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# Secure Your Cloud-Native Software Supply Chain

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# Anchore SBOM Workshop

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2023-09-26

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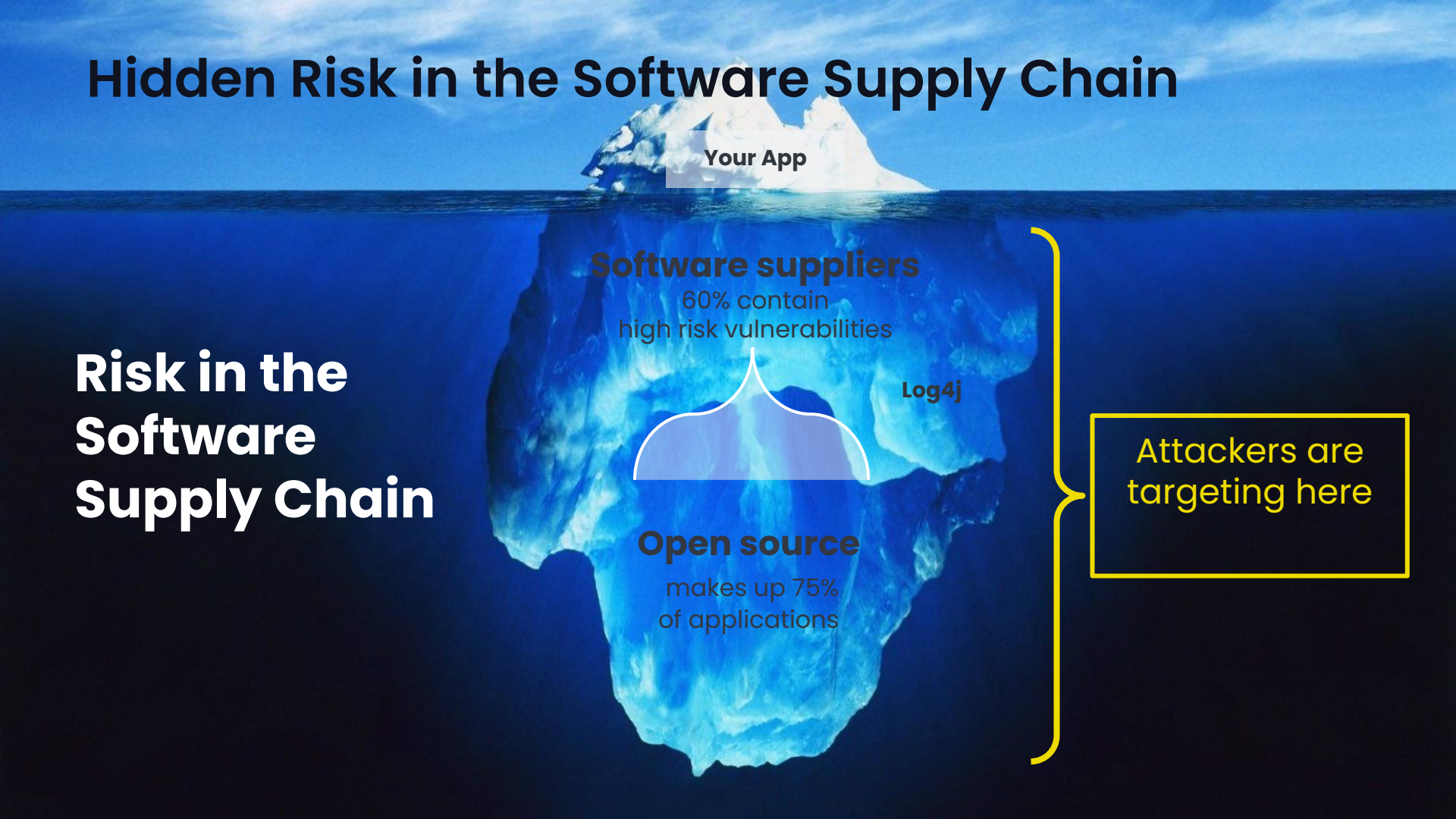
# What is the Software Supply Chain?

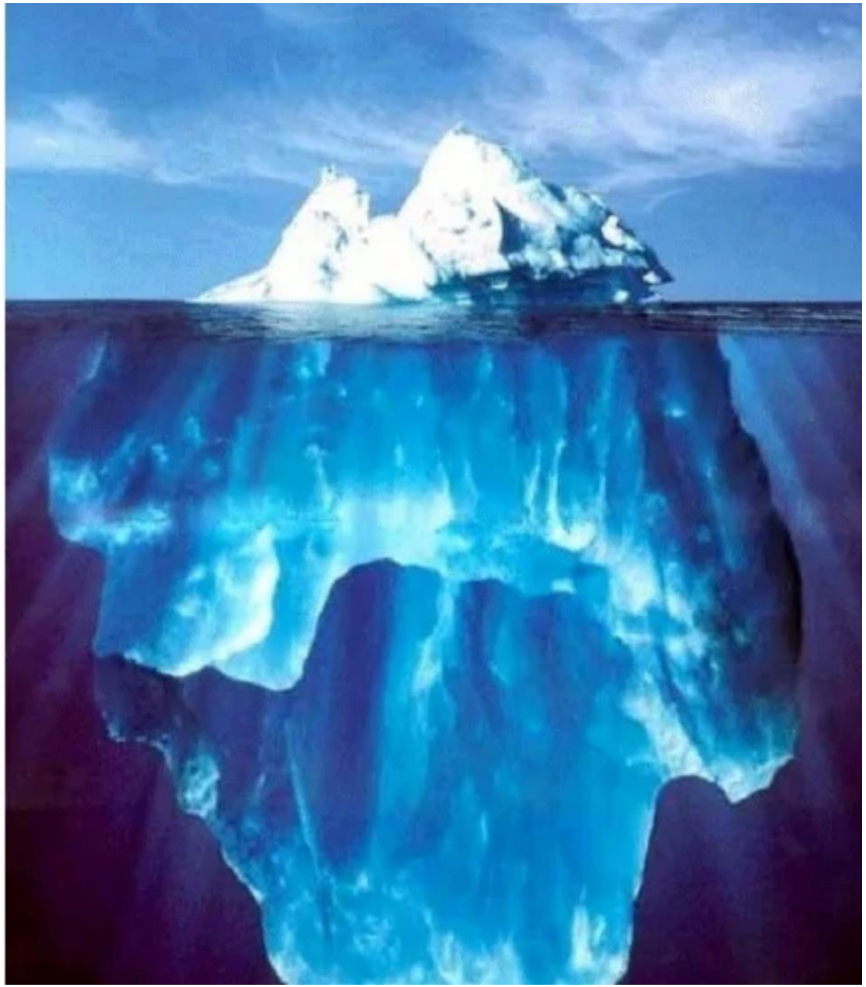
# Hidden Risk in the Software Supply Chain

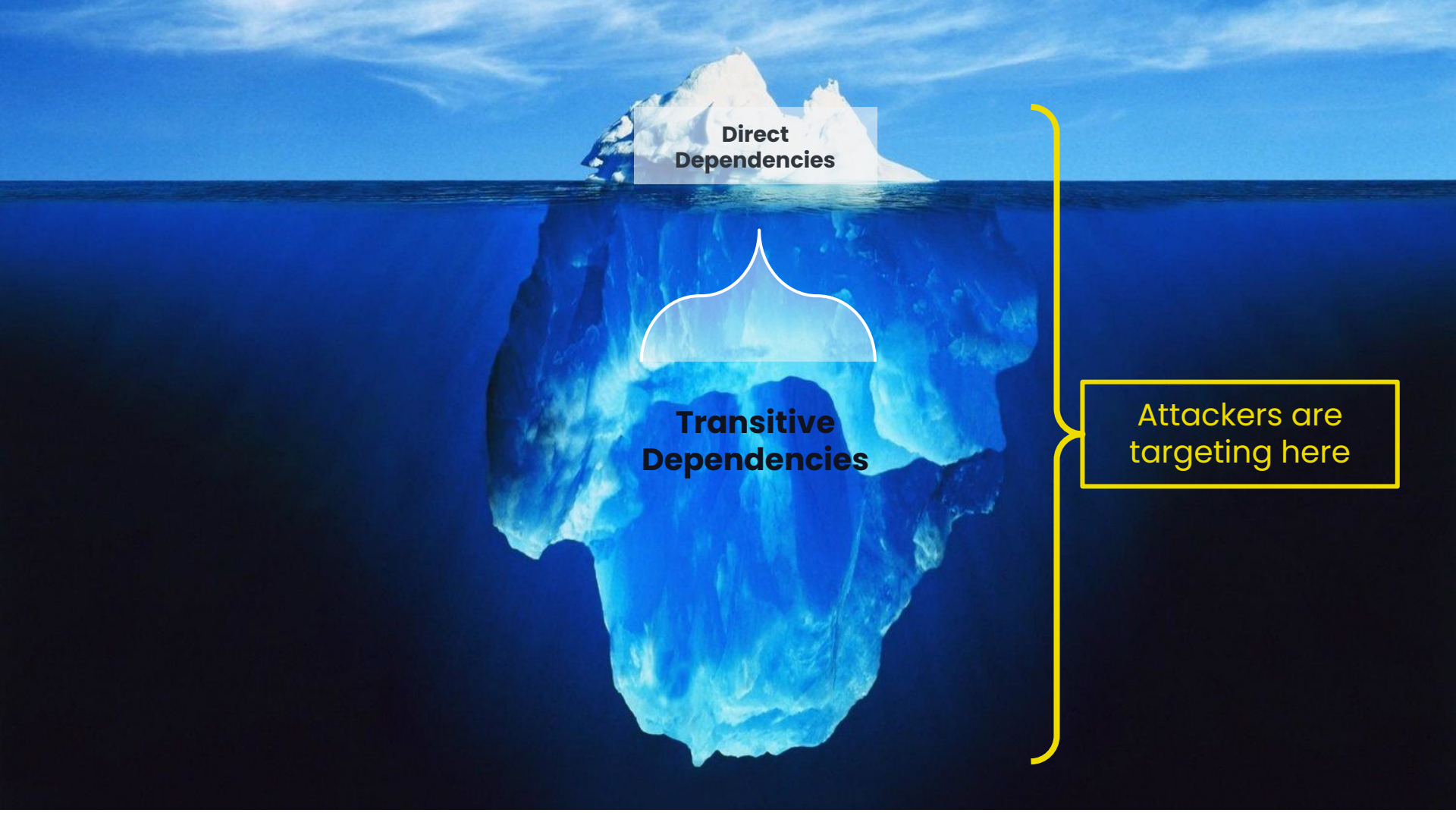



**Risk in the Software Supply Chain**

# Free is Just the Tip of the Iceberg: Open Source Library System Software

Lori Bowen Ayre
lori.ayre@galecia.com
METRO Webinar
October 6, 2009

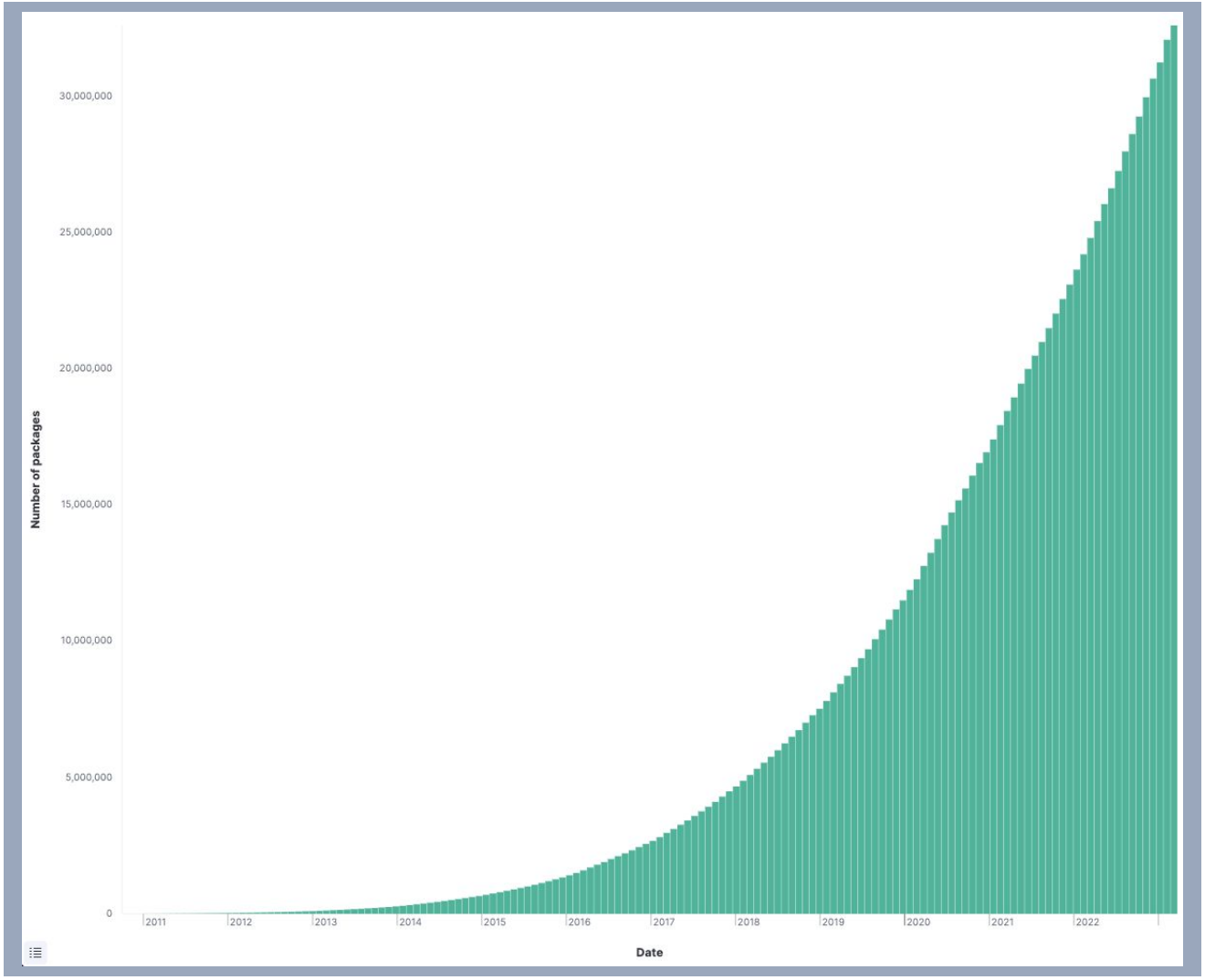



Direct
Dependencies
Transitive
Dependencies
Attackers are
targeting here

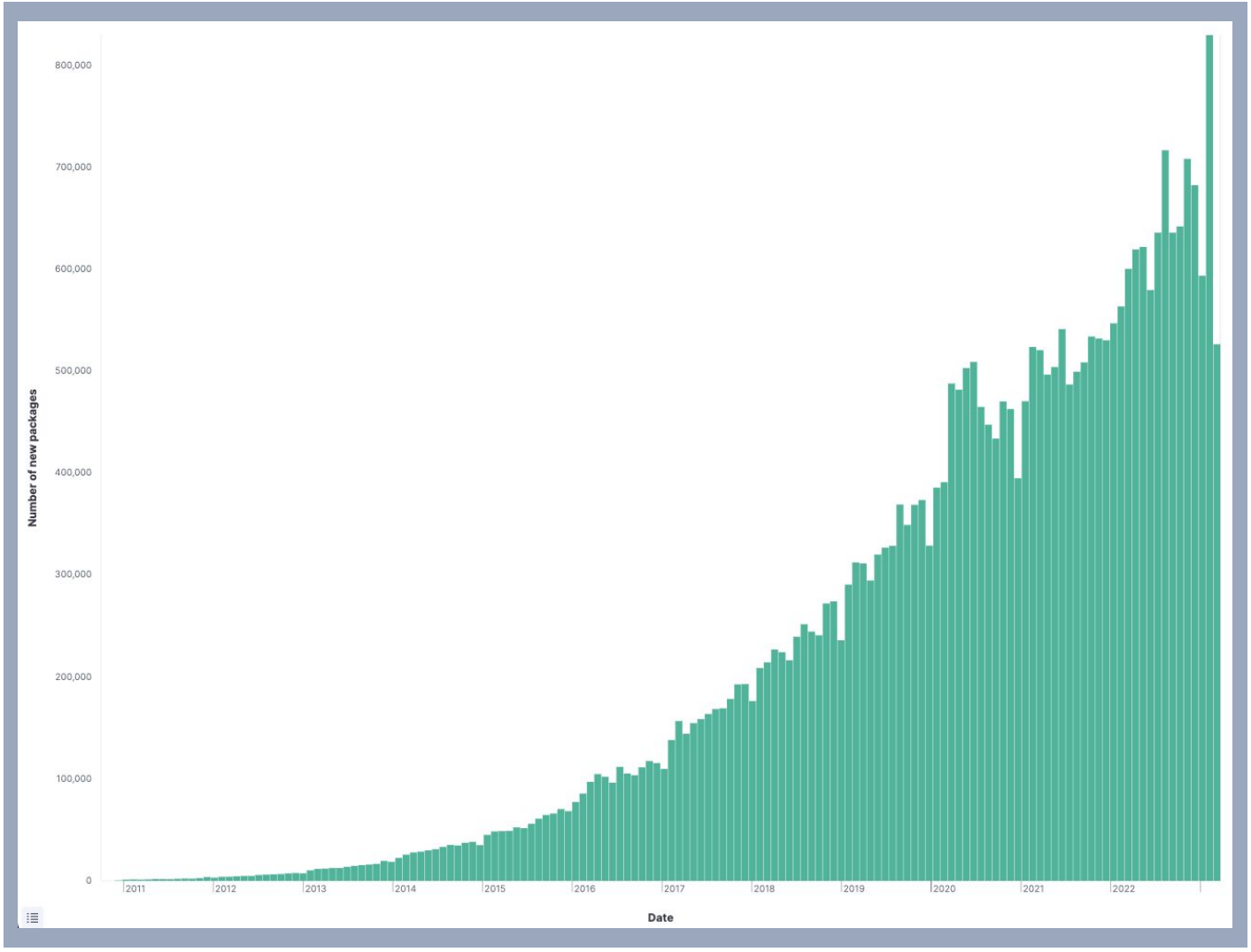
# This metaphor...

- You've seen this iceberg metaphor. I've used this metaphor 100 times, I've criticized this metaphor.
- This is an OLD metaphor
- Things have changed a lot but we're still thinking about old systems
- https://www.slideshare.net/loriayre/open-source-library-system-software-free-is-just-the-tip-of-the-iceberg
- They're attacking the bottom now - that's a supply chain attack
- But really, the top isn't "your code" - the top is your direct dependencies, bottom is transitive
- You can only directly control what's at the top
- They're attacking the whole iceberg, but you probably only know about the stuff at the top

Number of
NPM packages



Number of
NEW packages

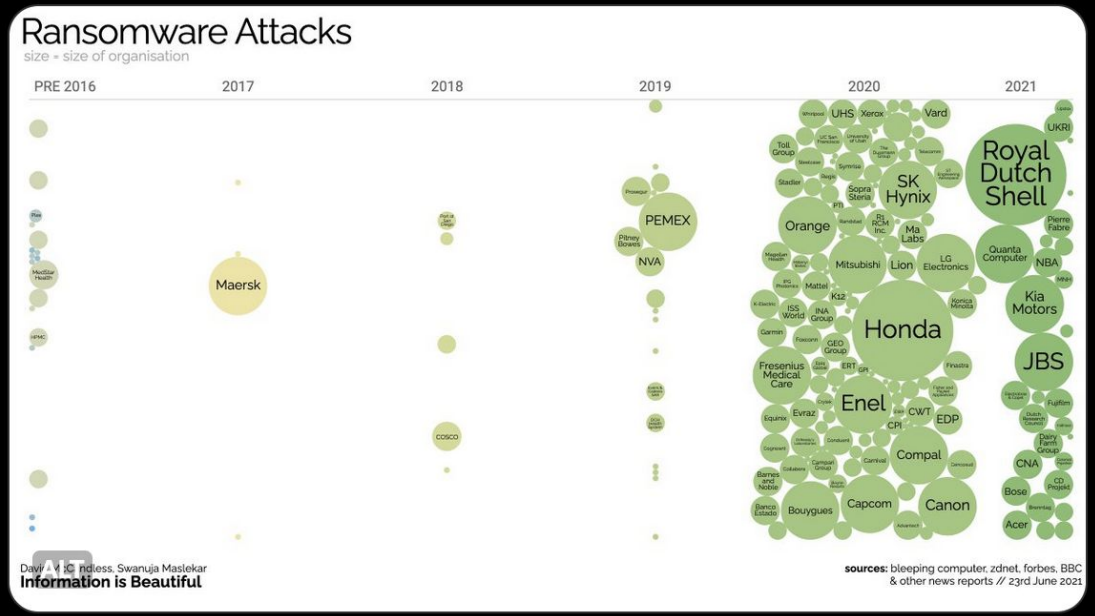


# Open source is huge

- NPM introduced 2010
- 32 million packages (as of March 2023)
- Approx. 1,000,000 new packages **per month**
- That’s just NPM!

**Information is Beautiful**
@infobeautiful

Are #Ransomware attacks increasing? I think #Ransomware attacks are increasing...
interactive: bit.ly/3h1IYPs

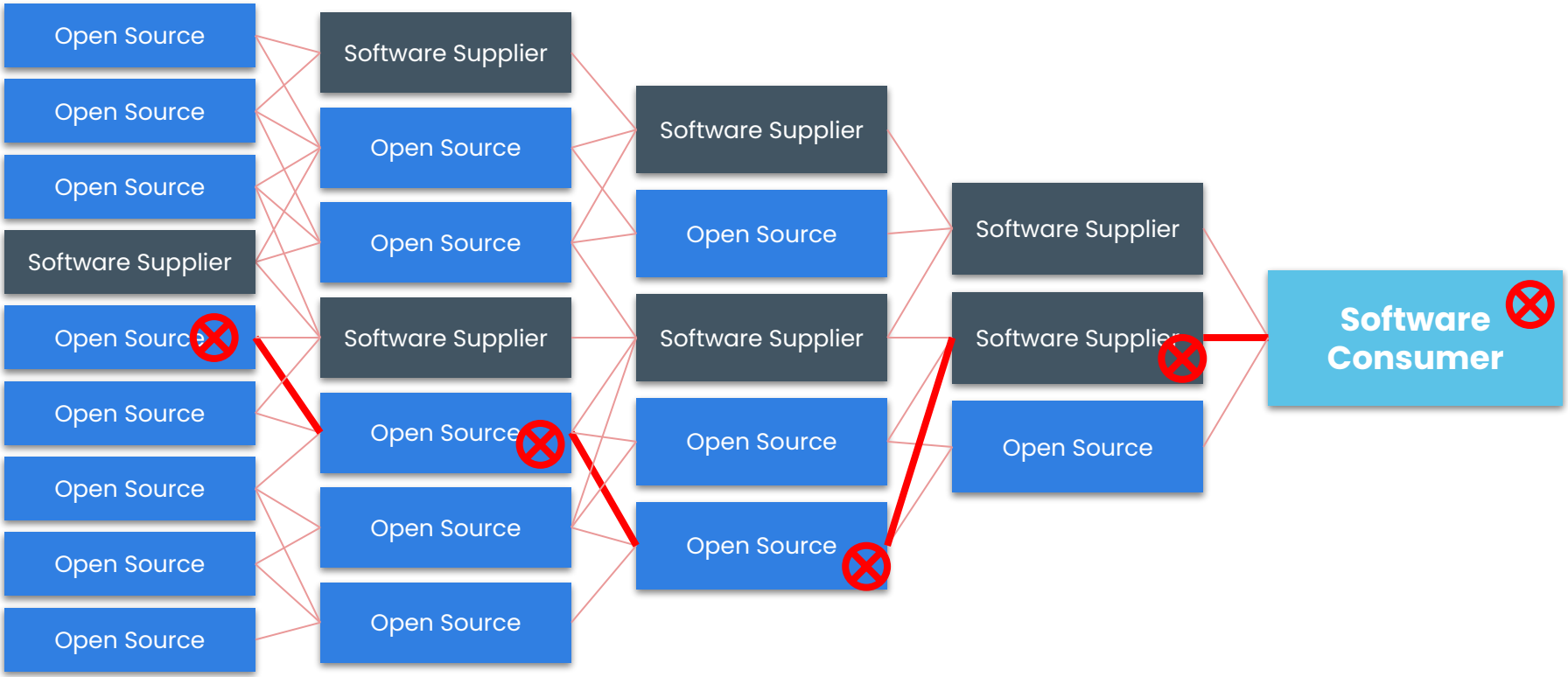



11:33 AM · Jun 23, 2021

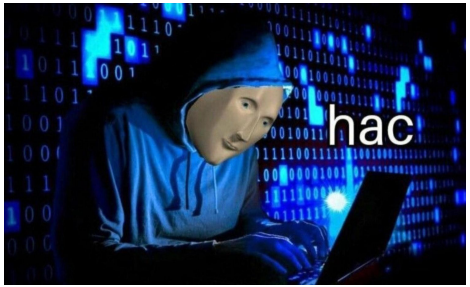
# The predictable consequence

- Ransomware has exploded along with transitive dependencies and open source in general
- I don’t believe in coincidences

# Software Supply Chain: The Problem



# The Reverse Funnel




**Compromised Package**

Downstream Consumer
Downstream Consumer
Open Source

Downstream Consumer
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Open Source

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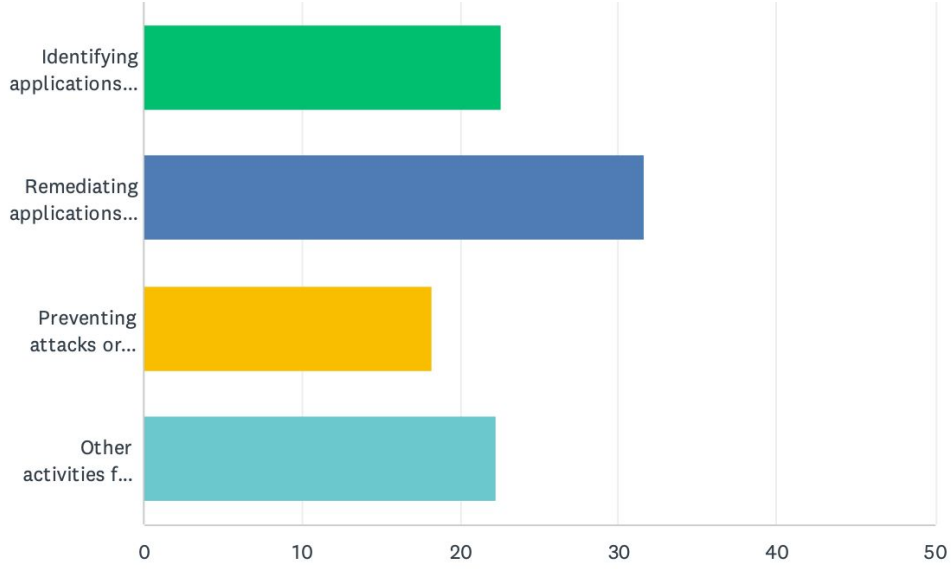
# What is a Software Bill of Materials?

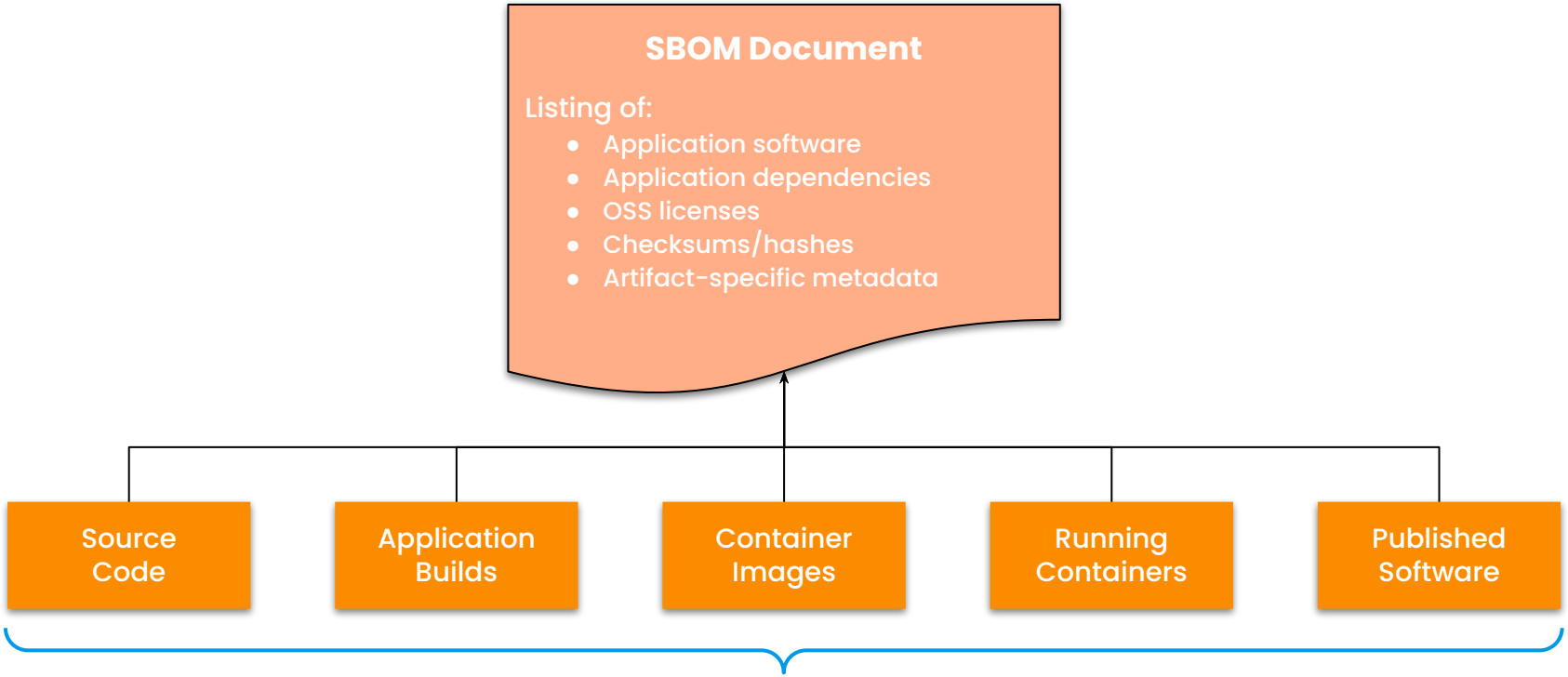
# What is an SBOM?


# Q12 Estimate how many hours you personally have spent to date on each of the following activities.

Answered: 195 Skipped: 15



# What is an SBOM?




Types of artifacts from which SBOMs can be generated

# If We Knew What We are Consuming

- People spent insane amounts of time just finding log4j, because nobody knew where (or even if) it was hiding
- Knowing = Faster Remediation
- SBOMs help, a LOT, but…
  - They aren't a silver bullet
  - Scanners aren't perfect (e.g. can't penetrate binary blobs, cf. OpenSSL3.)
  - Not all SBOMs are equal
  - SBOMs aren't ubiquitous (yet) (producers aren't reliably supplying them)
  - SBOMs are more accurate and useful when producers/maintainers generate them BUT something is better than nothing
  - SBOM management is hard
  - Any SBOM generated before an actual build is suspect (transitive deps)
  - SBOM Everywhere: https://github.com/ossf/sbom-everywhere
  - I don't know what the end game is but generating them is better than nothing, figure out the details later

# SBOM Takeaways

00 SBOMs enable continuous, automated security/compliance checks, reduce time spent identifying and remediating issues

01 SBOMs improve a lot of things but do not solve every problem you have

02 Log4j is extremely easy to find, OpenSSL 3 is often obscured

03 SBOMs are more effective when created by maintainers rather than consumers, but something is better than nothing

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# SBOM Reading List

Making Better SBOMs: https://kccncna2022.sched.com/event/182GT/ – https://www.youtube.com/watch?v=earq775L4fc

Reflections on Trusting Trust: https://www.cs.cmu.edu/~rdriley/487/papers/Thompson_1984_ReflectionsonTrustingTrust.pdf

Generate sboms with syft and jenkins: https://www.youtube.com/watch?v=nMLveJ_TxAs

Profound Podcast - Episode 10 (John Willis and Josh Corman):
https://www.buzzsprout.com/1758599/8761108-profound-dr-deming-episode-10-josh-corman-captain-america

GitHub Self-Service SBOMs: https://github.blog/2023-03-28-introducing-self-service-sboms/

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# The Future of Software Supply Chain Security

An Example Project Health Metric:

Number of Maintainers

**Paul Novarese** (He/Him) • You
Software Supply Chain Security at Anchore
1yr • Edited •

The #log4j debacle is going to have ramifications far beyond the vulnerability itself. There has been a lot of inertia in how issues are evaluated and classified, how information about those issues is disseminated, and how organizations respond to them, and #log4shell has exposed a lot of these problems. This will be a catalyst for a lot of changes that are way overdue.

**April King**
@CubicleApril

The fact that there are almost 10,000 CVEs with the same CVSS score as the Log4j vulnerability suggests to me that maybe the scale should be logarithmic.

6:26 PM · Dec 11, 2021 · Twitter for iPhone

**71** Retweets **6** Quote Tweets **736** Likes

# CVE-2020-19909

On August 25 2023, we got an email to the curl-library mailing list from Samuel Henrique that informed us that "someone" had recently created a CVE, a security vulnerability identification number and report really, for a curl problem.

```
I wanted to let you know that there's a recent
curl CVE published and it doesn't look like it
was acknowledged by the curl authors since it's
not mentioned in the curl website: CVE-2020-19909
```

We can't tell who filed it. We just know that it is now there.

# September 4, 2023 – September 11, 2023

Period: 1 week

## Overview

**20** Active pull requests

**13** Active issues

| 16 | 4 | 6 | 7 |
|---|---|---|---|
| Merged pull requests | Open pull requests | Closed issues | New issues |

Excluding merges, **9 authors** have pushed **16 commits** to main and **21 commits** to all branches. On main, **20 files** have changed and there have been **240 additions** and **124 deletions**.


**1** Release published by **1** person

**v0.90.0**
published 3 hours ago

**16** Pull requests merged by **7** people

**fix the help output of power-user**
#2113 merged 8 hours ago

# OK, If Not CVSS, Then What?

- GHSAs (more transparent than CVEs)
- CISA KEV, EPSS, VEX &c
- GitHub Insights and other project health metrics
  - This is (currently) a very manual process
  - But it's getting a lot easier
  - Project health isn't **directly** about safety
  - What happens when it hits the fan?

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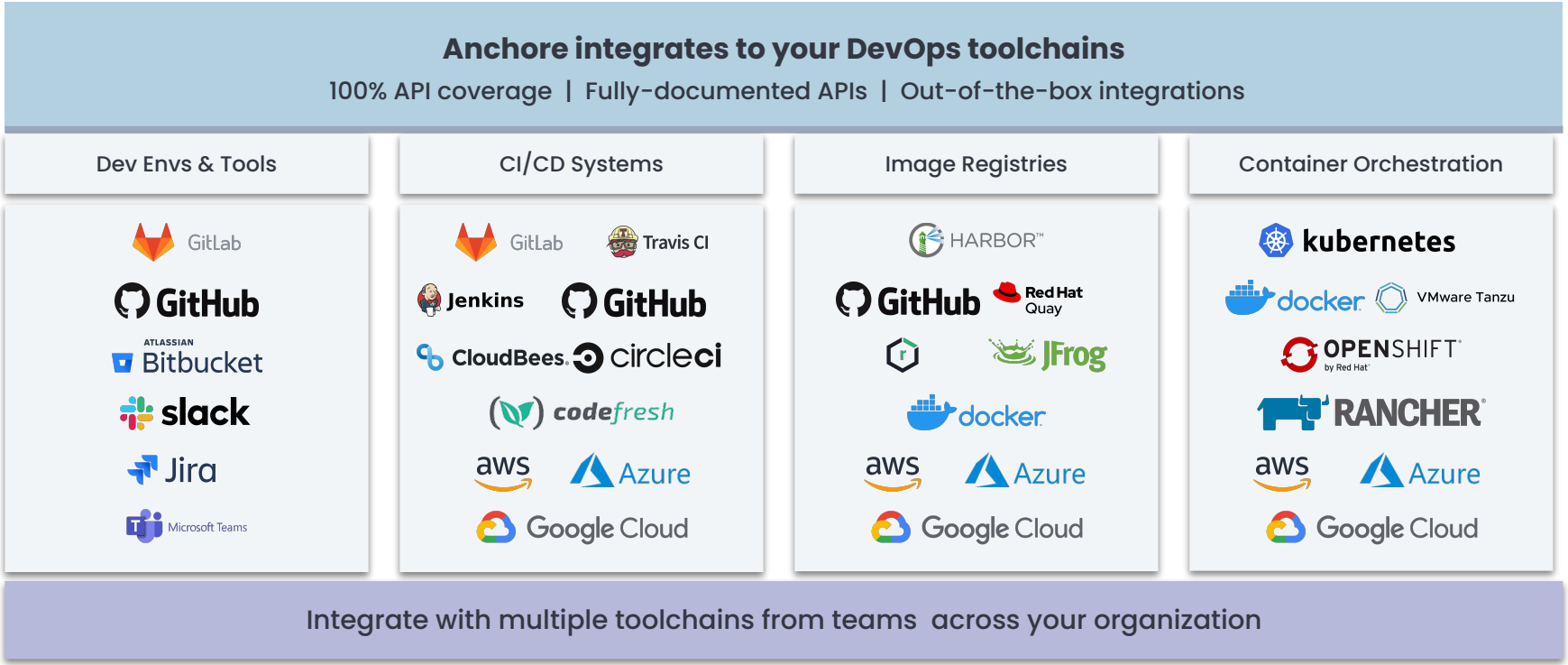
# Introducing Anchore

# Automation-Centric, 100% API Coverage

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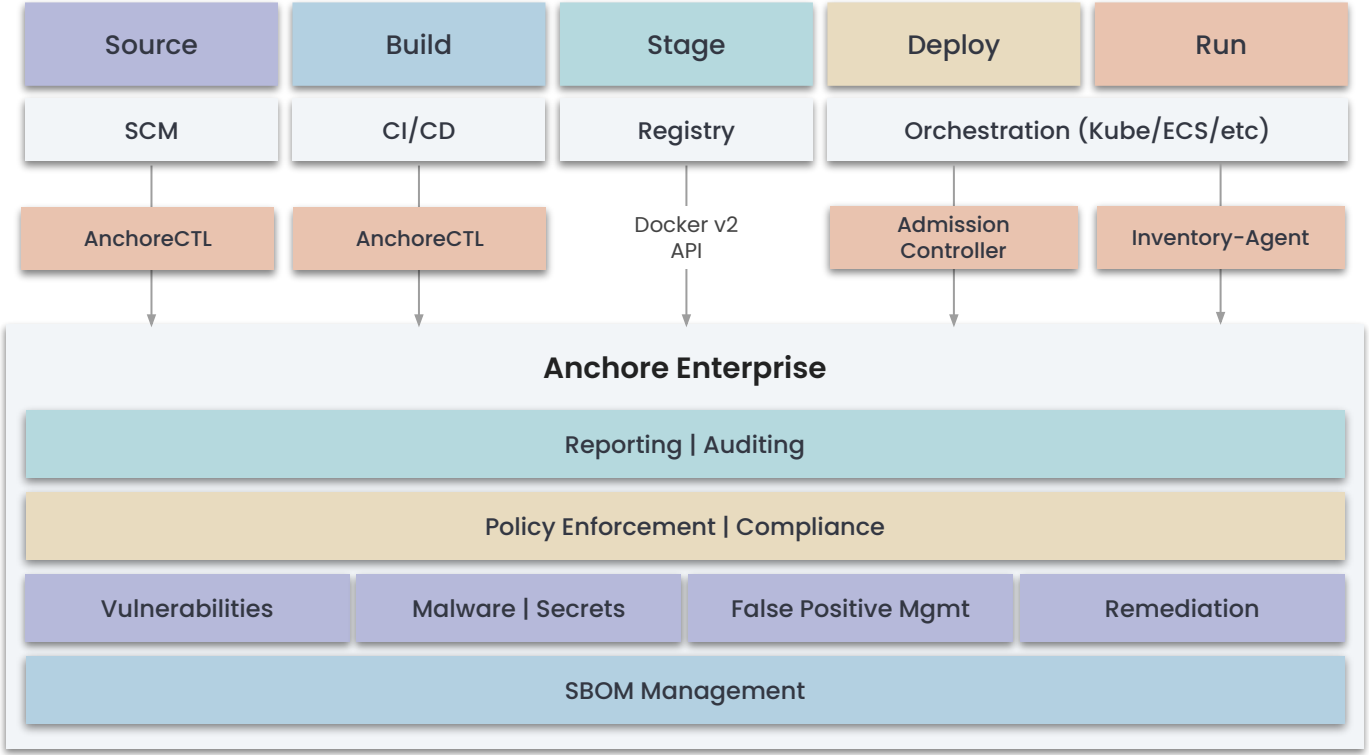
# Anchore Enterprise: How it Works




## Enterprise Capabilities

- Linux **and Windows** containers
- **Malware & secrets** scanning in addition to vulnerabilities
- **Fully-supported** integrations with CI/CD tools
- **Continuous scanning** from develop to runtime
- **Persist SBOMs and security results** across apps and teams
- **Enhanced** vulnerability feed
- **Centralized policy** enforcement with pre-built policy packs
- API/GUI for **reporting and auditing**
- **Notifications**
- **Remediation** recommendations & workflows
- **Enterprise control** with support for RBAC, SSO, LDAP
- **SLA Technical Support**

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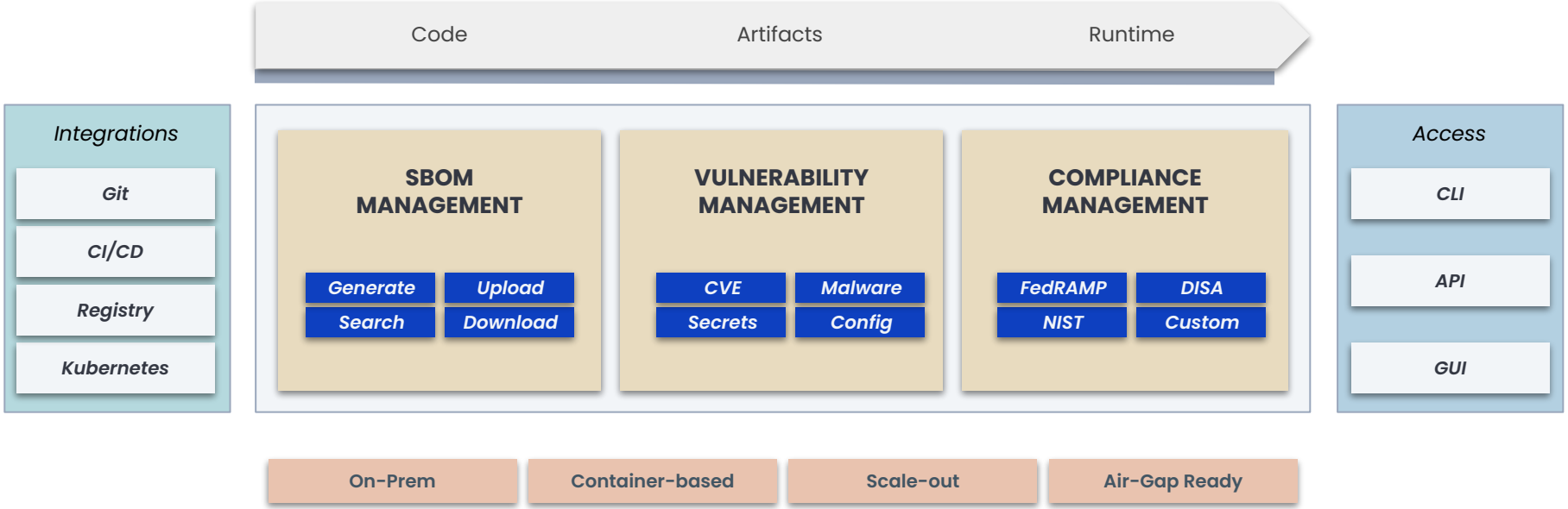
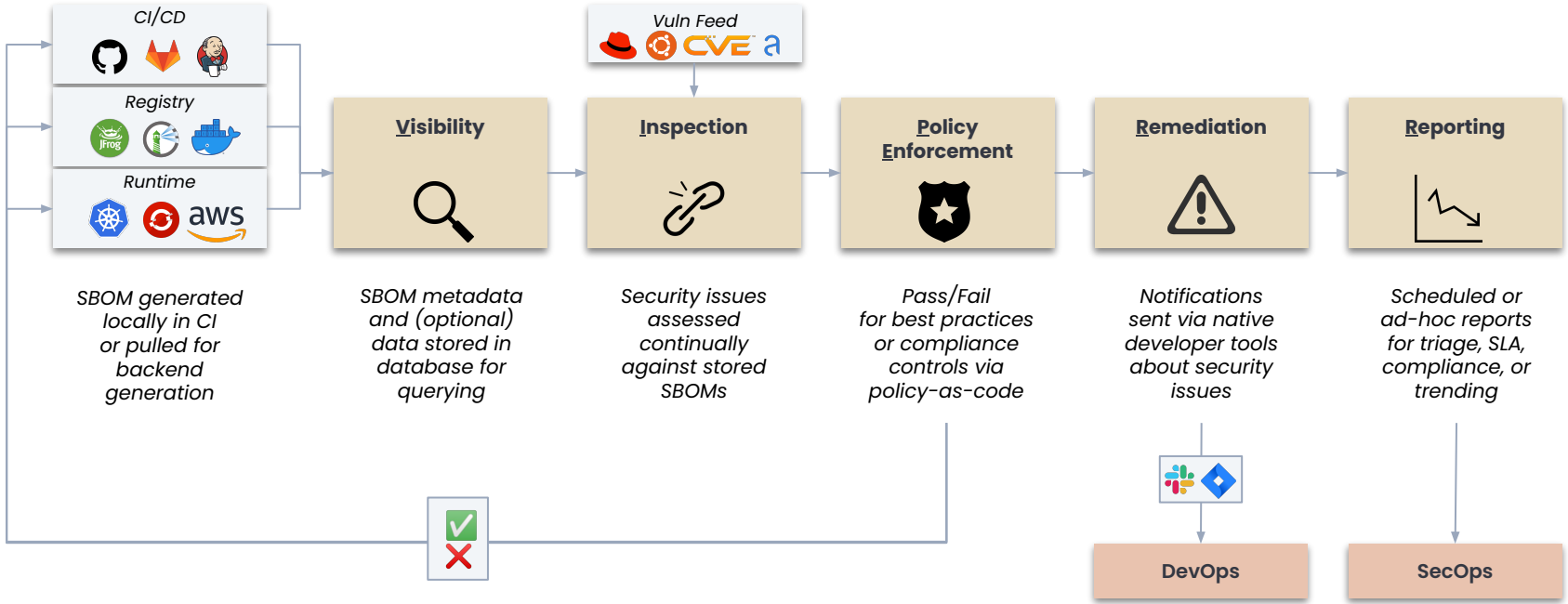
# Anchore Enterprise: Feature Overview



# Anchore Enterprise: Architecture

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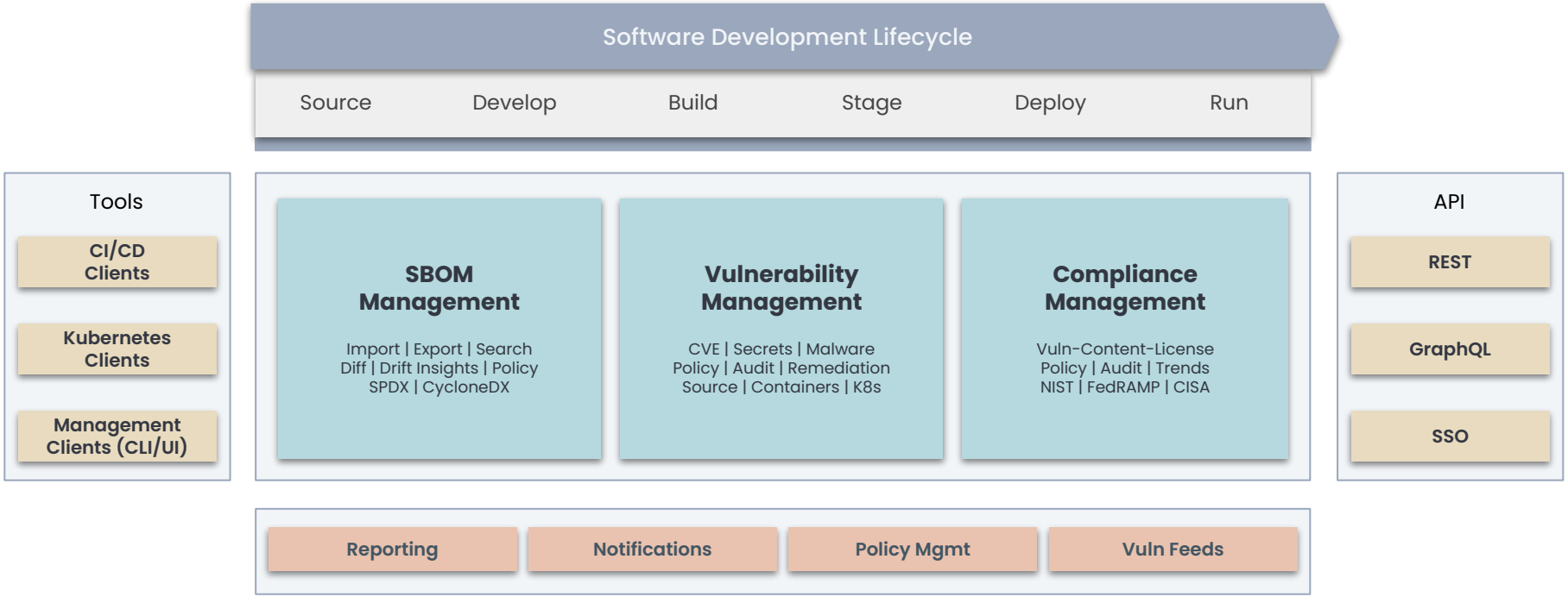
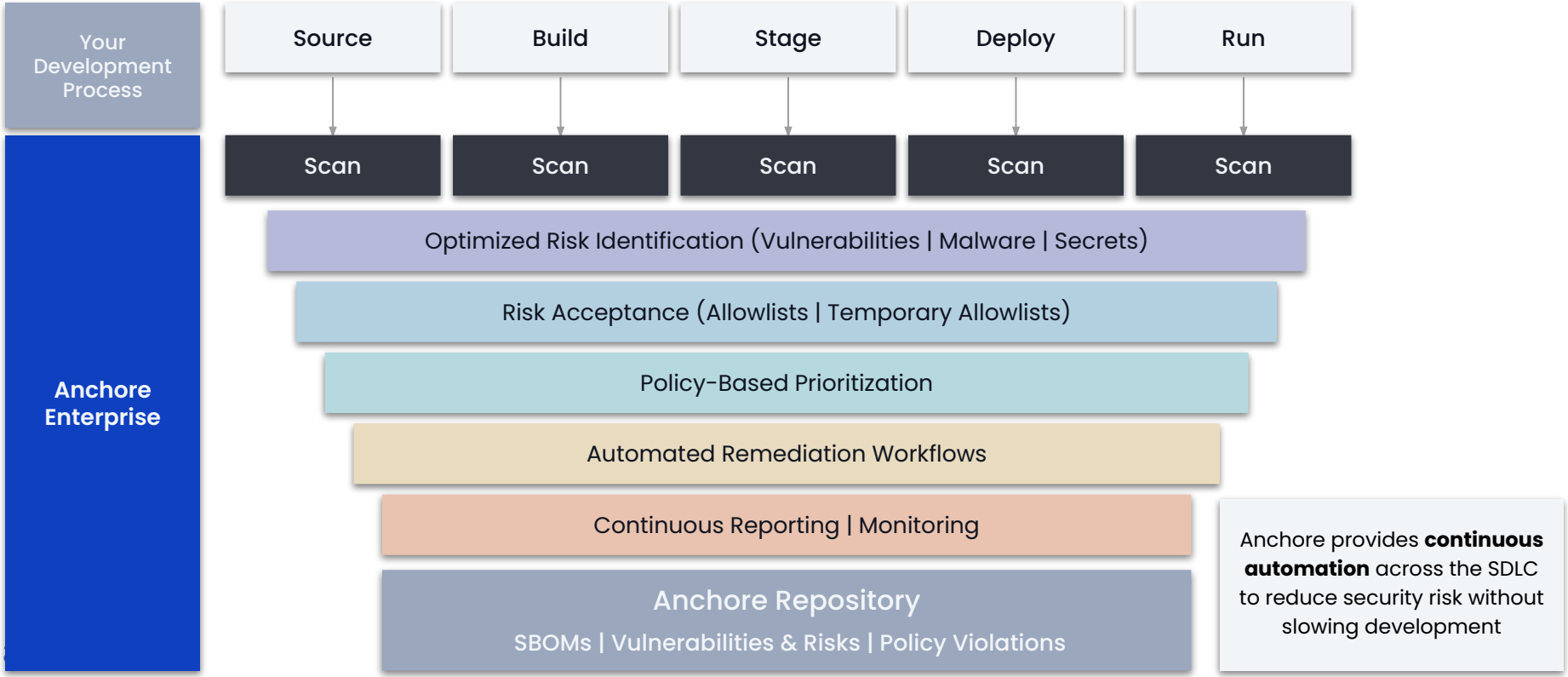
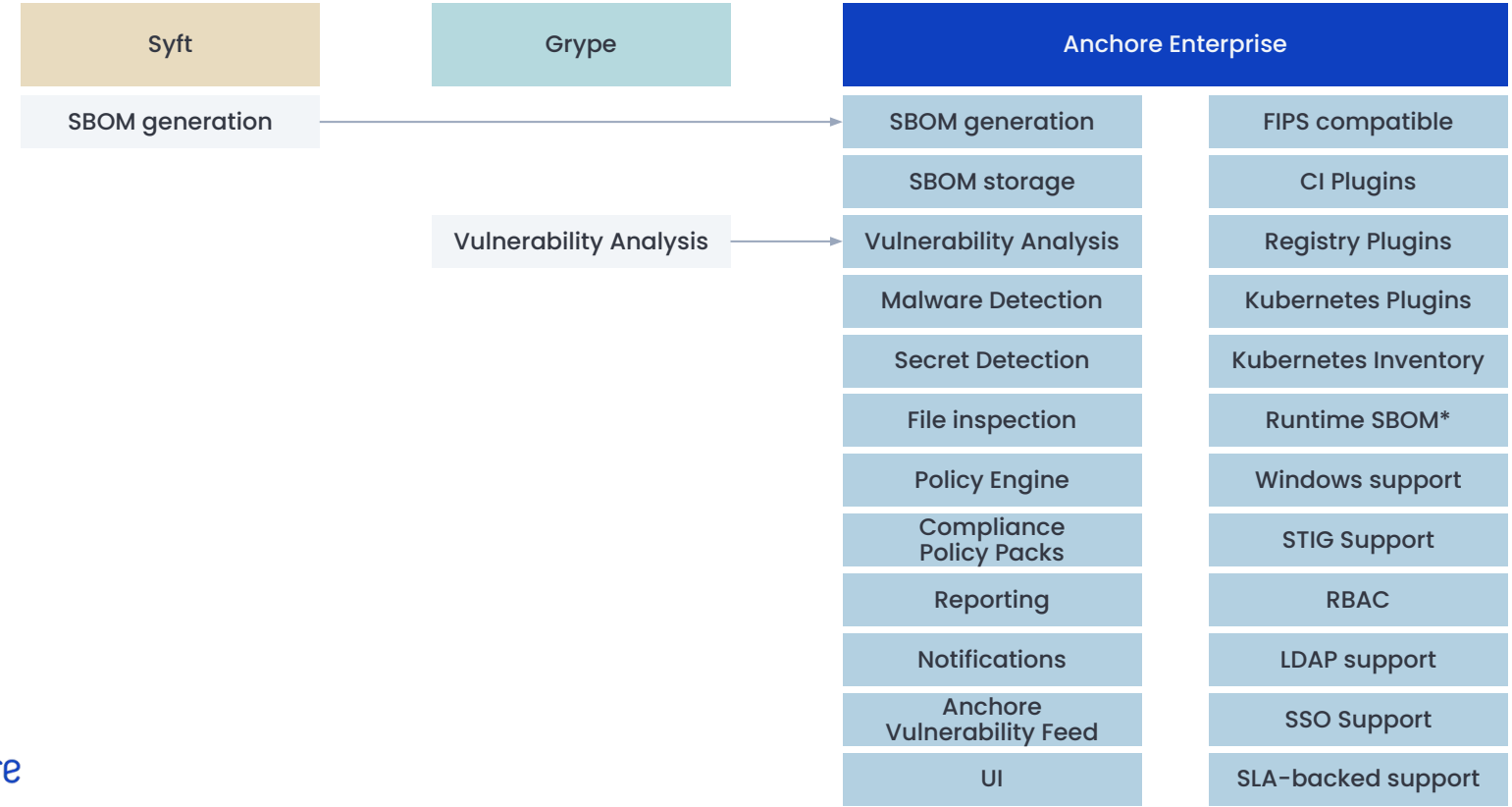
# Product Overview



# Vulnerability Management in the SDLC



# OSS vs Enterprise by feature

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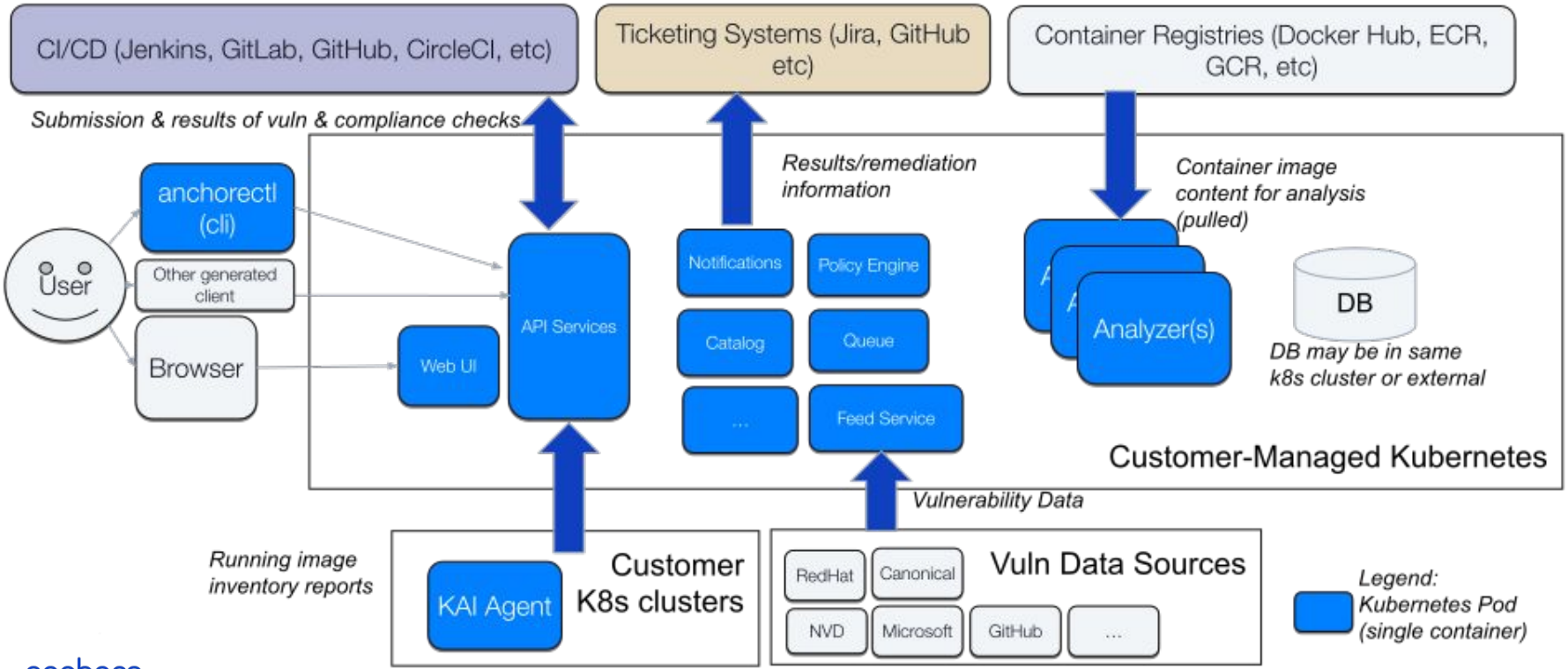
** Q2 2023*

# Architectural Context

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# Thanks!

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# Q&A

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**https://github.com/anchore/syft**

**Download Grype**

**https://github.com/anchore/grype**

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Get an invite to our open source community Slack:
https://anchore.com/slack/

These slides and lab examples archived here:
https://github.com/pvnovarese/2023-09-sbom-workshop