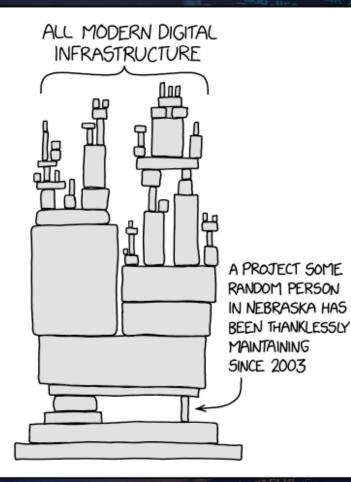




### **Intentional Supply Chain Exploit**

- Two researchers from the University of Minnesota.
- Intentionally submitted malicious code into Linux Kernel.
- Permanently banned from future submissions.

Trust is difficult to gain, even harder to prove, and easy to destroy in an instant...



98% of code bases, even proprietary, now contain opensource software.

How 'bout security?

73% of code bases have at least one license issue. 67% of code bases contain at least one license conflict.

The average code base contains 445 opensource components.

### What (and who) is in our software?

How many other malicious contributions have been injected into the packages we're pulling into our systems and applications? What code is in our systems? And, who developed it?

75% of code bases contain FOSS with unpatched vulnerabilities 49% of code bases with open-source contain high-risk vulnerabilities. 82% of code bases contain opensource components that are at least four years out of date.

43% contain 10+ year old vulnerabilities.

https://xkcd.com/2347/

2019 Open Source Risk and Security Analysis (OSSRA) report

# Pushwoosh

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### irror mod.use x The Story... Our Exposure... 9 minute read · November 16, 2022 10:28 AM MST · Last Updated 2 months Home > News > Security https://www.facebook.com > ... > Pushwoosh ago Pushwoosh | Kensington MD - Facebook Russian Code Found in US Army, **EXCLUSIVE Russian software disguised as** Pushwoosh, Kensington, Maryland. 738 likes · 3 talking about this. The top mobile-inspired American finds its way into U.S. Army, CDC customer engagement platform trusted by 80000 clients from ... **CDC** Apps apps https://www.linkedin.com > company > pushwoosh Pushwoosh - LinkedIn

U.S. Govt. Apps Bundled

**Russian Code With Ties to** 

Pushwoosh. IT Services and IT Consulting. Kensington, Maryland 978 followers. Mobileinspired customer engagement platform for high achievers.

https://eintaxid.com > company > 352507621-pushwoo.

EIN 35-2507621 - Pushwoosh Inc., Kensington, Maryland

Pushwoosh Inc. is a small employer located at Kensington, Maryland. The employer identification number (EIN) for Pushwoosh Inc. is 352507621.

### embedded in 8,000 mobile apps. Mobile Malware Developer By Matthew Humphries November 14, 2022 November 28, 2022

Everyone thought Pushwoosh was a US company, not a

Russian entity operated from Siberia with its code

🗧 🔍 😫 💭 GitHub - Pu	ishwoosh/pushwoosh× +						$\sim$	
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## **NOT** an American Company

### 

## The Missing Calculation? Software Trust Intelligence and Analytics

login

-bala

mrFranklin



.Y:['Mark-SS']['

Using open-source intelligence to understandY:['Matthalp'][' community participants, their credentials, ationships, interactions, and source code content to establish trust in open-source software. Y:['Mr-Leshiy']

Contributor Geolocation Flagging

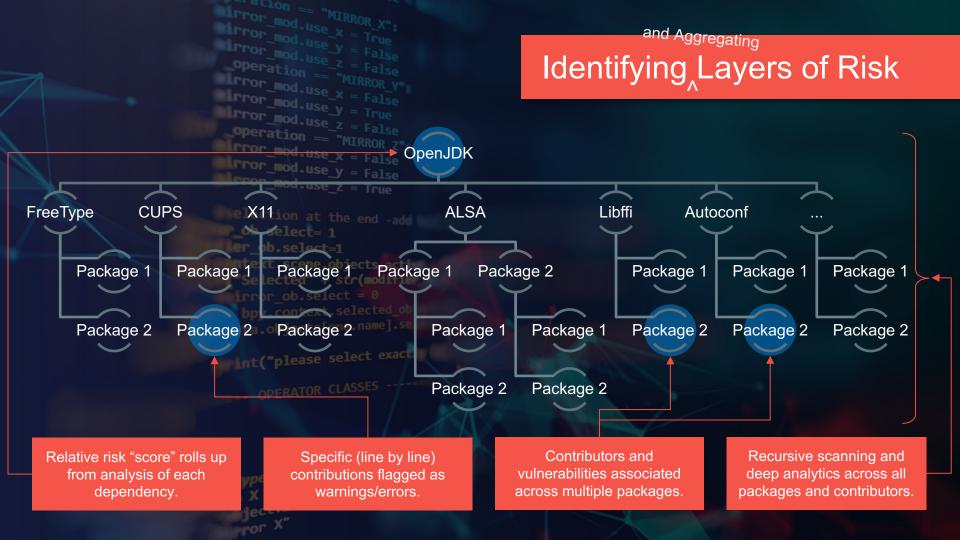


Contributor Relationships by Degree

caralabe

## .Y:['PascalDieric

Contributor Alternate ID Analysis



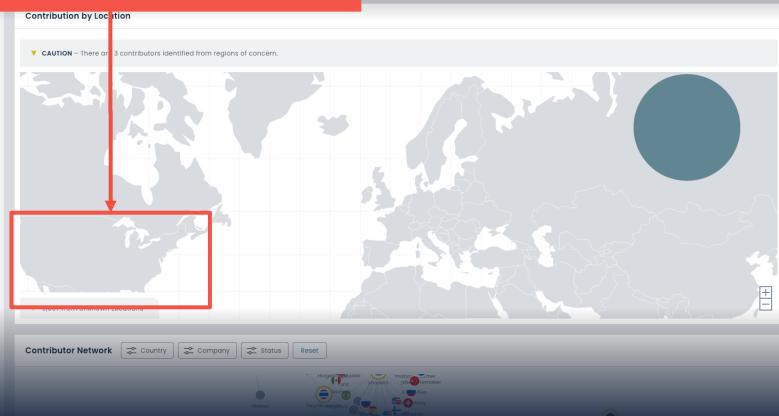
## Back to Pushwoosh...

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darkskytechnology/welcome	WARNING OVERAL SPIRITHEN			
openssi/openssi	Status Overview			
arco-design/arco-design	CAUTION – Active Contributors: 6 contributor accounts associated with this repository are no longer valid, including 2 that do not have a	likely substitute identified.		
mit-II/CEP	CAUTION – Contribution by Location: There d 3 contributors identified from regions of concern.			
flightaware/Pgtcl	WARNING - The Pushwoosh Inc. company from Russia has significant influence over this project.			
ousret/charset_normalizer				
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qos-ch/slf4j@v\_1.7.30

OpenXT/meta-selinux

## No Contributions in America



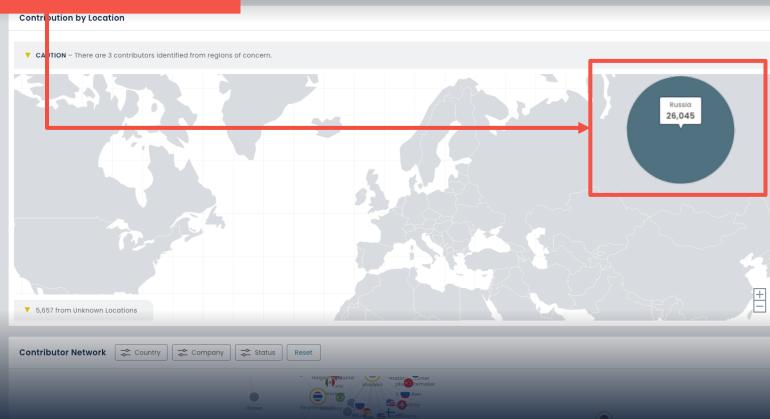
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OpenXT/meta-selinux

## Thousands in Russia



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## With Russian and Hidden Influencers

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A method for asynchronously collecting and analyzing OSINT from hundreds (or thousands) of sources

## Preserve Historical Contributions

count: key:

Enhanced Contributor Data

source:

**Open Source Package Intelligence** 

Enhanced Data Security & Control



A method for asynchronously collecting and analyzing OSINT from hundreds (or thousands) of sources

Operation == "MIRROR\_Z"
Irror\_mod.use\_x = False
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Irror\_mod.use\_z = True

Collectors

vject.mirror\_mirror\_x

WOT X"

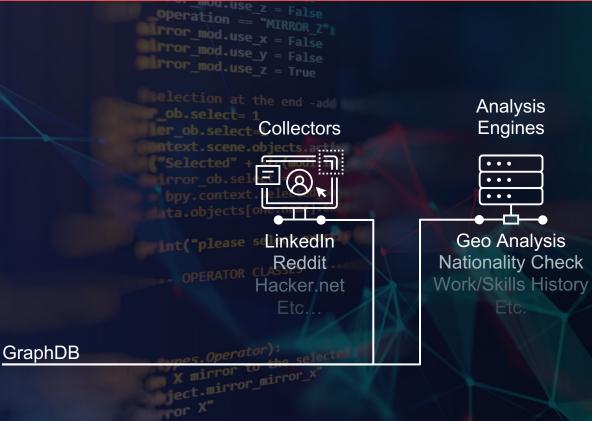




Services that automatically scale up and down in clusters based on load.

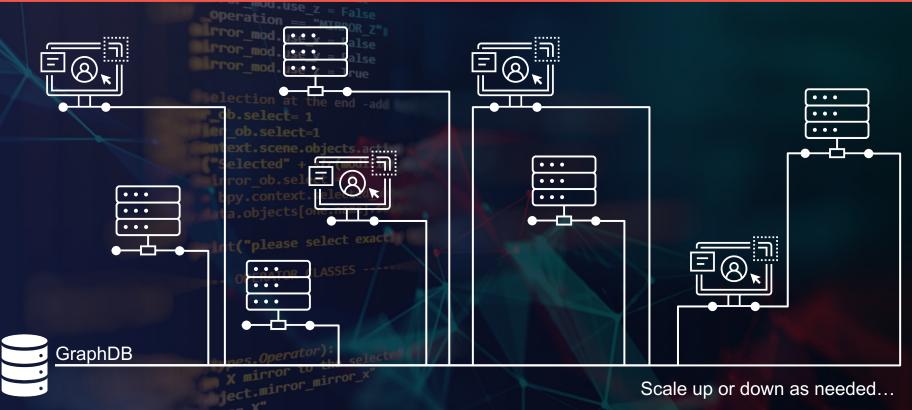


A method for asynchronously collecting and analyzing OSINT from hundreds (or thousands) of sources





A method for asynchronously collecting and analyzing OSINT from hundreds (or thousands) of sources



### color contributor/(centrib) on more package or /package to maning package /package/(part) on show any of /package/(part) one contribution any of /package/(part) one contribution any of /package/(part) one contribution any of

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## **Collection and Analysis**

## **Preserve Historical Contributions**

**Enhanced Contributor Data** 

Pulling history from pre-GitHub packages (i.e., capture and merge contributors from Source Forge)

Open Source Package Intelligence

Data Security and Control



## **Preserve Historical Contributions**

Pulling history from pre-GitHub packages (i.e., capture and merge contributors from Source Forge)

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## Preserve Historical Contributions

count: key: location: source:

## Enhanced Contributor Data

Contributor commit date range, signing details, repo popularity, activity, etc.

Open Source Package Intelligence

Data Security and Control

### count: kev: location: source:

## **Enhanced Contributor Data**

Contributor commit date range, signing details, repo popularity, activity, etc.

795,818 from Unkno

### u. Use z = Falso

### Summarv ampl/gsl@v2.5.0 View on GitHub 17 Overall Status **Overall Sentiment** GOOD NEUTRAL Software Bill of Materials (SBOM) Lines of Code Added/Removed Active Contributors Contribution by Lo <?xml version="1.0" encoding="UTF-8"?><born Active | V Dead Accts | Influence serialNumber="urn:uuid:bcb6253e-2e18-45c0-873f-f3e2d8ccc3d3" Added Removed version="1" xmIns="http://cyclonedx.org/schema/bom/1.4"><metadata> # Contrib Bigs Risk <timestamp>2023-02-01T14:52:21.016727+00:00</timestamp><tools><tool> \_victor.zverovich\_ 751,351 🖓 <vendor>CycloneDX</vendor><name>cyclonedx-bom</name> <version>3.10.1</version></tool><vendor>CycloneDX</vendor> fdabrandao 513.017 <name>cyclonedx-python-lib</name><version>3.1.5</version> \_kgt\_ <externalReferences><reference type="build-system"> 44,066 <url>https://github.com/CycloneDX/cyclonedx-python-lib/gctions</url> \_RobertPancoast77\_ </reference><reference type="distribution"><url>https://pypi.org/project 330 /cyclonedx-python-lib/</url></reference><reference \_patrice\_ type="documentation"><url>https://cyclonedx.github.io/cyclonedx-python-46 lib/</url></reference><reference type="issue-tracker"> dilawar <url>https://aithub.com/CvcloneDX/cvclonedx-pvthon-lib/issues</url> 26 </reference><reference type="license"><url>https://github.com/CycloneDX \_ieremie.dumas\_ /cyclonedx-python-lib/blob/main/LICENSE</url></reference><reference 24 type="release-notes"><url>https://github.com/CycloneDX/cyclonedxbrcha python-lib/blob/main/CHANGELOG.md</url></reference><reference 14 type="ycs"><url>https://aithub.com/CycloneDX/cyclonedx-python-lib</url> martyngigg </reference><reference type="website"><url>https://cyclonedx.org</url> 2 </reference></externalReferences></tool></tools></metadata> nicobako 1 <components><component bom-ref="2b58d5b1-dc5b-4cd8ad64-7df63f4ed5be" type="library"><author>Kenneth Reitz</author> <name>certifi</name><version>2022.12.7</version><licenses><license> <name>MPL-2.0</name></license><license><name>Mozilla Public License 2.0 (MPL 2.0) </name> </license> </licenses> <purl>pkg:pypi /certifi@2022.12.7</purl></component><component bom-ref="9b07d9cc-05a9-4091-8efb-fc92fa253ef4" type="library"><author>Ahmed TAHRI @Ousret</author><name>charset-normalizer</name> 200K 500K 600K 800K Download Cyclone DX

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1 "Menlo Park, CA" "professional" 1 "Belarus" "professional"

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source: count: 1 location: "United States" source: "professional"

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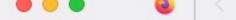


Versioning, issues, popularity, timezones, and signing

**Data Security and Control** 



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Versioning, issues, popularity, timezones, and signing

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## Open Source Package Intelligence

description:	"GNU General Public License V3.0"
name:	"gpl-3.0"
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isFork:	false
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primaryLanguage:	"C"
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firstCommit:	"2016-06-14 06:25:12 +0000"	
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linesAdded:	5128	
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### timeZoneCount: 3



## **Open Source Package Intelligence**

Versioning, issues, popularity, timezones, and signing

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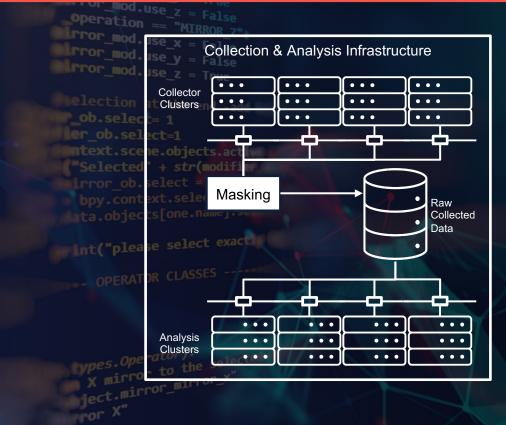
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## **Data Security and Control**

Properly handling and protecting personally identifiable information (PII)







## The Solution?

TOP I



### **Preventing Supply Chain Exploits**

- Analytics can help flag unusual check-ins for analysis.
- Unusual developer activity can trigger deeper analysis.
- Once caught, bad actors will forever be flagged.
- All future code will be labeled as suspect until trust is reestablished.

Bad actors cannot hide (for long)...

Their "signatures" will trigger warnings and errors, preventing intentionally or accidentally submitted code vulnerabilities and eventual system exploit.

Finally. *rust* in Open Source

INFO@DARKSKYTECHNOLOGY.COM

**DARK SKY** TECHNOLOGY

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