CLOUDNATIVE SECURITYCON

NORTH AMERICA 2023

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The Next Steps in Software Supply Chain Security

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Software Engineer, Google

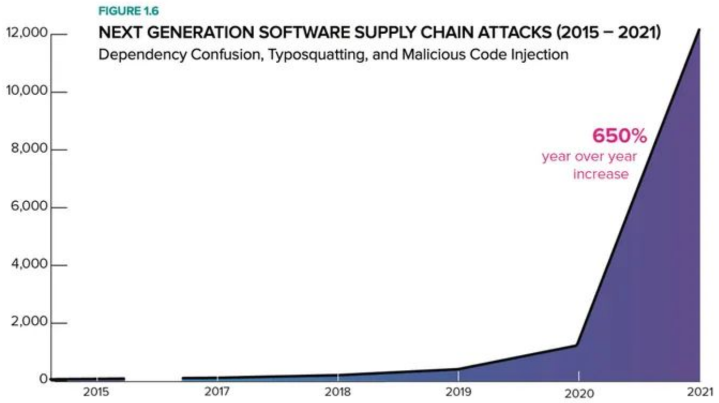


FIGURE 1.6

NEXT GENERATION SOFTWARE SUPPLY CHAIN ATTACKS (2015 – 2021)

Dependency Confusion, Typosquatting, and Malicious Code Injection

There has been an astonishing

742%

average annual increase in Software Supply Chain attacks over the past 3 years.

Read the 8th Annual State of the Software Supply Chain Report

01010
11101
00101
66%
OF ATTACKS FOCUS ON THE SUPPLIER'S CODE
58%
of attacks aimed to access data
SUPPLY CHAIN ATTACKS ON THE RISE
62%
of the attacks exploit the trust of customers in their supplier
62%
OF ATTACKS RELY ON MALWARE

ENISA Threat Landscape for Supply Chain Attacks

Increase in Attacks lead to strong industry response

Producing Trusted Software & Attestations

TEKTON

SLSA

FRSCA

in-toto

sigstore

SPDX

TUF

trivy

grype

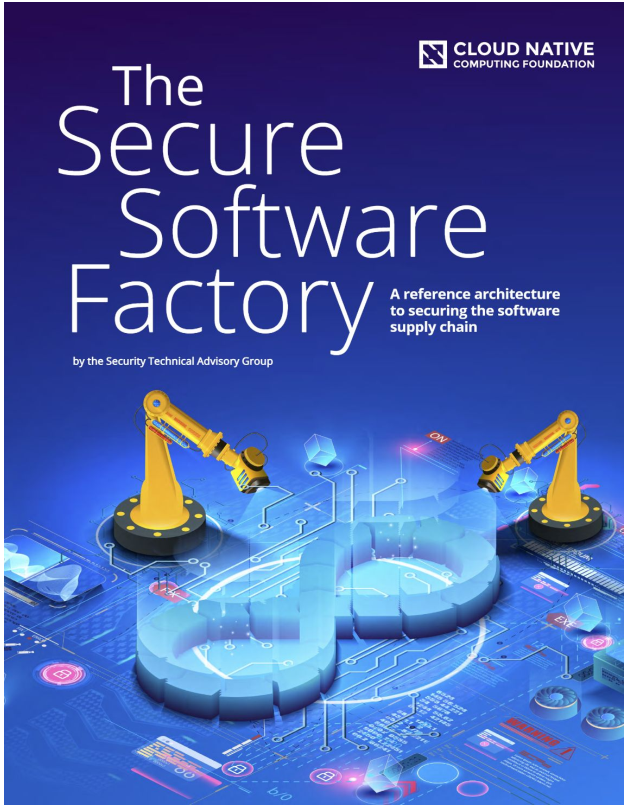
Scorecards

Keylime

SPIRE

CycloneDX

spiffe



CLOUD NATIVE COMPUTING FOUNDATION

The Secure Software Factory

A reference architecture to securing the software supply chain

by the Security Technical Advisory Group

Producing Trusted Software & Attestations

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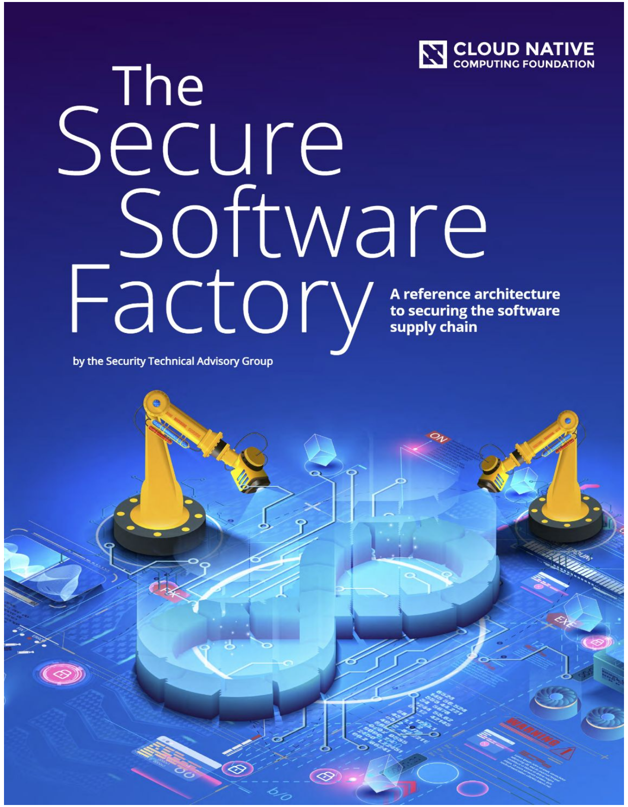

CLOUD NATIVE
COMPUTING FOUNDATION

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Secure
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Factory

A reference architecture to securing the software supply chain

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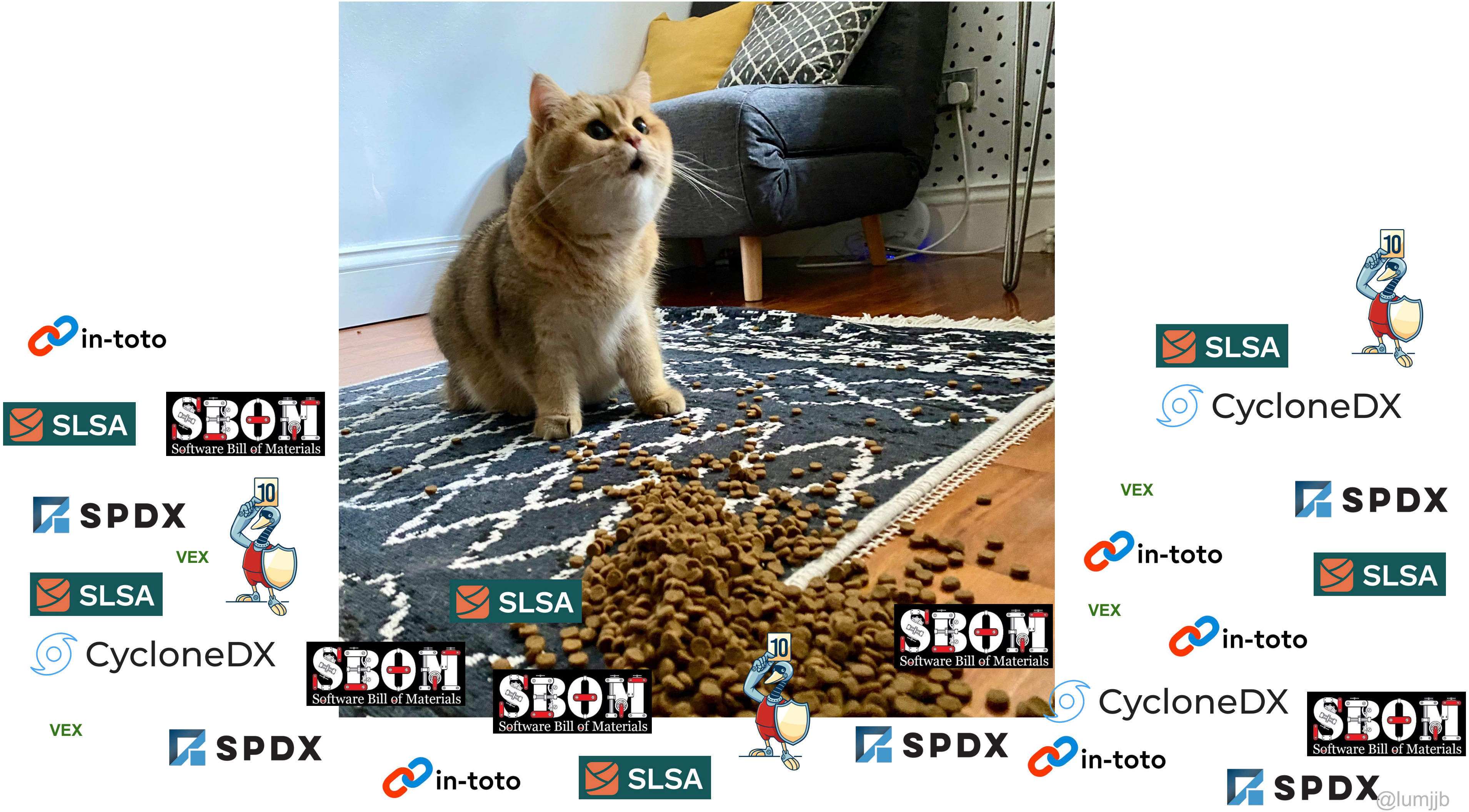
Producing and Consuming

Producing and Consuming


in-toto
SLSA
SBOM
Software Bill of Materials
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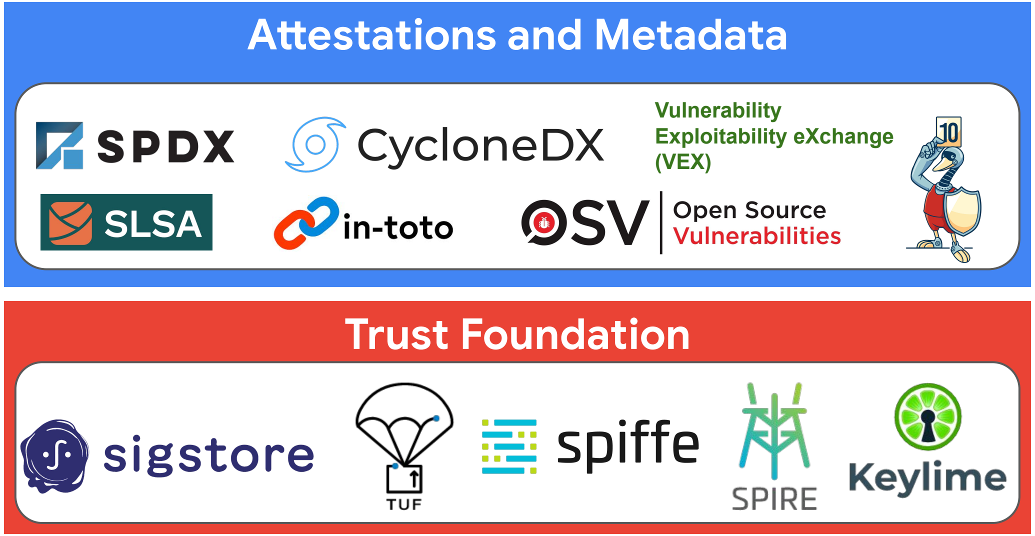
Outcome of Producing



Attestations and Metadata

SPDX
CycloneDX
Vulnerability Exploitability eXchange (VEX)
10
SLSA
in-toto
OSV
Open Source Vulnerabilities

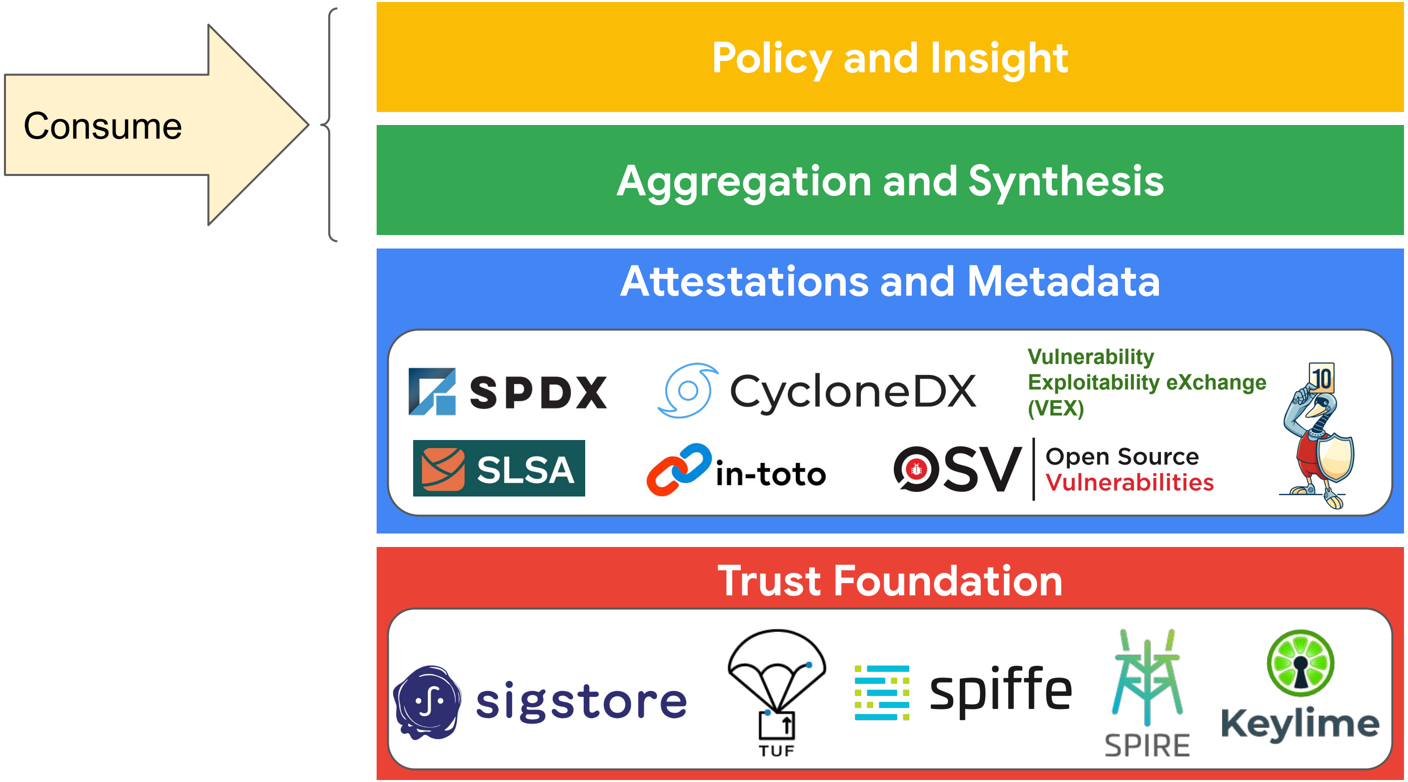
Trust Foundation

sigstore
TUF
spiffe
SPIRE
Keylime

Schemas and sources for rich security metadata

A decentralized, flexibly anchored trust fabric

Software Supply Chain Integrity Consumption


Consume
Policy and Insight
Aggregation and Synthesis
Attestations and Metadata
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Automation and compliance throughout the SDLC

Intelligent aggregation across artifacts and identities

Schemas and sources for rich security metadata

A decentralized, flexibly anchored trust fabric

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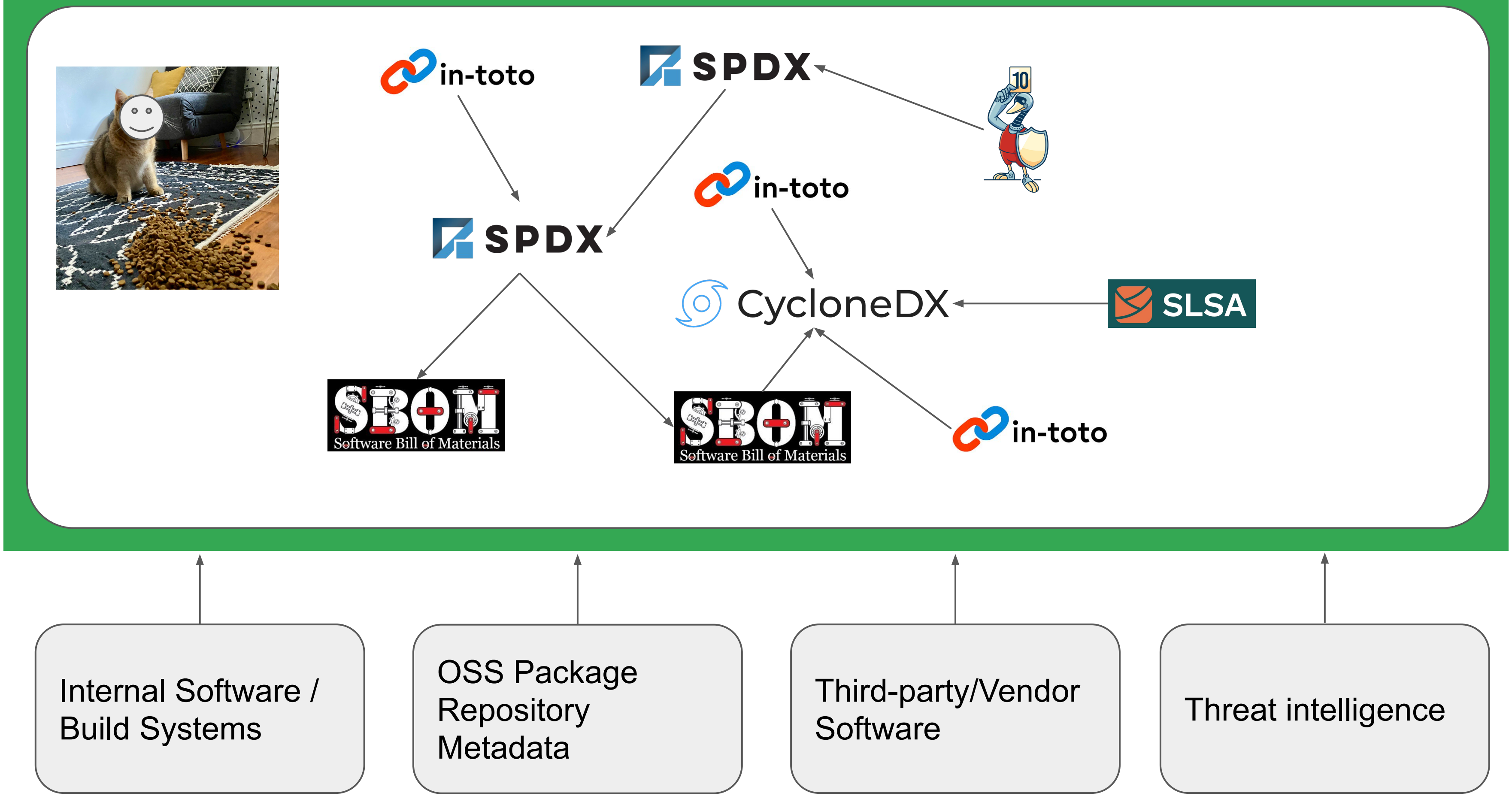
Aggregation and Synthesis



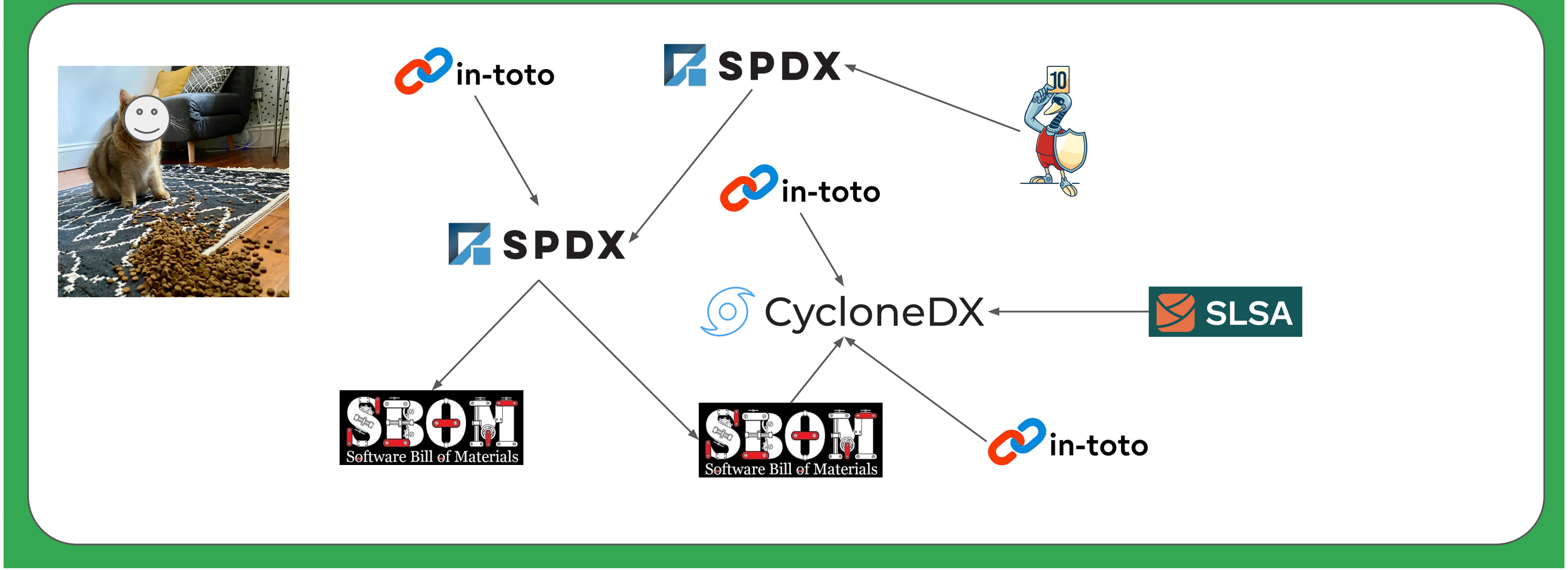
Internal Software / Build Systems

OSS Package Repository Metadata

Third-party/Vendor Software

Threat intelligence

Aggregation and Synthesis



Internal Software / Build Systems

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Threat intelligence

Consuming - Aggregation & Synthesis

Multi-source generic aggregator

GUAC

Public Data Source Aggregators

deps.dev

Repology

Package Managers

python™ Package Index

RubyGems

…

OPEN CONTAINER INITIATIVE

Consuming - Policy

Mechanism to create and enforce

Kyverno

Open Policy Agent

+ Proprietary GRC / CMDB systems

How to evaluate and enforce

What are checks for “Good” Supply Chain Security”?

TAG Security Issue #987

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Consuming - Policy and Insights

Reactive

HOW AM I AFFECTED???

A vulnerability or supply chain compromise is discovered!

+ Codecov, Solarwinds compromises

Preventive

Have I taken the right safeguards?

When deciding to use and deploy software, are there sufficient security checks and approvals?

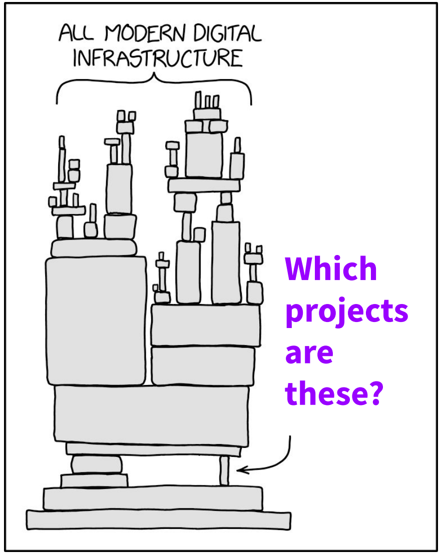
SLSA

aqua trivy

grype

Proactive

How do I prevent large scale supply chain compromises?



Which projects are these?

https://xkcd.com/2347/

Consuming - Policy and Insights

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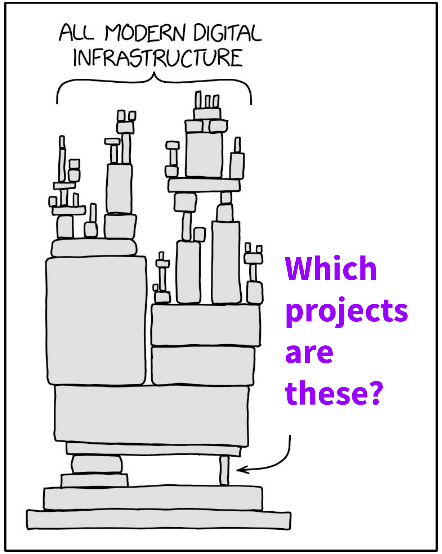

Which projects are these?

https://xkcd.com/2347/

Call to Action

SBOM
Software Bill of Materials
CycloneDX
SPDX
in-toto
SLSA
Yes, all the ingredients used are certified

- Let's start to dive deeper into **"Aggregation & Synthesis"** and **"Policy and Insights"**

- Join community efforts: TAG Security Issue #987

- Talks at CNSCon related to consumption
  - Not All That's Signed Is Secure: Verify the Right Way with TUF and Sigstore
  - Spicing up Container Image Security with SLSA & GUAC