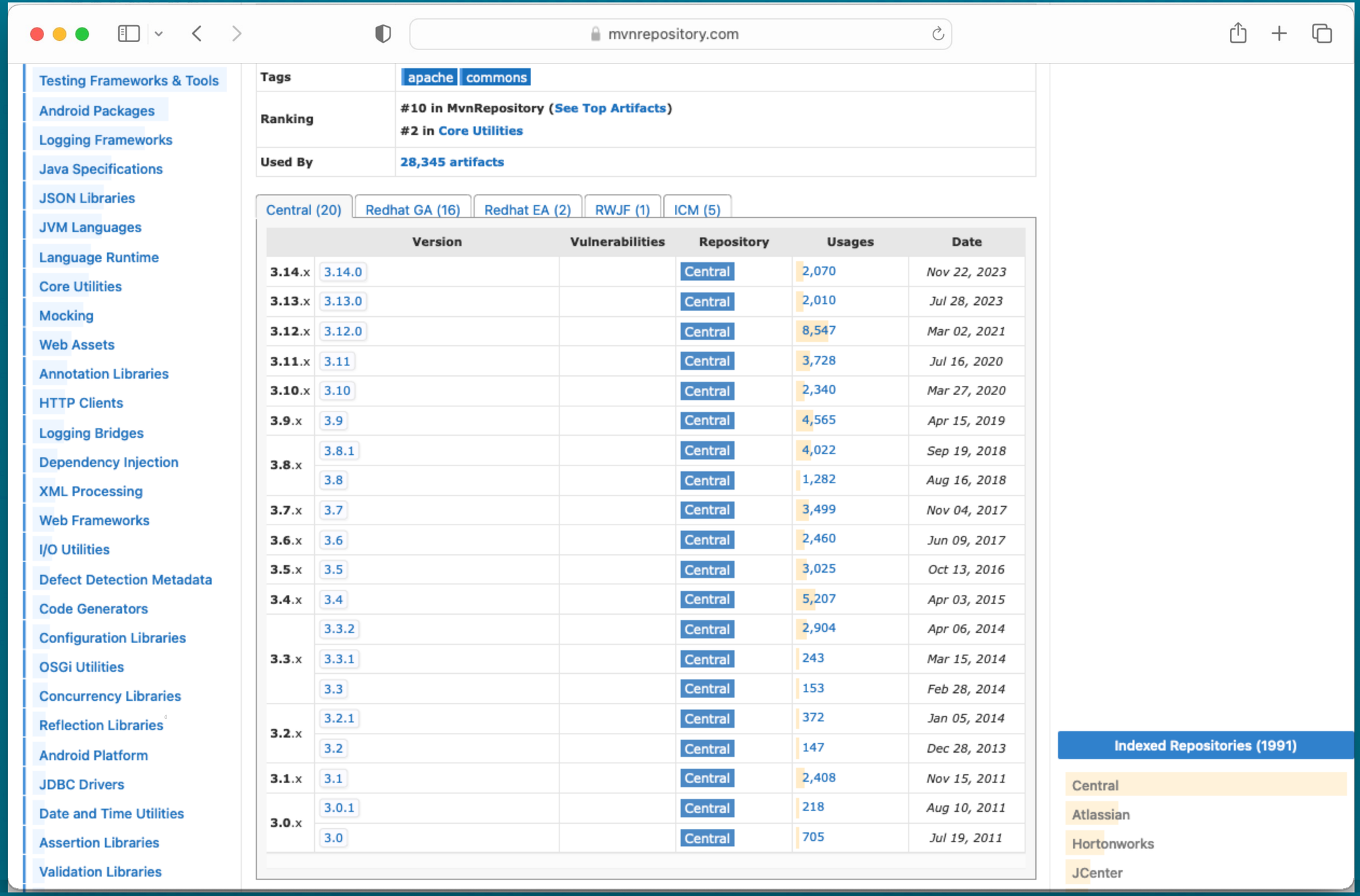
Google Guava



Apache Commons



Open source libraries tend to offer a single "one-size fits all" version to cover everything

Obvious Cost vs Hidden Costs

Single version

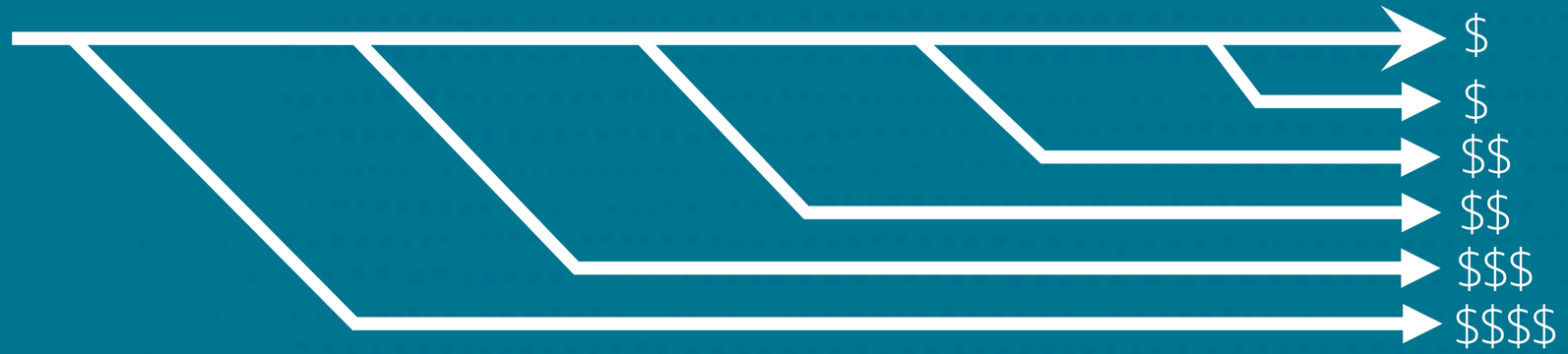
Works well when everyone can use the latest/only version

https://designer.microsoft.com/image-creator

One version to serve them all

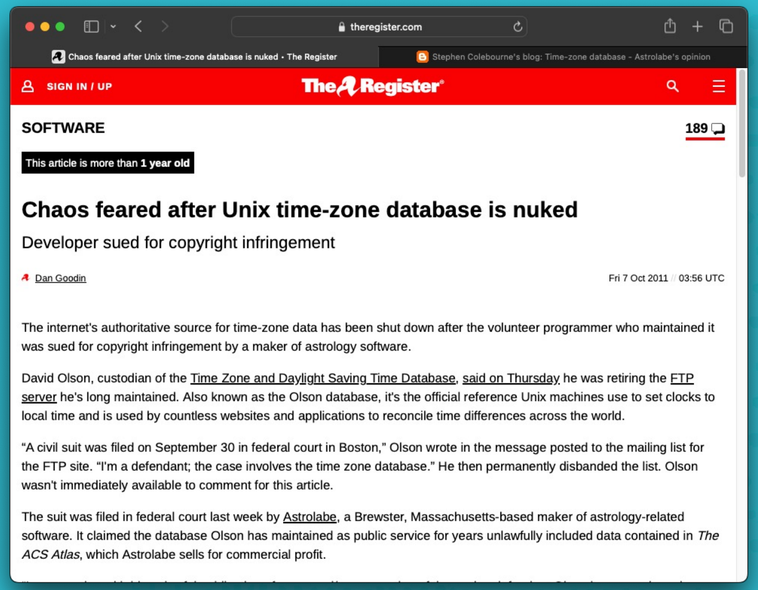
Can only use features/language from the oldest release

Multiple Parallel Versions

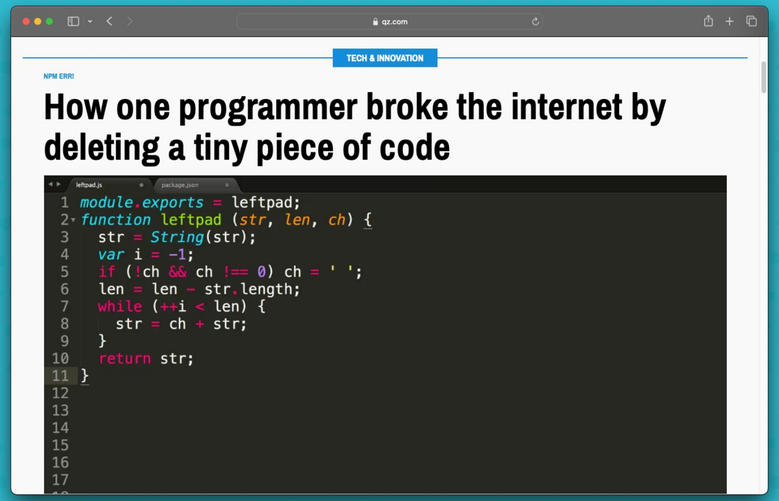


More branches = more resources

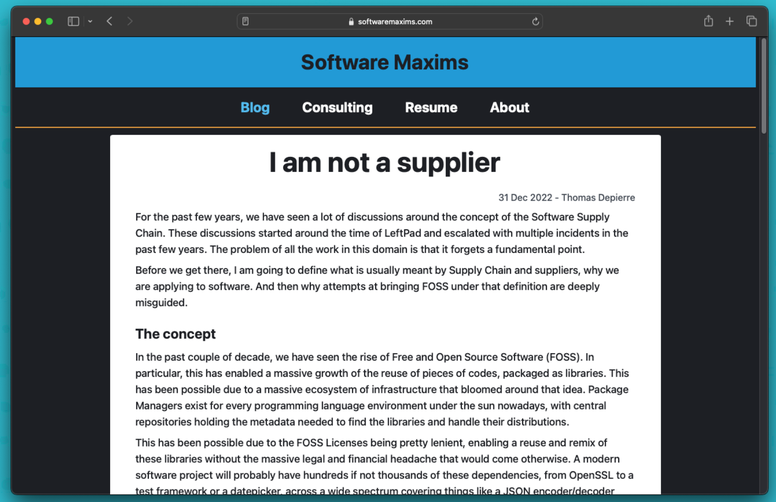
As differences between tip and branch(tail) increase it gets pricier to maintain the branch



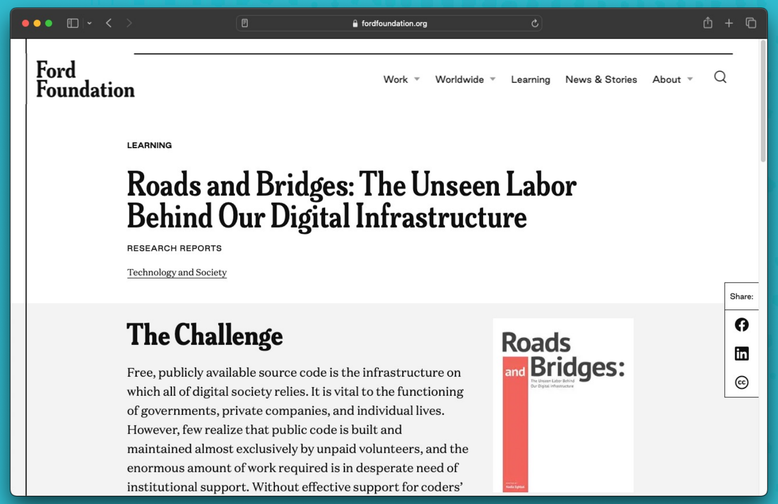
2011: https://www.theregister.com/2011/10/07/unix_time_zone_database_destroyed/



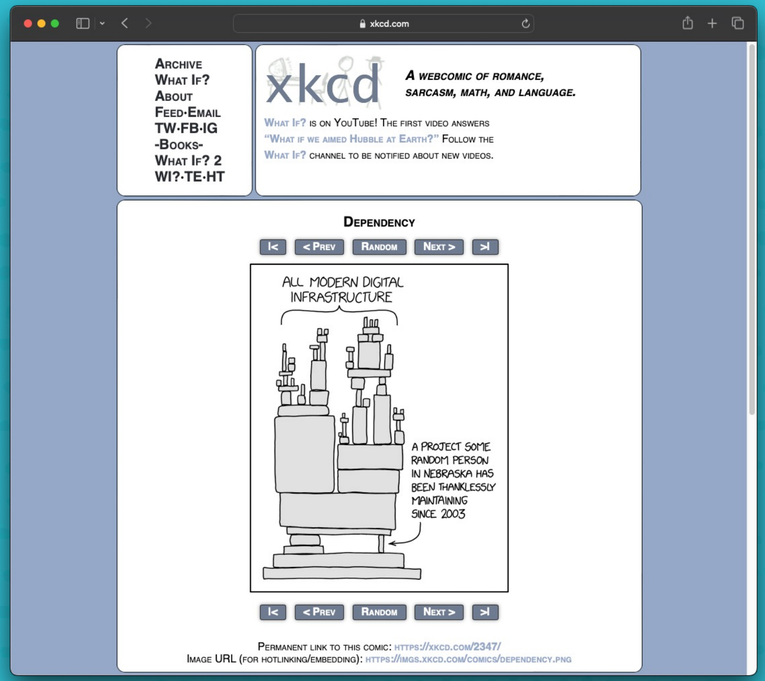
2016 Re Left Pad: https://qz.com/646467/how-one-programmer-broke-the-internet-by-deleting-a-tiny-piece-of-code



2022: https://www.softwaremaxims.com/blog/not-a-supplier



2016: https://www.fordfoundation.org/work/learning/research-reports/roads-and-bridges-the-unseen-labor-behind-our-digital-infrastructure/



2020: https://xkcd.com/2347/

2024 (re Xz backdoor)
https://mastodon.social/@glyph/112180922900094371

Can we all just move to only latest?

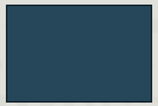
If we could create the right migration tool…

Can it be done?

- Third party components and tools
- Deprecated/removed/encapsulated features without a clear path: Windows-32, Web Start (and even applets), use of internal APIs, security manager, CORBA, configuration changes, and others
- Non-trivial changes: Reactive to virtual threads, JNI to FFM API

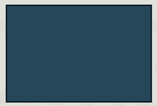
How many users would hold out?

Typical JDK corporate adoption (so far)



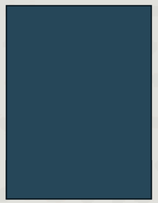
JDK X

Typical JDK corporate adoption (so far)



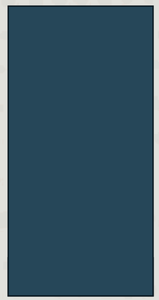
JDK X JDK X+1

Typical JDK corporate adoption (so far)



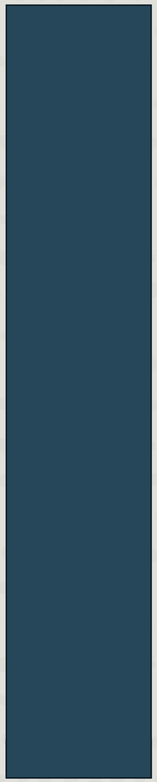
JDK X JDK X+1

Typical JDK corporate adoption (so far)



JDK X JDK X+1 JDK X+2

Typical JDK corporate adoption (so far)

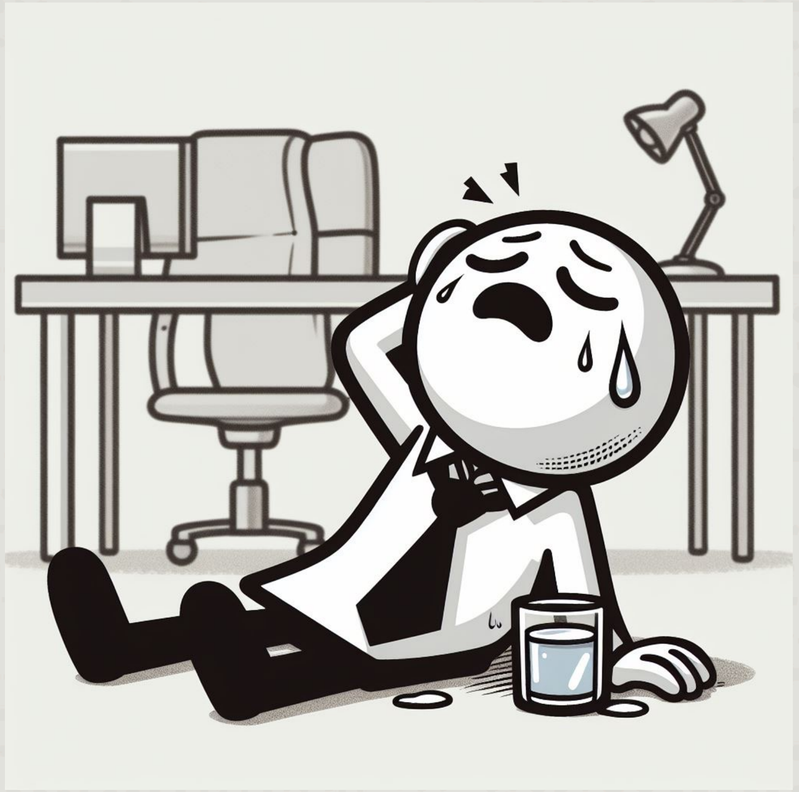


JDK X

https://designer.microsoft.com/image-creator

JDK X+many

Typical JDK corporate adoption (so far)



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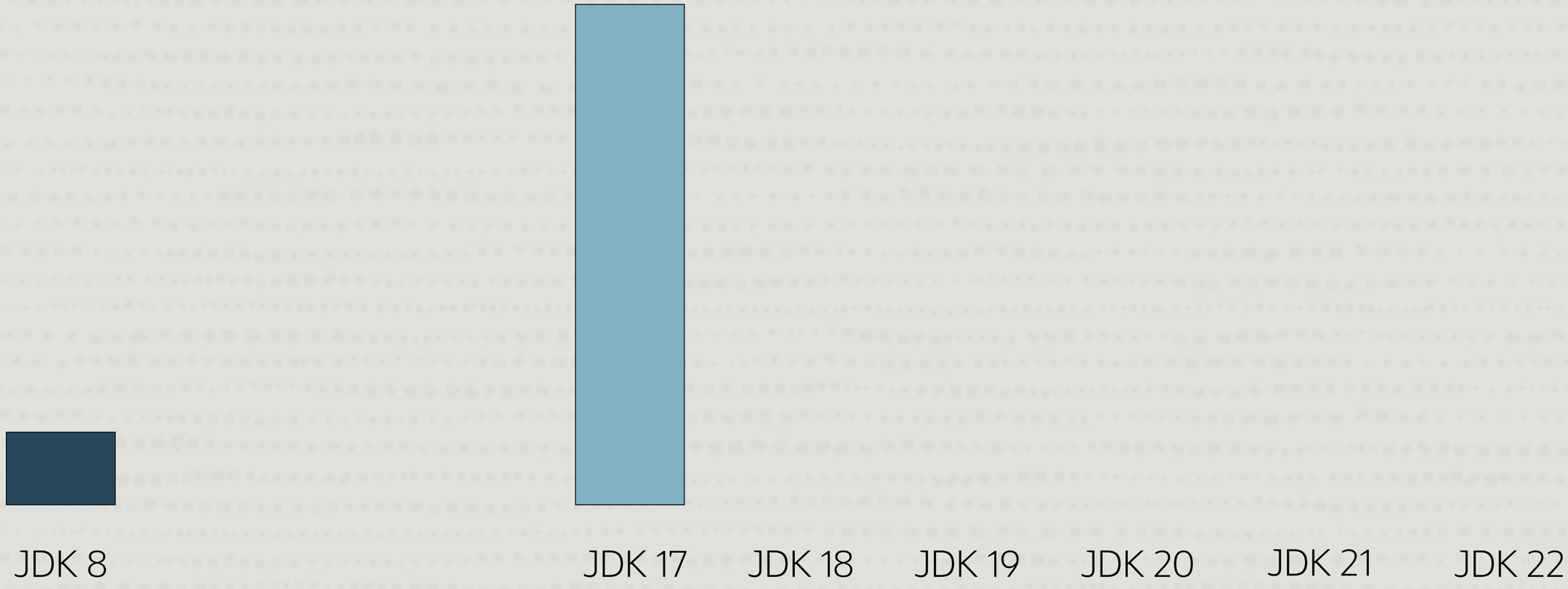
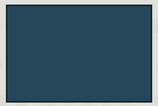
JDK X

JDK X+many

Typical JDK corporate adoption (so far)



Better JDK corporate adoption



JDK X

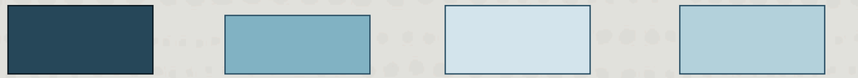
Better JDK corporate adoption

JDK X JDK X+1

Better JDK corporate adoption

JDK X JDK X+1 JDK X+2

Better JDK corporate adoption



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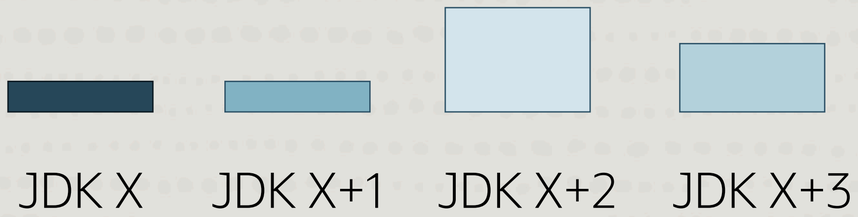

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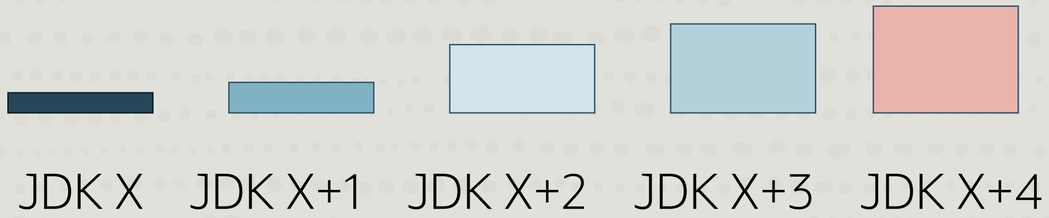
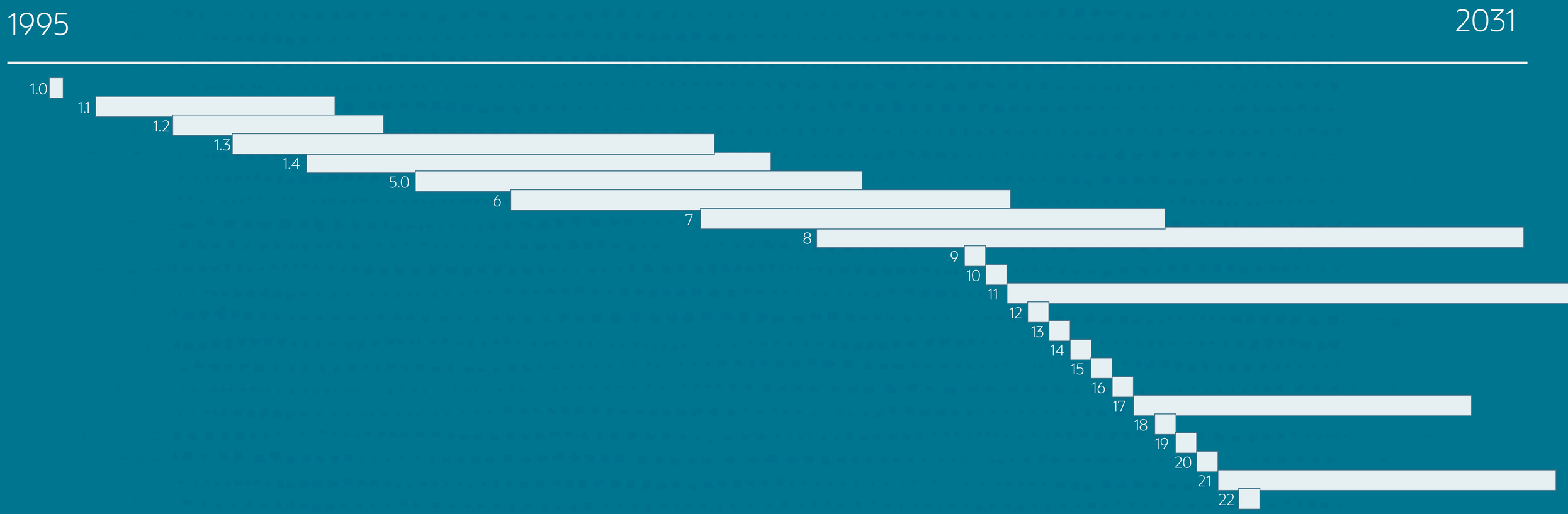


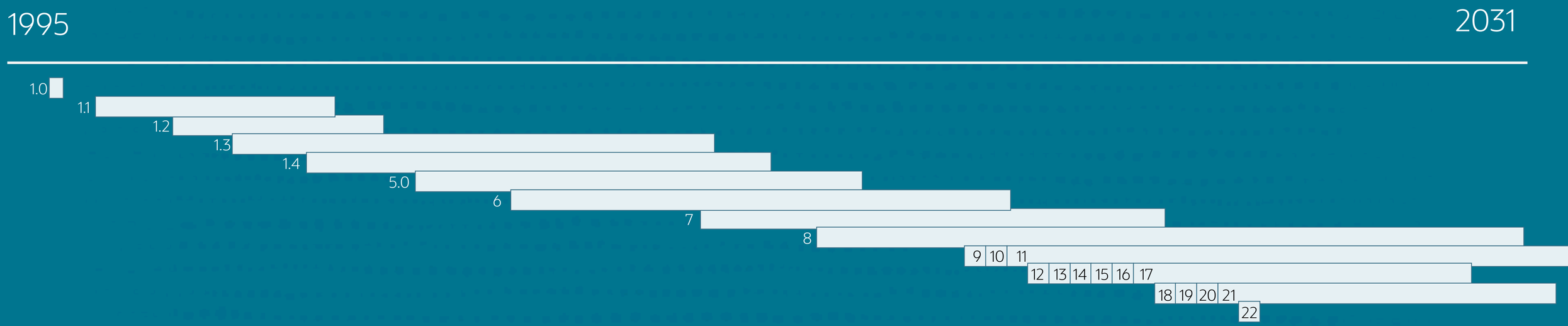
Should we use **all** releases?

For this model think of non-LTS releases as "part" of the **next** LTS



Should we use **all** releases? YES

For this model think of non-LTS releases as "part" of the **next** LTS



What do we need to make this model more common

Tools and libraries adopting/supporting new JDK versions quickly (ideally at GA)

- And supporting older Java versions long enough to allow applications to stay put for most/all their lifetime [with only critical fixes]

Development "best practices" and corporate culture to accept multiple runtime versions coexisting

- The right Java version depends on the type of application and where it is on its own lifecycle; not on what every other applications runs on


Java™