

From Concept to Prototype

Leveraging Generative AI for Rapid Development in an Enterprise

Tapabrata “Topo” Pal

Fidelity Investments



Disclaimers

This presentation is a case study of the Fidelity Investments experience.

It is not an endorsement or recommendation of any vendor, product or service.

Unless otherwise noted, the opinions provided are those of the speaker, not necessarily those of Fidelity Investments or its affiliates.

Fidelity and ITRevolution are two separate companies.

About Fidelity Investments

Headquartered in
Boston,
Massachusetts

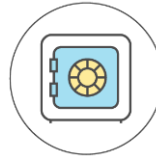
77,000
associates

14
global sites

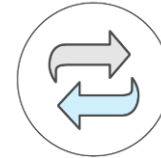
11
countries



\$16.4 TRILLION
assets under administration**



\$6.4 TRILLION
total discretionary assets***



4.3 MILLION
Daily average trades by customers

** Fidelity Internal Information as of June 30, 2025.

*** Includes all Fidelity investment products, such as mutual funds and managed accounts.

Our Priorities

- Improving the financial well-being of our customers
- Leading technology
- Career vitality
- World-class benefits
- Being a trusted partner in local communities
- Sustainability
- Diversity & inclusion

About me

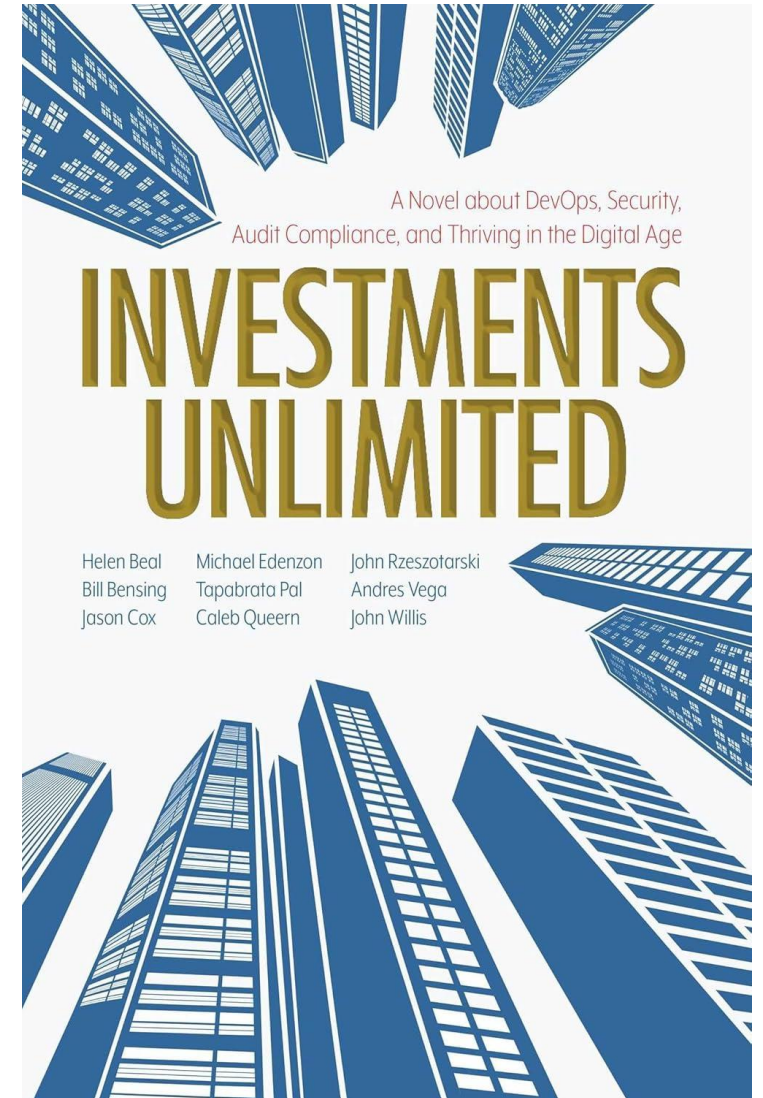
Current

Vice President, Fidelity Architecture and Engineering

- Software Delivery Domain
- Open Source Program Office

Previous

Capital One, Home Depot, Quadramed (Nuance), Circuit City, Academia



Hypothesis

GenAI Coding Assistants can accelerate development, streamline code reviews, enhance test coverage, and support faster delivery cycles.

My use case

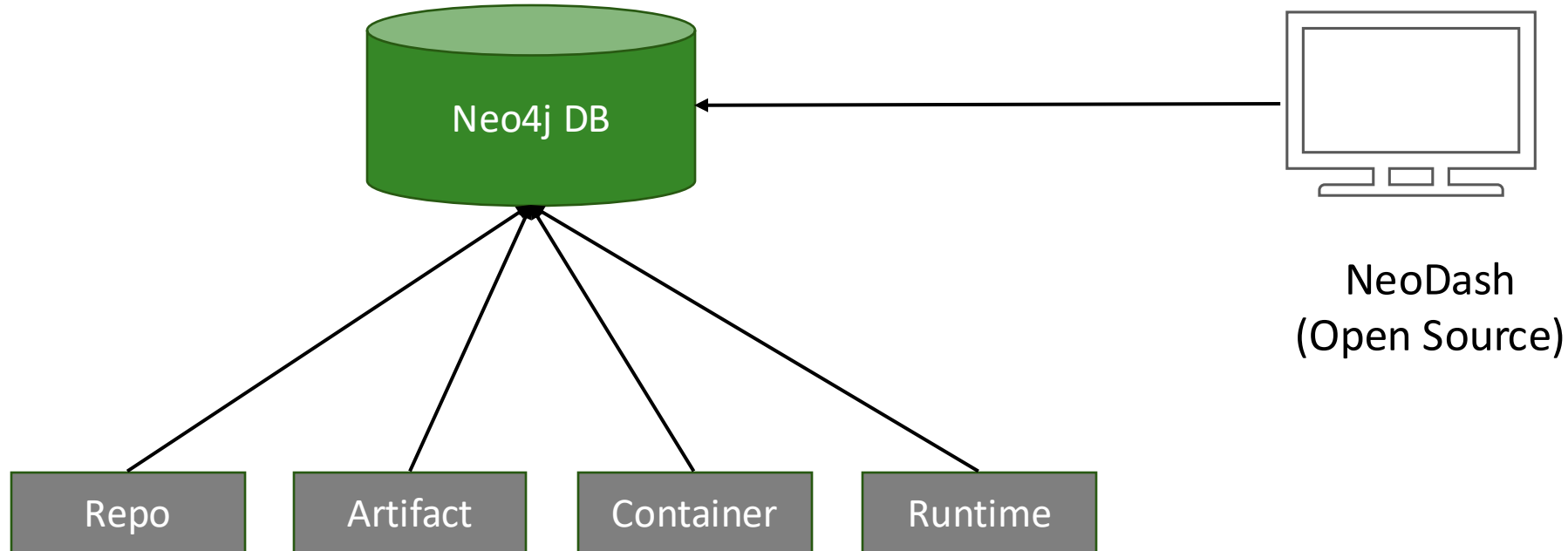
Software Bill of Material Visualization & Analysis

If you're building software, you need to know your components

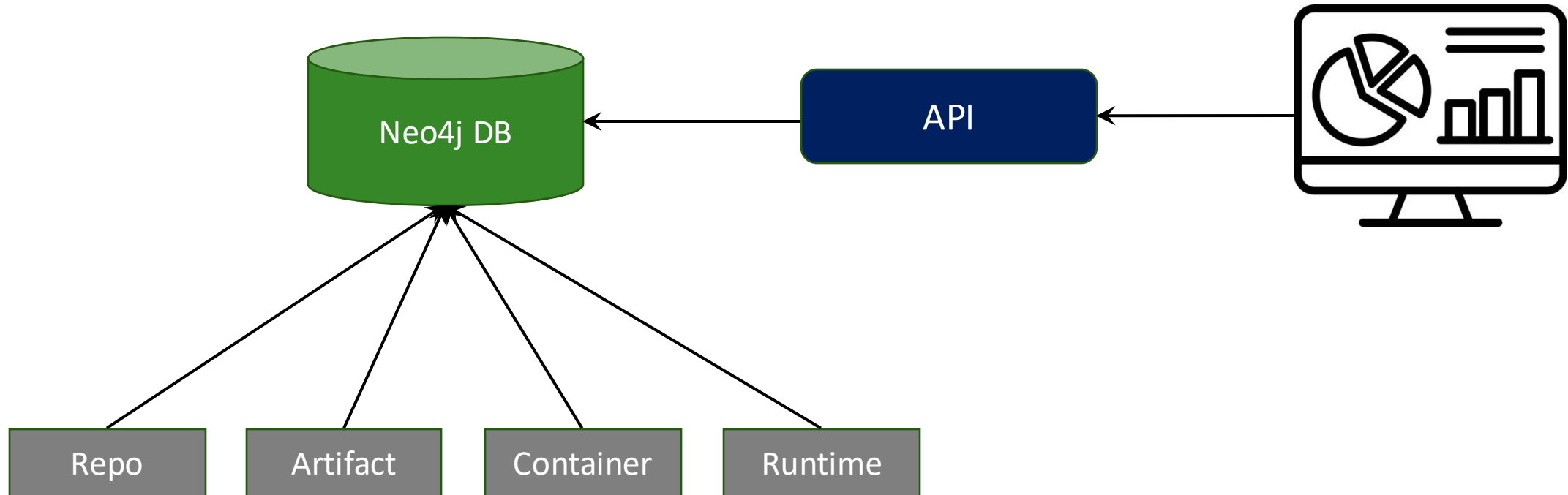
What do I have

- Complete dependency graph and metadata of internally build applications in Neo4j Graph DB
- An amazing team of backend developers
- A tentative dashboard build using NeoDash

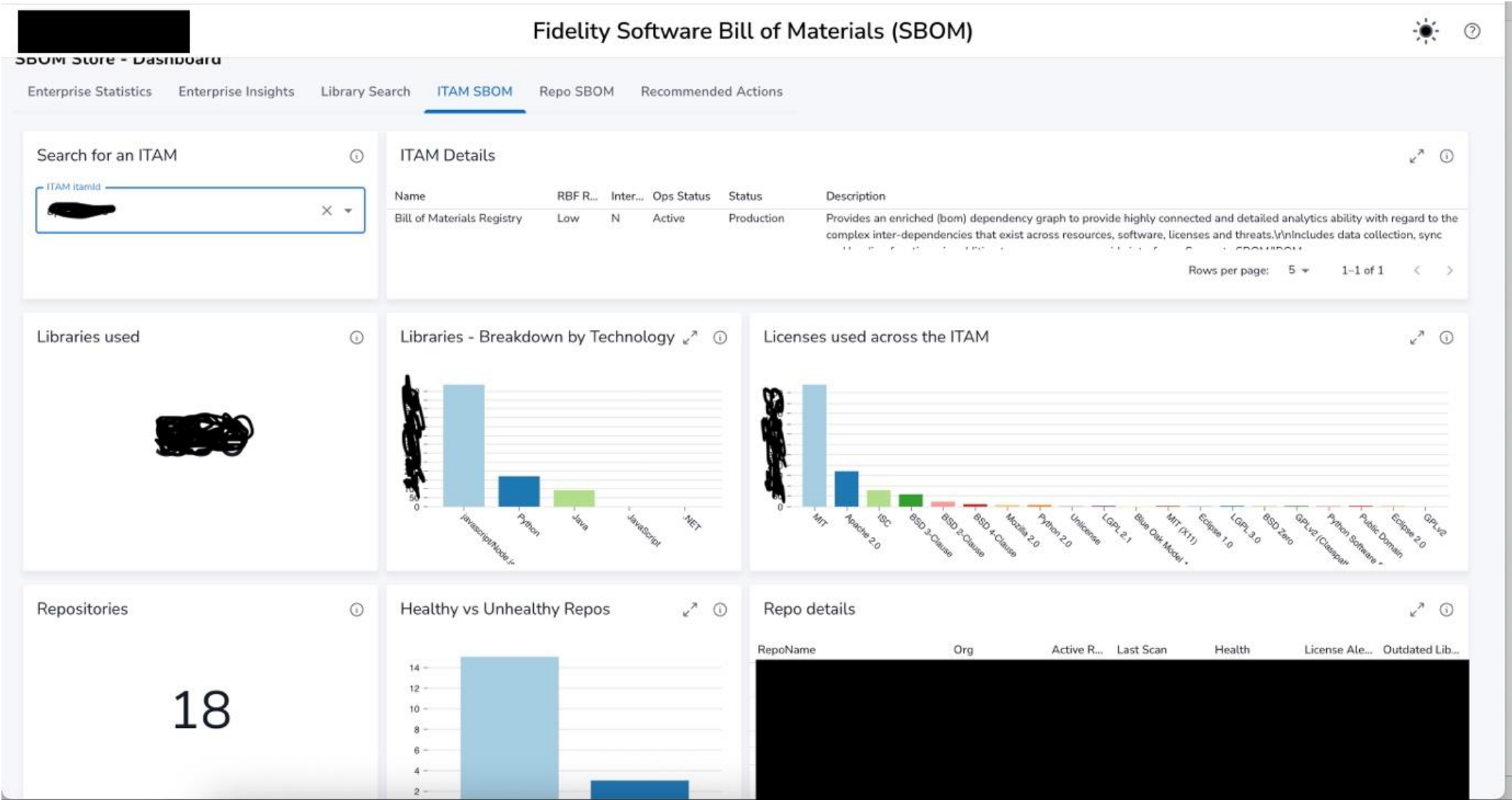
High Level Architecture: What I have



High Level Architecture: What I want



Out of the box NeoDash



Out of the box NeoDash

Fidelity Software Bill of Materials (SBOM)

SBOM Store - Dashboard

Enterprise StatisticsEnterprise InsightsLibrary SearchITAM SBOMRepo SBOMRecommended Actions

Enter the library search term here:

searchtermcommons-collection

Help:

Enter the search term in the box and the tables below will automatically refresh to show the data.

- Clicking the blue box sets that library name as the search term.
- All panels include a maximize and refresh button (top right)
- All panels include a csv download button (bottom left)

Note: Limits are set on the server, if you receive errors, try a narrower term.

Libraries found matching the search term (including total count of uses across all repos)

GroupID	ArtifactID	Version	LibraryName	Type	Description	Usage
org.wso2.orbit.org.apache.commons	commons-collections4	4.4.wso2v1	COMMONS-COLLECTIONS4-4.4.WSO2V1.JAR	Java	This bundle exports packages from common-collections4 library	17
org.wso2.orbit.commons-collections	commons-collections	3.2.2.wso2v1	COMMONS-COLLECTIONS-3.2.2.WSO2V1.JAR	Java		13
org.apache.commons	commons-collections4	4.4	COMMONS-COLLECTIONS4-4.4.JAR	Java	The Apache Commons Collections package contains types that extend and augment the Java Collections Framework.	25,272
org.apache.commons	commons-collections4	4.3	COMMONS-COLLECTIONS4-4.3.JAR	Java	The Apache Commons Collections package contains types that extend and augment the Java Collections Framework.	339
org.apache.commons	commons-collections4	4.1	COMMONS-COLLECTIONS4-4.1.JAR	Java	The Apache Commons Collections package contains types that extend and augment the Java Collections Framework.	696

Rows per page: 51-5 of 55

ITAMs owning Repositories using Libraries

BU	ITAM	Name	RBF Rating	Internet Accessible	Ops Status	Status	ReposImpacted
		IDS - Insight Desktop	Medium	N	Active	Production	1
		Armenta Theatre - Cloud	Medium	N	Active	Production	1

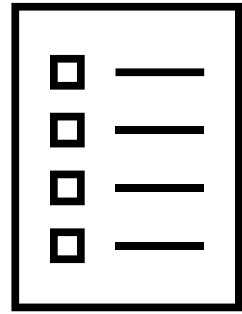
My first experiments

- How do I get schema of my data
- Help me with cypher queries
- Can you optimize complex queries

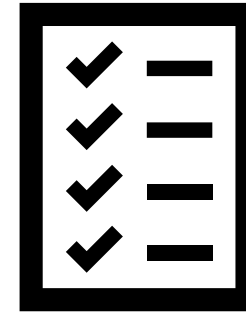
My second experiment



My wish list document



Functional & non-functional
Requirements



Detailed task list

Results after 5 days of Vibe Coding

- React frontend, Node/TypeScript backend APIs
- Code for SSO integration
- Feature toggles
- Enterprise Standard Logging
- End to end Request Tracing, Correlation
- Performance monitoring hooks
- Unit and end to end test suite > 80% coverage
- Zero linting and code quality issues
- Docker file, CI pipeline, partial CD pipeline
- Architecture diagrams in markdown format
- And a few functional bugs!

SBOM Dashboard

Software Bill of Materials Overview and Risk Assessment

Data Source: SBOM Registry

Last updated: 1:14:50 PM

Refresh

Total ITAMs

High Risk Libraries

License compliance risk

License Compliance

Low risk libraries

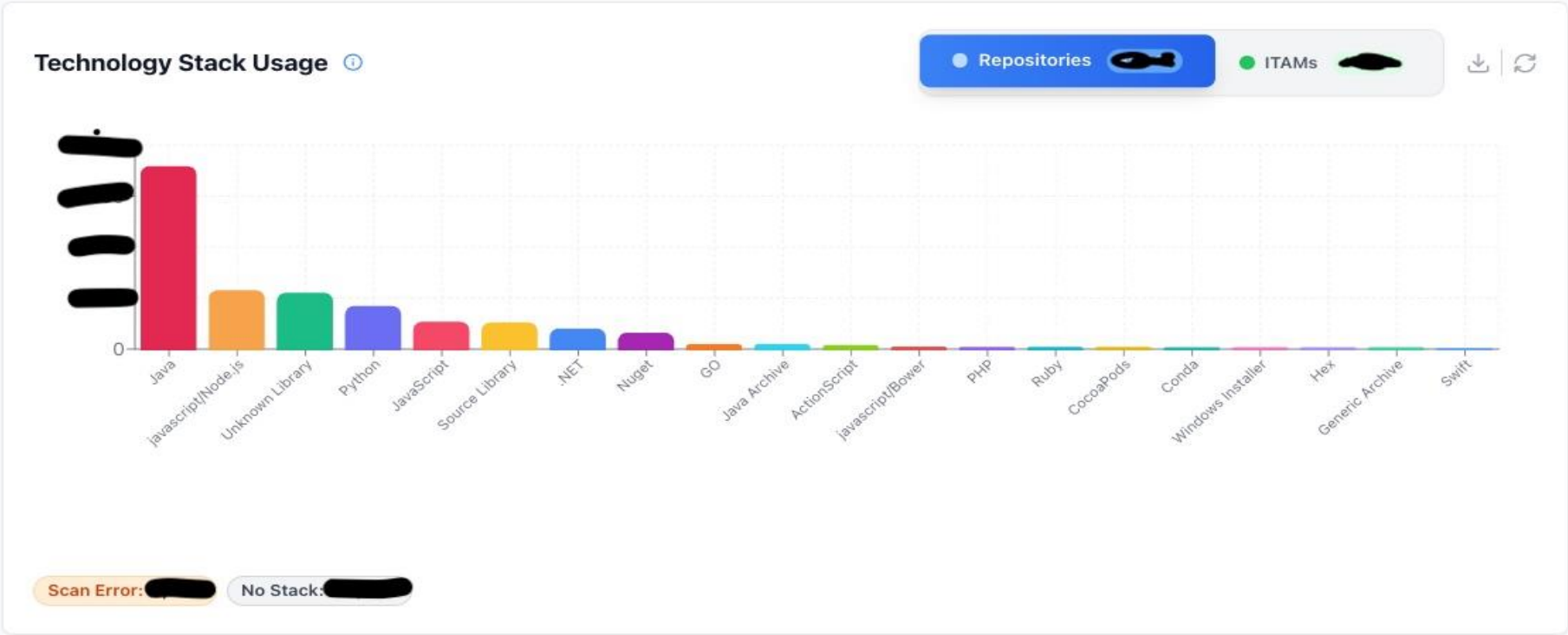
Vulnerabilities

high severity

Technology Stack Usage

Vulnerability Trends

License Risk Distribution





SBOM

Dashboard



Dashboard



ITAM Search



Library Search



License Risk



Graph



Group Analysis

Software Bill of Materials Dashboard

Welcome Tapabrata Pal

SBOM Dashboard

Software Bill of Materials Overview and Risk Assessment

Data Source: SBOM Registry

Last updated: 1:14:50 PM

Refresh



Total ITAMs



High Risk Libraries



License compliance risk



License Compliance



Low risk libraries



Vulnerabilities



Technology Stack Usage

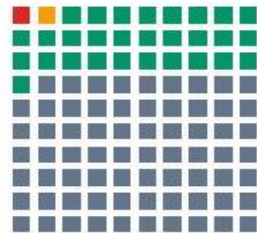
Vulnerability Trends

License Risk Distribution



License Risk Distribution

License risk assessment across your software libraries



Total Libraries



High

Libraries with restrictive licenses



Medium

Libraries with moderate restrictions



Low

Libraries with permissive licenses



Unknown

Libraries with unidentified licenses



Risk Assessment Summary

Compliance Score:



Action Required:



Unreviewed:



Search > Bill of Materials Registry

← Bill of Materials Registry

Application - ap156276

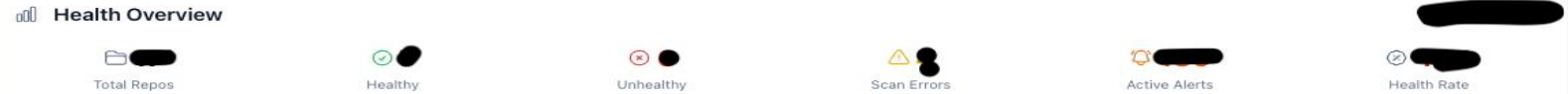
Share Export

ID: [REDACTED] Name: Bill of Materials Registry Category: Application Type: [REDACTED]

Cost Center: [REDACTED]

Lifecycle: Production Ops Status: [REDACTED] RBF Rating: [REDACTED] Internet Accessible: [REDACTED]

Description: Provides an enriched (bom) dependency graph to provide highly connected and detailed analytics ability with regard to the complex inter-dependencies that exist across resources, software, licenses and threats.\r\n\r\nIncludes data collection, sync and loading functions, in addition to secure consumer-side interfaces. Supports SBOM/IBOM.



Repositories Dependencies Vulnerabilities License Compliance Recommended Actions

Search repositories... All Health All Scan Status Sort by Name Ascending 25 per page Export

Organization/Repository	Last Scanned	Scan Status	Health	Alerts
> [REDACTED]	May 22, 2025, 01:4...	✓	✓	0
> [REDACTED]	Aug 28, 2025, 04:4...	✓	✓	0
> [REDACTED]	Nov 29, 2024, 01:2...	✓	✓	0
> [REDACTED]	Jul 25, 2025, 05:3...	✗	⚠	0
> [REDACTED]	Aug 15, 2025, 01:4...	✓	⚠	1
> [REDACTED]	Jun 20, 2025, 08:1...	✓	⚠	5
> [REDACTED]	Jul 25, 2025, 10:53...	✓	✓	0
> Fidelity-Green/ap156276-license-collector	Jul 25, 2025, 10:54...	✓	⚠	2



Library Search

Search for open source libraries by **artifactId**. View details, license, vulnerabilities, and usage across repositories and ITAMs.

commons-collections4

commons-collections4-4.1

commons-collections4-4.2

commons-collections4-4.4

**SBOM**

Dashboard



Dashboard



ITAM Search



Library Search



License Risk



Graph



Group Analysis

Software Bill of Materials Dashboard

Welcome Tapabrata Pal

[← Back to Search](#)

Library Search Results



Clear Selection

1 selected

[Show Current Usage](#)[Show Past Usage](#)**commons-collections4**

org.apache.commons

Java

Apache 2.0

Apache-2.0

4.5.0 ▾

**commons-collections4**

org.wso2.orbit.org.a...

Java

Apache-2.0

4.4.wso2v1 ▾

Usage Report Options

Do you want the usage report for **ALL versions**
of the selected libraries,
or just the **selected versions**?

[All
Versions](#)[Selected Versions
Only](#)



SBOM

Dashboard



Dashboard



ITAM Search



Library Search



License Risk



Graph



Group Analysis

Software Bill of Materials Dashboard

Welcome Tapabrata Pal

[← Back to Library Details](#)

Library Current Usage Report

Library Usage Report: This page provides a summary and detailed view of library usage across business units, ITAMs, repositories, and dependencies.

1 Libraries

Total Usages: 4 Unique BU: 1 Unique ITAM: 1 Unique Repos: 4 Applications: 4 Products: 0 Product Lines: 0

Filter by BU, ITAM, ITAM Class

Sort by: BU

↑ Asc

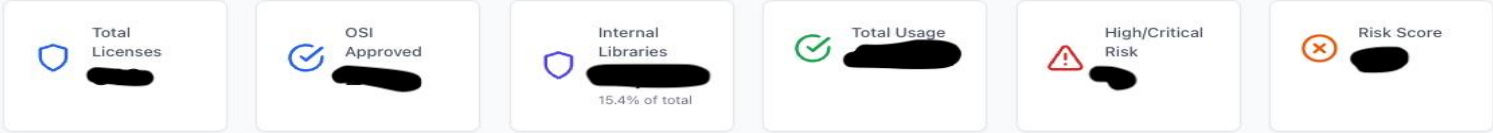
Export CSV

Export Excel

BU	ITAM	Class	Ops Status	Lifecycle Status	Internet Accessible	RBF Rating	REPOSITORY	ACTIVE REPO	LAST SCAN	
[REDACTED]		Application	Active	Concept	No	High	[REDACTED]bt-common	true	3/13/2025, 5:02:45 PM	org.wso2
[REDACTED]		Application	Active	Concept	No	High	[REDACTED]-rest-retirementacctfee	true	3/13/2025, 5:01:19 PM	org.wso2
[REDACTED]		Application	Active	Concept	No	High	[REDACTED]estproxyservice	true	11/30/2024, 12:34:07 AM	org.wso2
[REDACTED]		Application	Active	Concept	No	High	[REDACTED]-rest-oeinvestor	true	3/13/2025, 5:01:01 PM	org.wso2

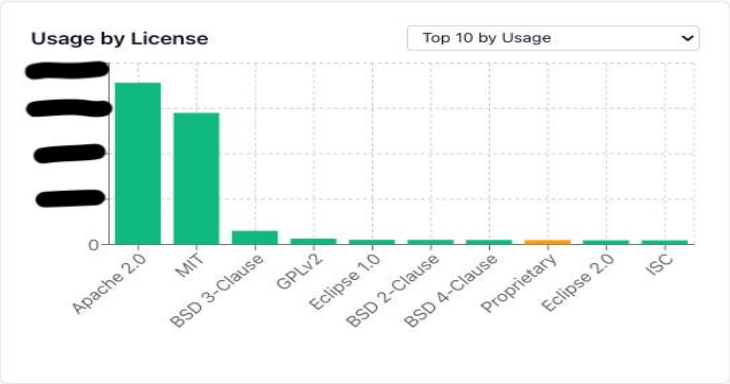
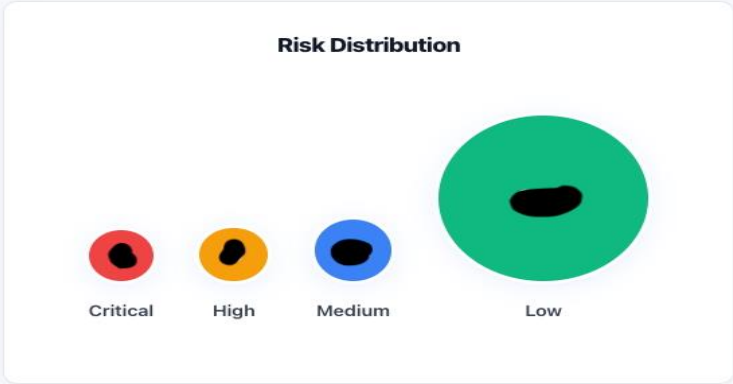
License Risk Assessment

Analyze and manage license risks across your software portfolio



Search licenses...

All Risk Levels



Apache 2.0

Low

Restrictions

Obligations

Compatible With

Libraries

Repositories

MIT

OSI Approved

Low

Very permissive license with minimal restrictions

OSI Name: MIT License

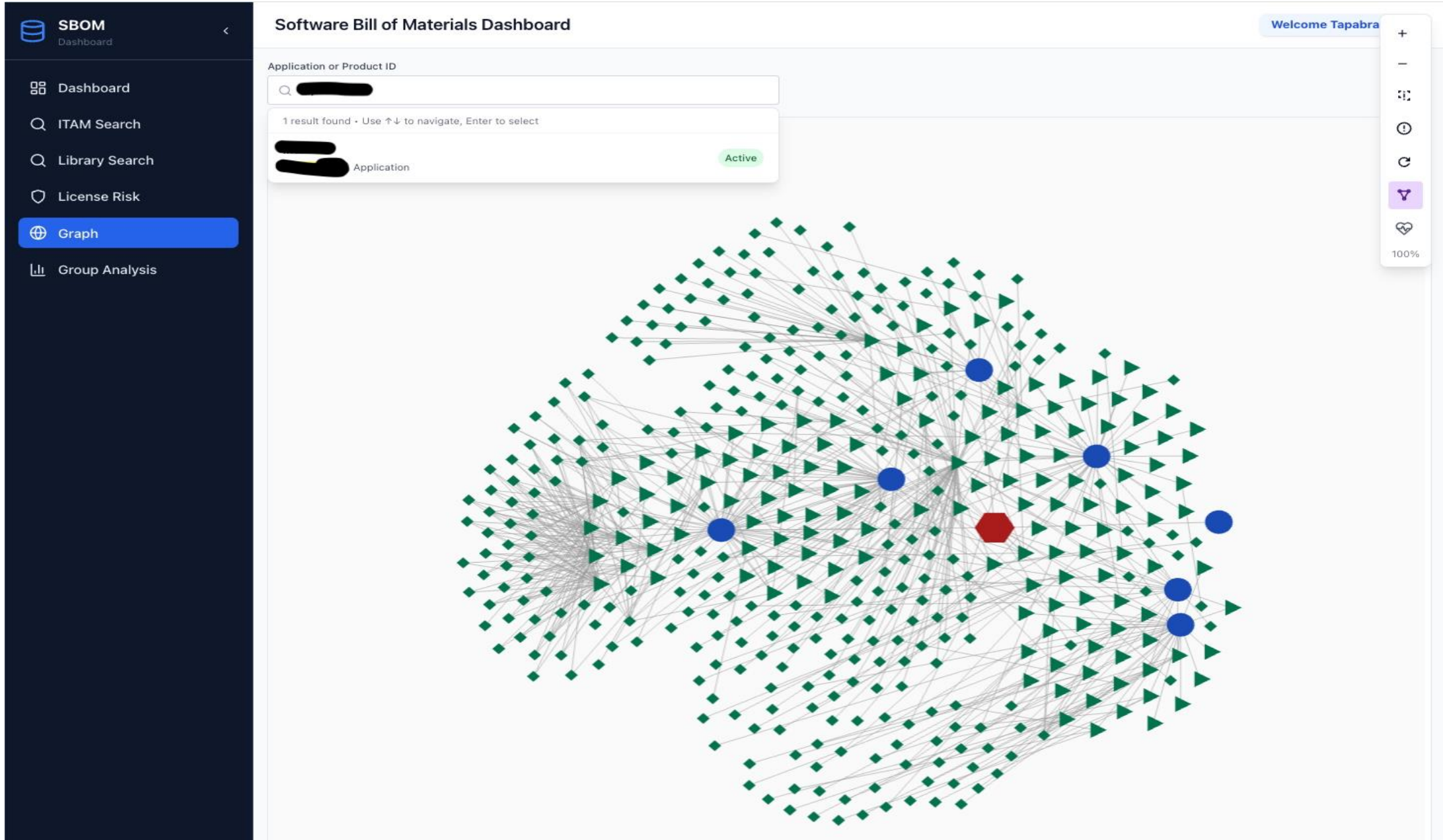
Restrictions

Obligations

Compatible With

Libraries

Repositories



Dashboard

ITAM Search

Library Search

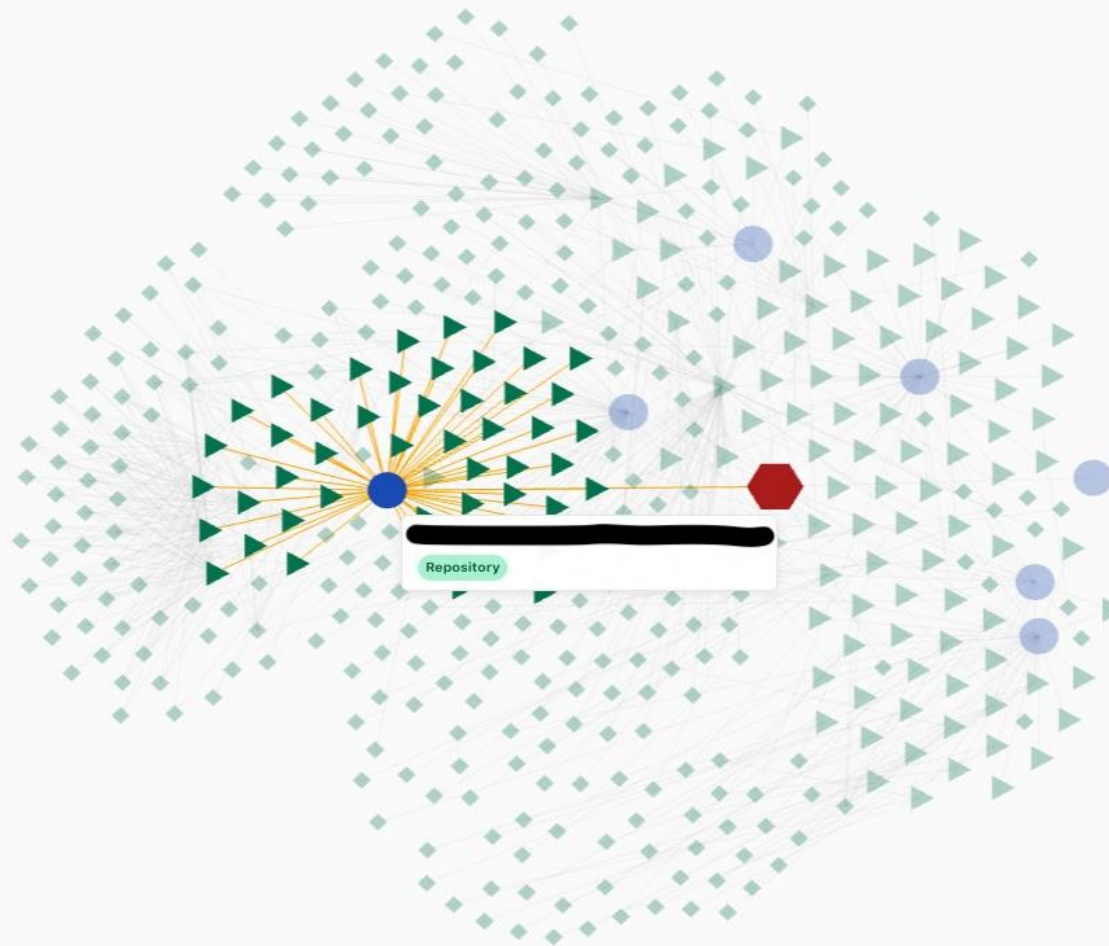
License Risk

Graph

Group Analysis

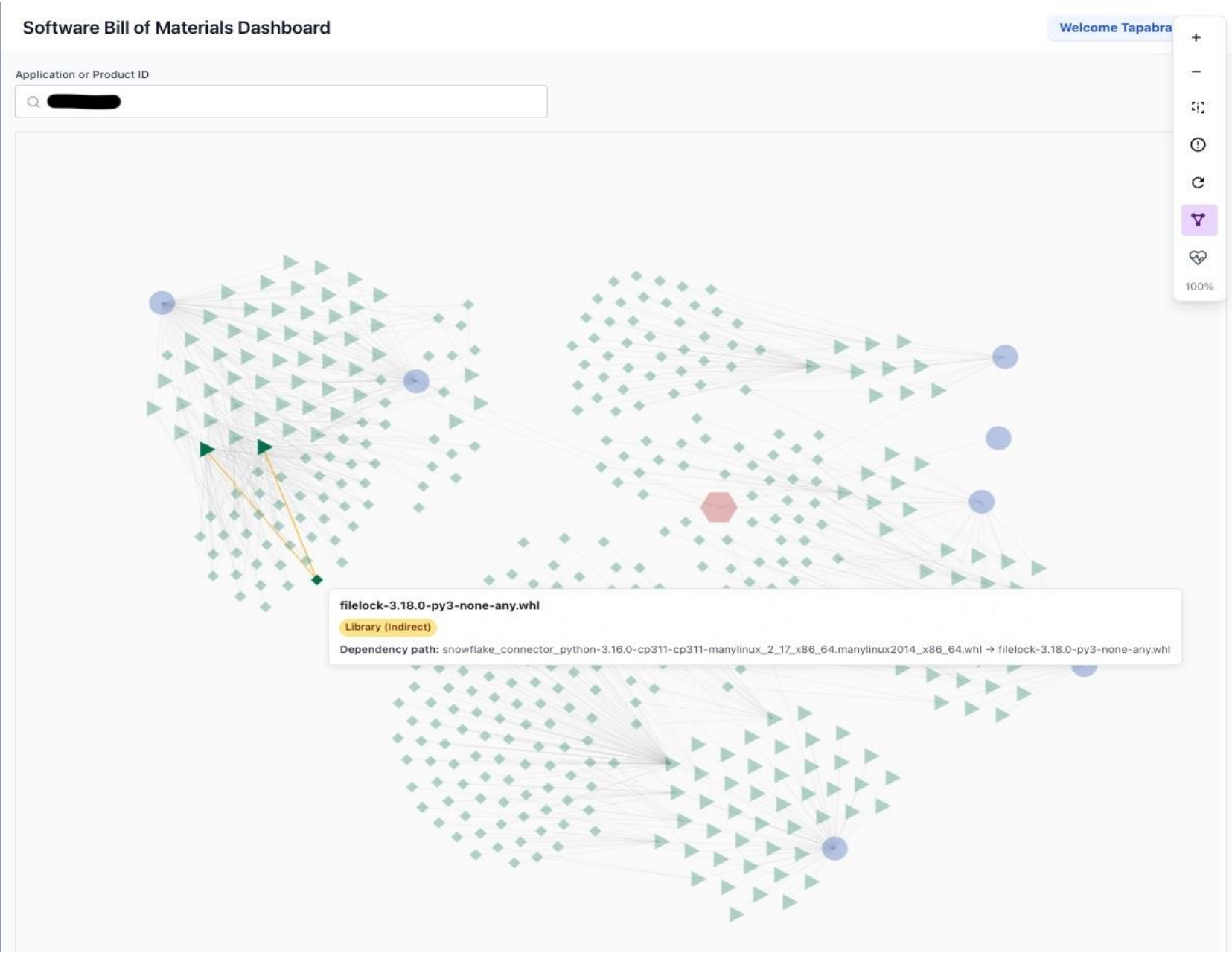
Application or Product ID

Q [REDACTED]



Repository

+
-
[Full Screen Icon]
[Info Icon]
[Refresh Icon]
[Filter Icon]
[Heart Icon]
100%



How large is this project

- **API Server (Backend):** ~36,606 lines of TypeScript/Node.js
- **Web App (Frontend):** ~30,515 lines of React/TypeScript
- **270 source code files** across the entire project

How good is this project

This project demonstrates (according to GenAI):

- **Senior+ developer skills**
- **Full-stack expertise**
- **Enterprise software experience**
- **Security domain knowledge**
- **DevOps and production readiness**

Bottom line: This is the kind of project that gets you interviews at FAANG companies and demonstrates you can architect and build production-grade enterprise software. Definitely brag about it!

My learning as a Developer

- Do not 100% trust your AI coding agent
- Use all the scanners, linters, analysis and verification
- Use multiple models all the time
- Human must be the decision maker
- Never use the same model generate code and test cases
- Use version control and commit very frequently

What I learnt as a Technology Leader

- AI coding agents are here
- Monitor usage of AI coding agents
- Double down on core DevOps capabilities
- Double down on your security, risk and compliance capabilities
- Embrace the change

CAUTION: Vibe coding is addictive



Help I am looking for

- What is your POV on GenAI Coding Assistant
- What controls do you have or planning to have
- What are your major use cases

This community helped bring DevOps to the enterprises through sharing

Let's do it again