Production, Consumption, and the Data

The Open Source Security Sandwich

About Mike

- Co-founder and CTO Kusari a Software Supply Chain Security Company
- Co-author of Securing the Software Supply Chain from Manning
- OpenSSF Technical Advisory Council and SLSA Steering Committee member
- CNCF Technical Advisory Group Security Lead
- Co-creator and maintainer of GUAC an OpenSSF Incubating Project

The Problem with Security

- Traditionally security has been a gating function
- Security is not seen as an end user feature
- Security can be secretive (though it shouldn't be)
- Not as much open source security tooling

Conway's Law (Always Relevant)

Any organization that designs a system (defined broadly) will produce a design whose structure is a copy of the organization's communication structure.
- Melvin Conway

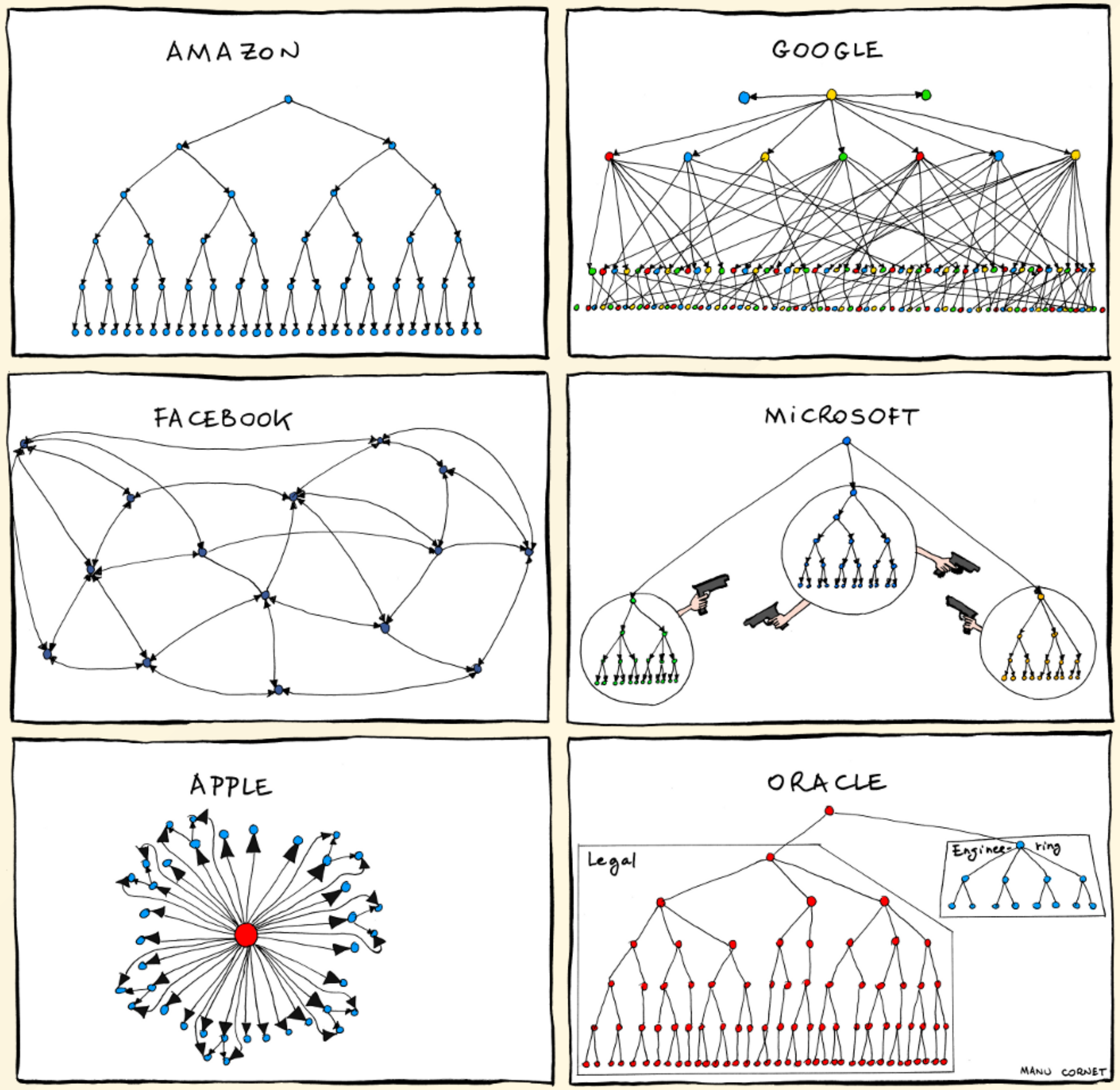


Image credit: https://bonkersworld.net/organizational-charts

Image Credit: "Fire in Dumpster" by benwatts is licensed under CC BY 2.0 .

Organizational Structure of OSS

- Foundations
- Corporations
- Everyone else
    - Volunteers
    - Hobbyists

Open Source Communication

- Open source maintainers don't owe anybody anything
- Not every project is maintained by a foundation or sponsored by a business
- Communication can be chaotic
    - Sometimes conflicting goals
- Communication is often asynchronous
    - World-wide
    - Volunteer's spare time
    - Not always a priority

Open Source Security Communication

- Sometimes it can be the worst of both worlds
- Security stakeholders attempting to be gatekeepers
- Maintainers have enough on their plate
- Too much security noise

State of the World Today*

- Proprietary data formats
- Lack of standardization
- Lack of security automation
- Lack of security templates

* Note: It's been changing

Open data formats and practices!

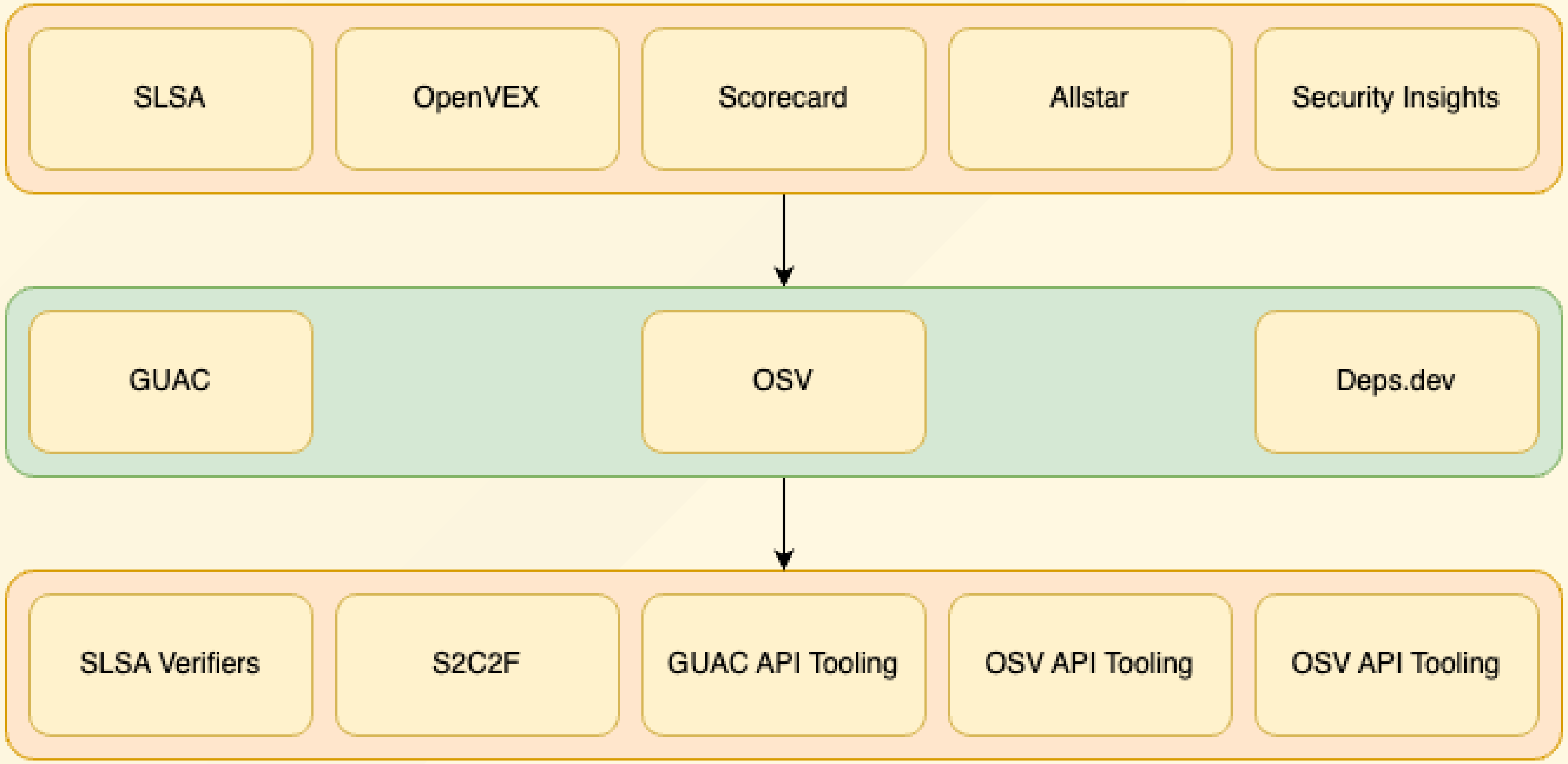
- Open specifications backed by foundations and standards bodies over proprietary formats
- Open standard metadata stores and analytics platforms over proprietary walled gardens
- Open APIs over tightly coupled and locked down vendor applications
- Helps ensure we're all speaking the same language

NO	YES
Proprietary SCA Reports	SBOMs
Unstructured build logs and practices	SLSA
Exceptions via email	VEX
Proprietary health metrics	Scorecard
Custom security rule enforcement	Allstar
Arbitrary project layouts	Security Insights
Control spreadsheets for ingestion	S2C2F and OSCAL
Tight coupling of SDLC systems	CD Events
Custom analytics and data stores	GUAC

A Quick Tangential Rant

- Human readable documentation for a specification is good
- Machine readable specifications as the canonical definitions is needed as well
- JSON Schema, RDF, OWL, XSD, etc.
    - Codegen with type, constraint, and regex validation!
- Protobuf is good for on the wire, not great for validations outside of basic types (string, int32)

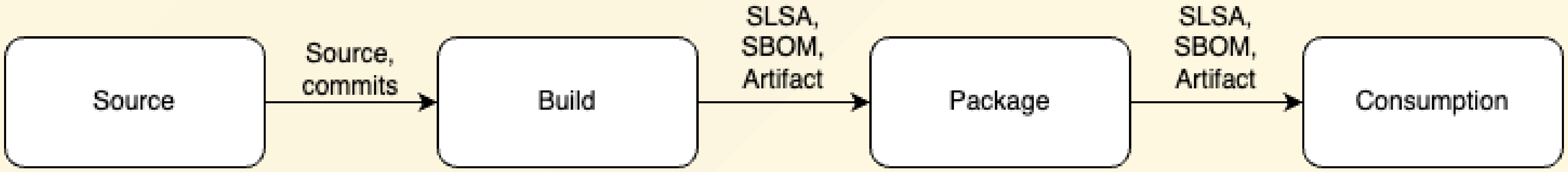
High Level


SLSA
OpenVEX
Scorecard
Allstar
Security Insights
GUAC
OSV
Deps.dev
SLSA Verifiers
S2C2F
GUAC API Tooling
OSV API Tooling
OSV API Tooling

Next Steps

- Standard data formats means they can be used in API specifications!
    - OpenAPI/GraphQL/AsyncAPI
- Event driven is a MUST
    - We don't control what other OSS maintainers do
    - We need to rely on events and can't tightly couple
- Tie it all together in a toolbelt, a security toolbelt!
- Eventually a Software Supply Chain Control Plane

What Does That Look Like?



What about Today?

- Let's make it simple to get started
- Leave retrofitting for later
  - Show what we can do
- New projects should have security guardrails

How do we implement this for Producers? (Example)

- Create Github repo
- Github action SLSA builder enabled
- Github action Scorecard enabled
- Github action GUAC enabled to
- Github action for SBOM
- Allstar application enabled on org if not already
- SECURITY-INSIGHTS.yml template with defaults

How do we implement this for Consumers? (Example)

- Verify SLSA, Scorecard, etc. if they are being used
- Query GUAC, OSV, ETC
- Follow S2C2F practices, especially when the above aren't being followed
  - Build from source
  - Run scans

How do we put it together and scale it? (Example)

- Store SLSA, SBOMs, Scorecard, etc. in GUAC
- Use GUAC, OSV, Deps.dev as data sources for policy and automation

Takeaways!

- Use open standards for production and consumption of software
- Use open specifications for the data models
- Store data in open source data stores like GUAC, OSV, Deps.dev
- Communication in open source works when it's OPEN!

Here Come Skoot!

- Scute is a term for the bony plates on a turtle (along with other things)
- Scute is also a term for a shield
- Security is turtles all the way down
- Skoot is a tool to try and tie some of the other pieces together easier.
- This is an open source POC in Rust called Skootrs under https://github.com/kusaridev/skootrs

Where does Skoot go from here?

- If folks like it, let's make this more than just a POC!
- Add additional OpenSSF security tools
- Support multiple languages
- Support exporting linking output into datastores like OpenSSF Incubating Projects GUAC
- Support linking with verification tools
- Support outputting Skoot data in an open format.
- Support retrofitting existing repos

Thanks!

- If you want to learn more about GUAC and see it in action come to my talk tomorrow!
- I have links to my book, GUAC, and stickers!