SBOM and SPDXv3 Update

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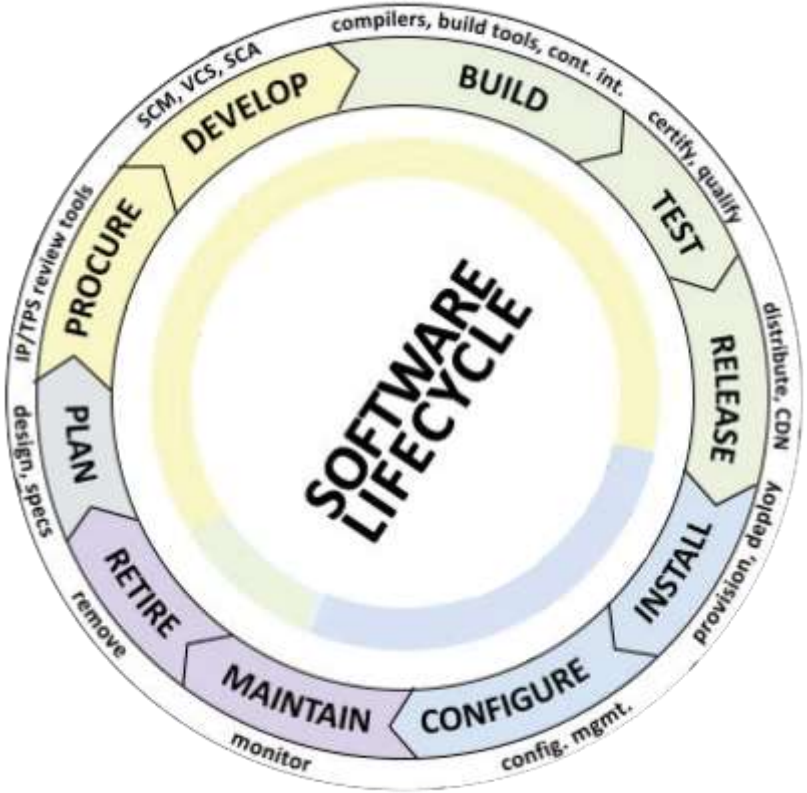
Generate SBOMS when the data is known

Source SBOM

Design SBOM

Runtime SBOM



Build SBOM

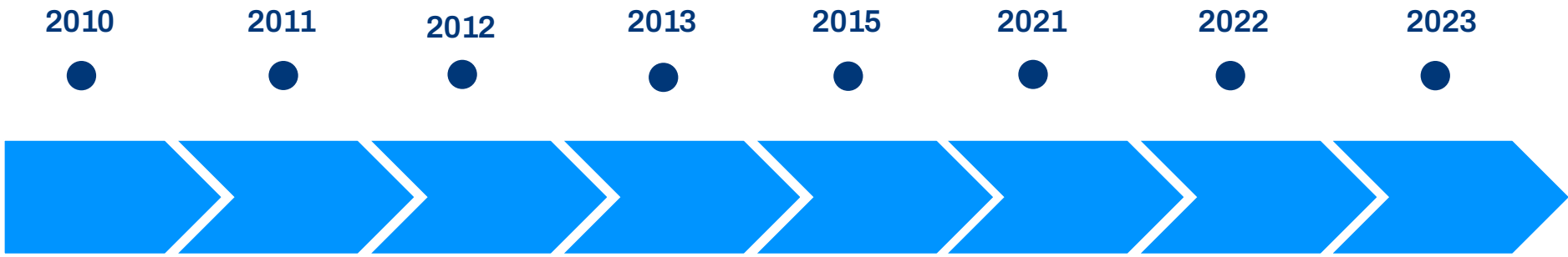
Deployed SBOM

SPDX

Managing set of relevant items with SBOMs

	Design SBOM	Functional Safety Management (Plans) and Safety Concept
	Source SBOM	Requirements, Design, Safety Analysis, Source Code, Test Cases
	Build SBOM	Build Framework, Build configuration and environment data, Test Framework, Executable, Test Reports
	Deploy SBOM	Deployed configuration and environment data, Hardware architecture specific information and data, deployment tests and reports
	Runtime SBOM	Runtime relevant data (configuration data), training data, error logging data

The road to SPDX 3.0



2010 — Standardized Single Package Information: Machine and human readable formats

2011 — Compliance Use Cases: Additional Project and License Information

2013 — Package Relationships: 30+ additional use cases supported for complex packaging and distribution scenarios

2015 — Security use cases: External references for vulnerabilities and product identification

2021 — ISO Standard

2022 — Format Interoperability

2023 — Profiles: Support several new areas of use cases without increasing the complexity (e.g. Build, Defects, AI, Data)

SPDX

Why SPDX 3.0?

- Interest in SPDX for additional scenarios and use cases
  - Supporting security and safety critical application compliance requirements
  - AI/ML and datasets increasing need for transparency
  - Software Build provenance
- Simplify
  - Profiles
  - Remove confusing names
  - Reorganize and enable general SBOM use cases with minimum overhead
- Flexibility
  - Designed for online access
  - Can communicate a single element
  - Support optional inclusion properties for specific profiles
  - Enhanced relationship structure

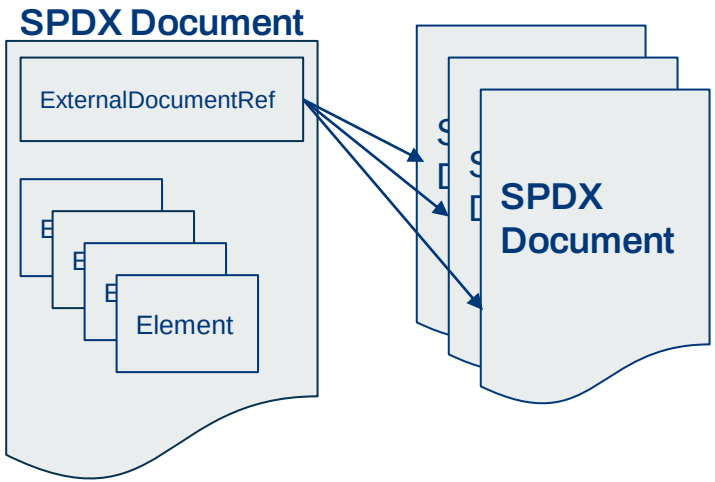
SPDX 3.0 Specification Infrastructure

- Specification is being transformed into markdown describing
  - Classes, Properties, Enumerations
  - Metadata (type and cardinality) and description for each element
  - Automatically generate schema from this version (for JSON, RDF, XML, etc.) as well as web and print editions

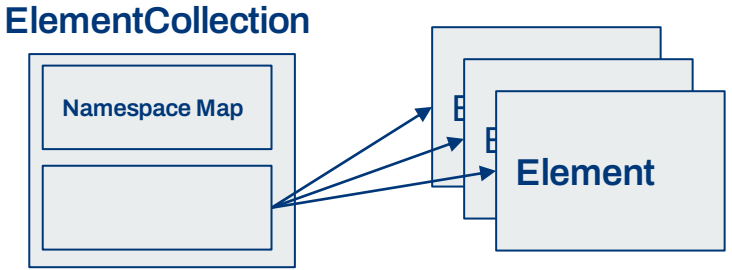
- Profiles can add their own Classes and Properties and may also restrict other profiles (e.g. values, cardinalities, etc)
- See https://github.com/spdx/spdx-3-model

External Document Reference Changes

SPDX 2.3



SPDX 3.0



SPDX

SPDX Profiles

Introducing SPDX Profiles

Profile Conformance

Is the SPDX creator asserting the data is there for my use case?

Profile Name Space

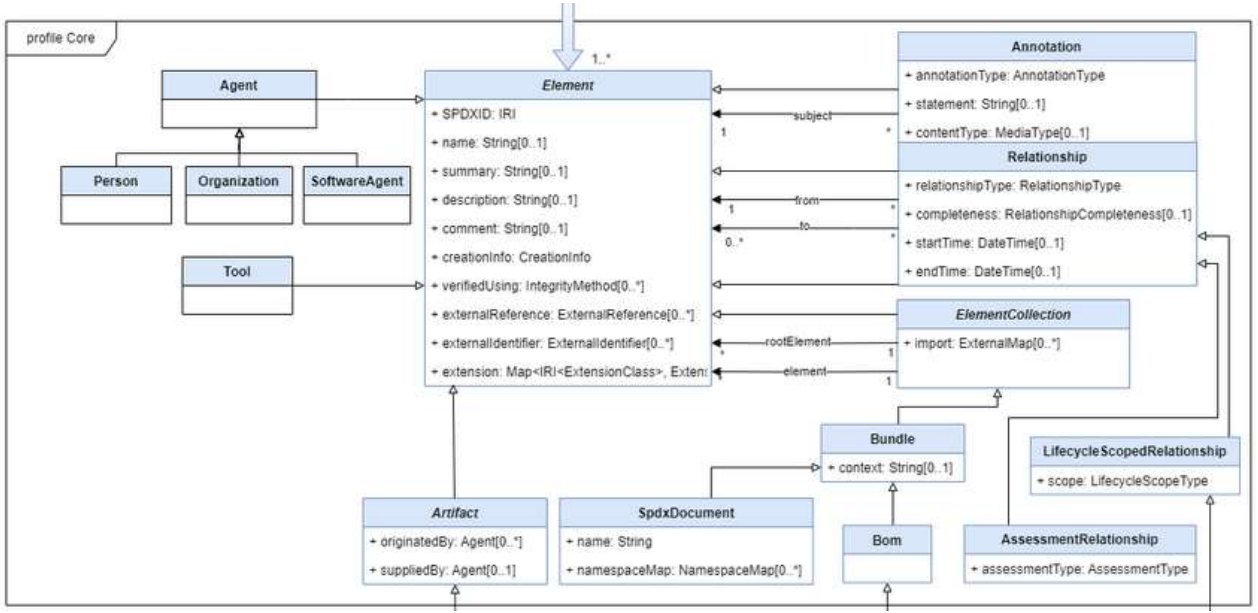
Where's the spec I'm interested in?

Profile Workgroup

How can I contribute?

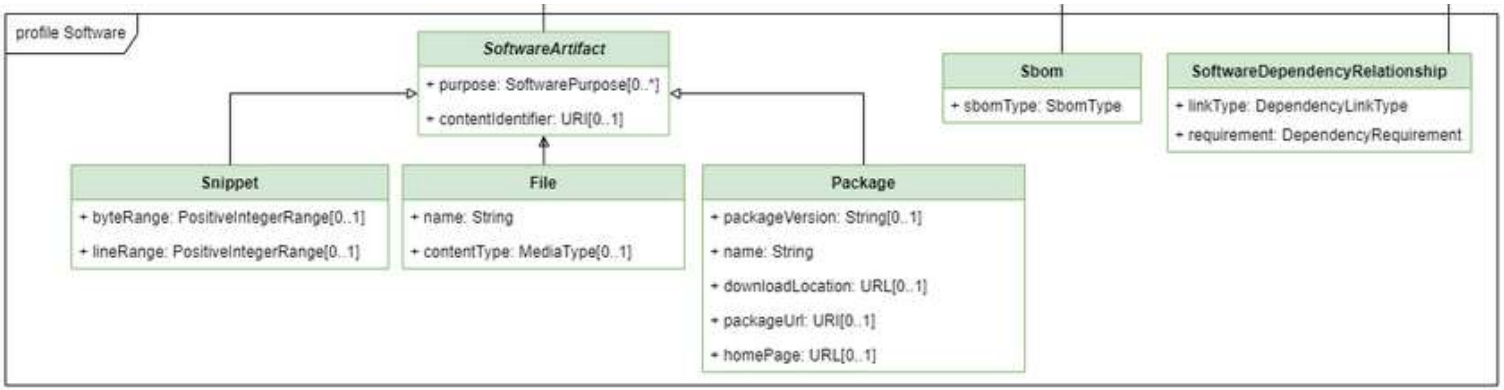
Core Profile Overview

- Defines foundational concepts which are the basis for all SPDX 3.0 profiles



Software Profile Overview

- Defines concepts related to software artifacts
- Introduces and supports CISA SBOM Types
  - Design/Source/Build/Deployed/Runtime/Analyzed



https://www.cisa.gov/sites/default/files/2023-04/sbom-types-document-508c.pdf

Licensing Profile Overview

- Split into two separate profiles with different ways to represent license expressions:
  - SimpleLicensing: via SPDX License Expression syntax strings
  - ExpandedLicensing: via object model corresponding to each license component
- License model
  - includes those previously defined in SPDX 2.3, as well as SPDX License List fields
  - represents Licenses, License Exceptions, and the data model for license combinations (AND, OR, WITH, +)
  - now with License Additions (custom text for right side of WITH expressions)
- Relationships for Licensing-related metadata
  - conceptually similar to SPDX 2.3
  - now structured as SPDX Relationships rather than properties
  - enables one SPDX data creator to define the software artifacts, and others to later specify their conclusions as to licenses by reference to the same artifacts

Security Profile Overview

Captures security-related metadata specific to a piece of software

- Security profile v3.0 properties and relationships support vulnerability management.
  - discovery & disclosure: Communicate the vulnerabilities found by person (auditor/researcher), tool, or organization in a particular piece of software, e.g. CVE
  - severity: Communicate severity and rank vulnerabilities in a specific piece of software using industry standardized methods, e.g. CVSS
  - risk: Communicate how a vulnerability affects a specific piece of software, e.g., EPSS, VEX
  - remediation: Communicate how a vulnerability may be addressed or has already been addressed for a particular piece of software
- Security assurances for software integrity and other secure SDL activities are also supported in SPDX 3.0

AI & Data Profile Overview

A profile that adds on top of the Core and Software profiles to describe AI-specific elements that will enable transparency and traceability of both components and processes.

A profile that adds on top of the Core and Software profiles to describe the datasets that are used to train or test an AI software.
Similar to AI profile, it captures both components and processes – also provenance and lineage.

Profiles Beyond SPDX 3.0

More to come…

- Software as a Service
  - Profile team has been active for about 3 months
  - Tracking the CISA workgroup
- Safety
  - We're realizing that we already have in 3.0 most of what we need
- Hardware
  - Safety Standards expect to know "system" that software is running on
  - Potential participants include RISC-V & ARM core adopters, Chips Alliance Members and Board Manufacturers

Participate!

- Teams
  - Technical
  - Legal
  - Outreach
- Profile groups

- Mailing lists
- Meetings
- GitHub

Thank you!

Questions?