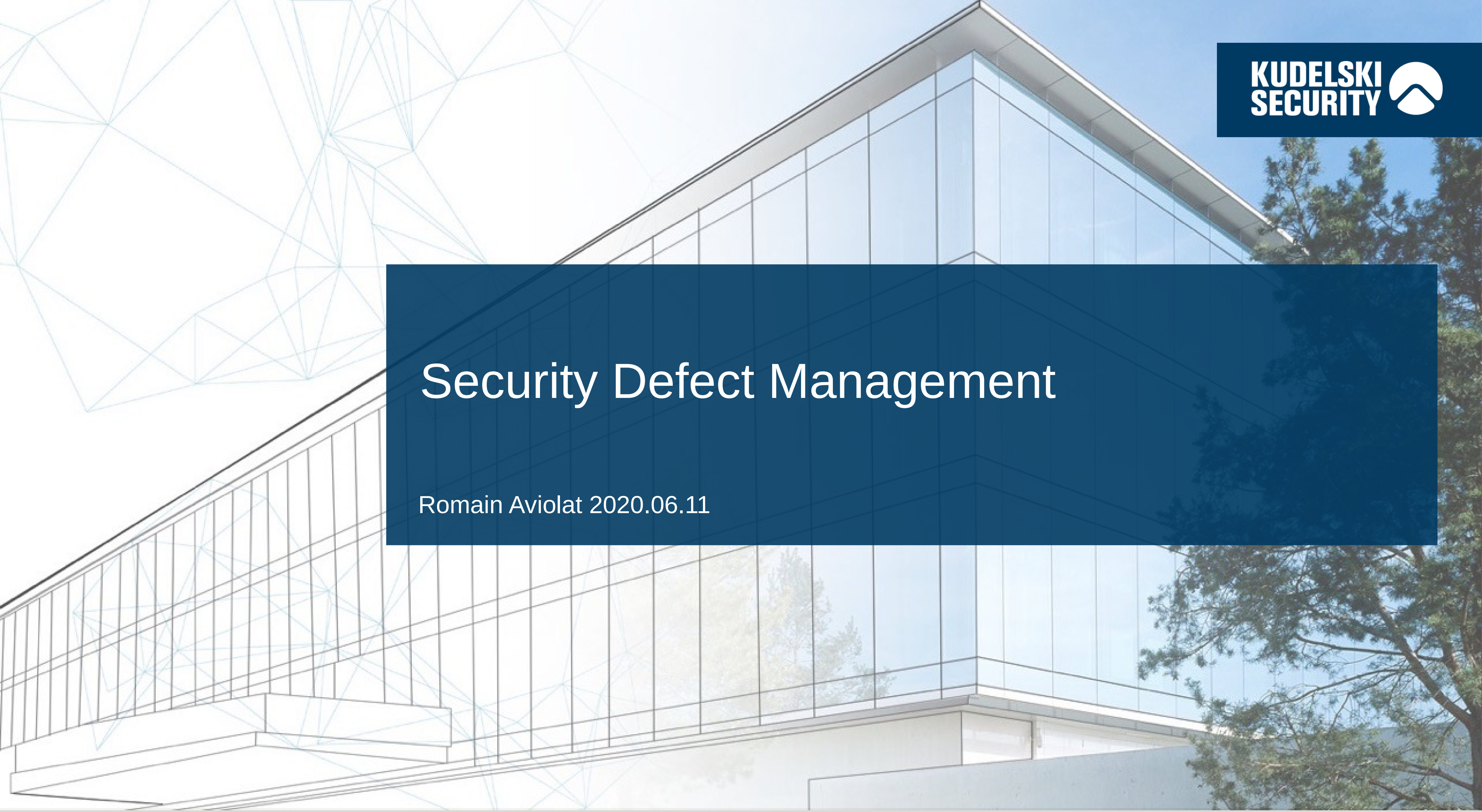

Security Defect Management

Romain Aviolat 2020.06.11

Me

Cloud and Security enthusiast

Love automation, infrastructure-as-code, DevSecOps

SME for security related question / architecture (Network, IAM, Cloud, BeyondCorp, SSDLC, …), security champions / guild.

Thanks Giulio for setting this up !

Today’s talk is about

Discussing the complexity of collecting intelligence about the security issues of a product / infrastructure, and the challenges that are facing DevSecOps teams in prioritizing fixes.

Based on my personal experience.

Spoiler: I don’t have all the answers
(feedback welcome)

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Systems security

There’s no such thing as a secure software, or a secure operating system.

- Systems can be patched against known vulnerabilities (NVD, OSVDB, …)
- What about unknown vulnerabilities ? (0day, darknets, …)
- Vulnerabilities that have not been found yet

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One line of defense is to collect as much information as possible about our products

Information can come at different stages

1) At Build / Release time
2) At scan-time (daily, weekly, …)
3) At Pen-test-time (yearly / ISO27001)
4) (When your data are available on paste-bin)

You need to have visibility on all these stages (incl 4… / collecting intelligence)

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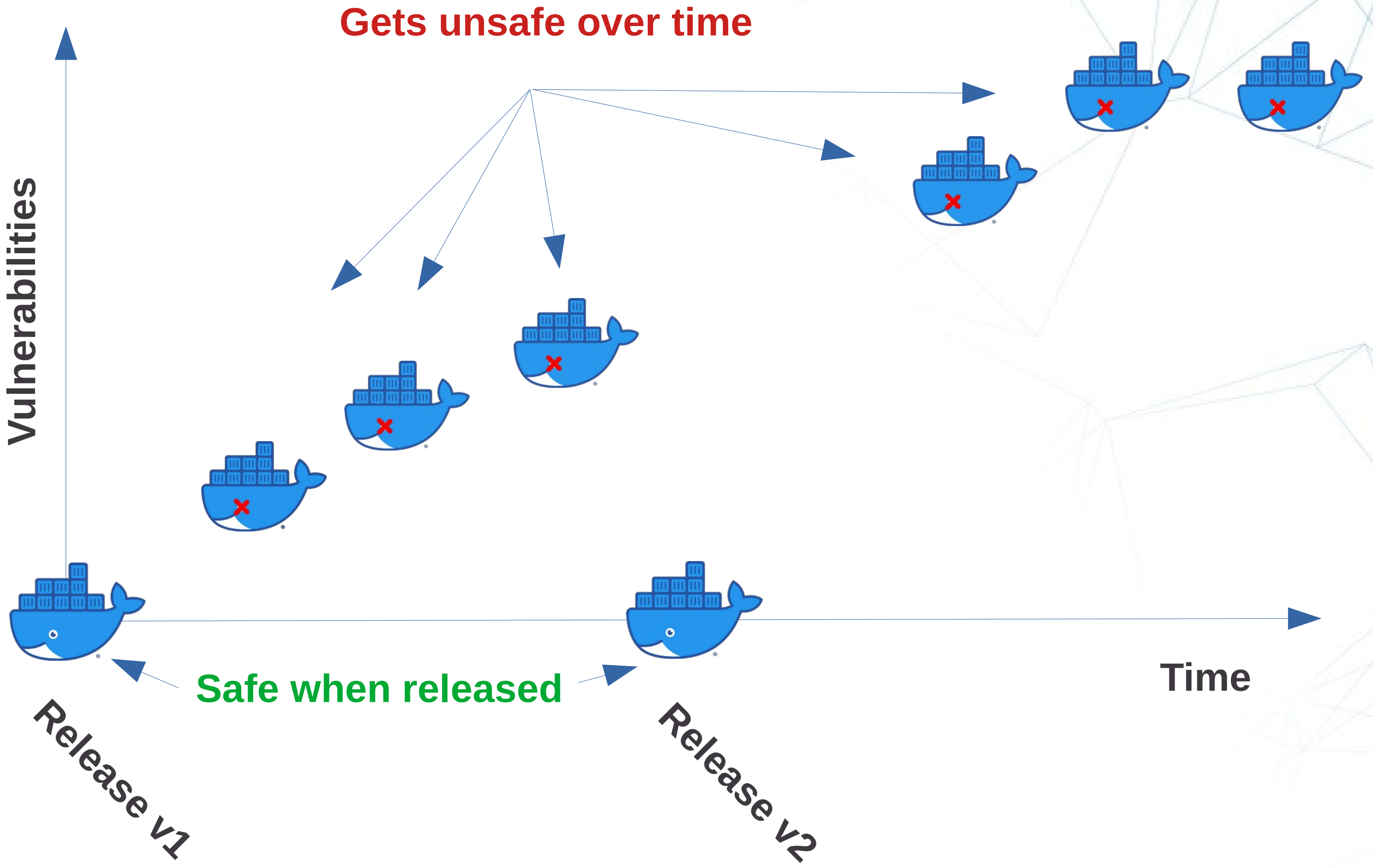
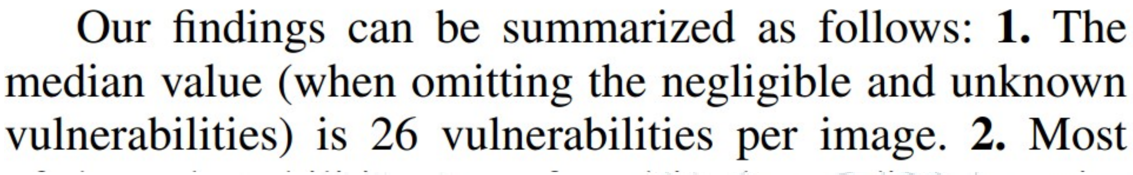
Security of products is often linked to product releases

- Even with modern CI/CD workflows, security is assessed during the release stage.
- If you don't re-release often then the security posture of your products = security at release-time + all the vulnerabilities found in the meantime.
- Container-scanning usually don't make a lot of sense if you use latest versions at build-time.



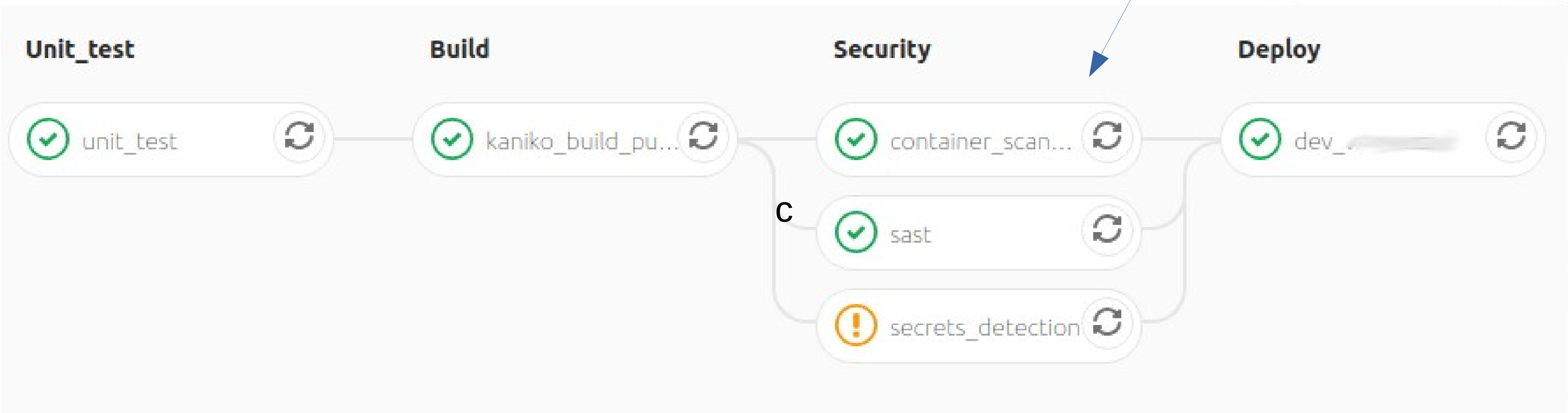
At Build / Release time



Our findings can be summarized as follows: **1.** The median value (when omitting the negligible and unknown vulnerabilities) is 26 vulnerabilities per image. **2.** Most

Vulnerability Analysis of 2500 Docker Hub Images https://arxiv.org/pdf/2006.02932.pdf

- Check your code (SAST, code quality)
- Ensure you’re not leaking secrets in your commits (git-secrets)
- Scan you containers
- Make sure that your releases are as clean as possible



Pros / Cons

+ Catch issues early in the release-cycle

+ Context around the issue (problem with a library introduced with the new feature)

- Can slow down pipelines, sometimes needs to be moved to QA pipelines (Fuzzing, Deep container scanning, ...)
- Not always easy to handle false-positives
- Hard to get “always green” jobs (fatigue)

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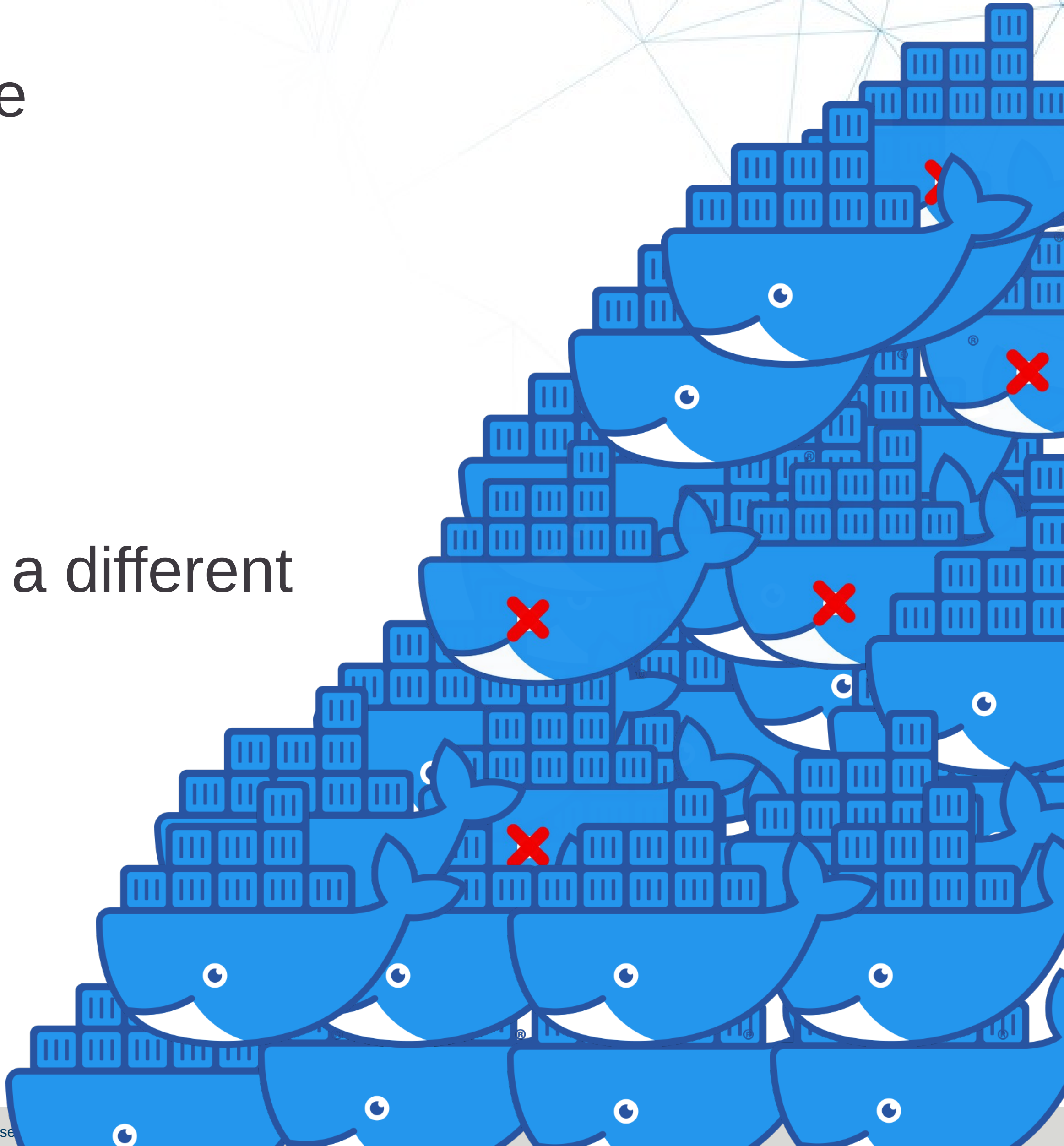
At scan-time

- Daily or weekly perimeter / vulnerability scan
- Daily container-registry-scans
- Daily web-app scans (OWASP top ten connected scans, ...)

Pros / Cons

+ Catch issues outside of the release-cycle

- Context is usually lost:
  - To whom does it belong ?
  - Is it running in production ?
  - Is it business-critical ?
- Perimeter scans are usually operated by a different team. (or company).



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At pen-test-time

+ Catch issues that automated tools would have missed
+ Things that computers can hardly do (yet)
  - Social-engineering
  - identify weak processes

- Frequency is not great
- Process is often painful (legal / mgmt, PR/PO, scoping, reports, ...)

Clean releases + continuous assessment over time + context

Defect-Management

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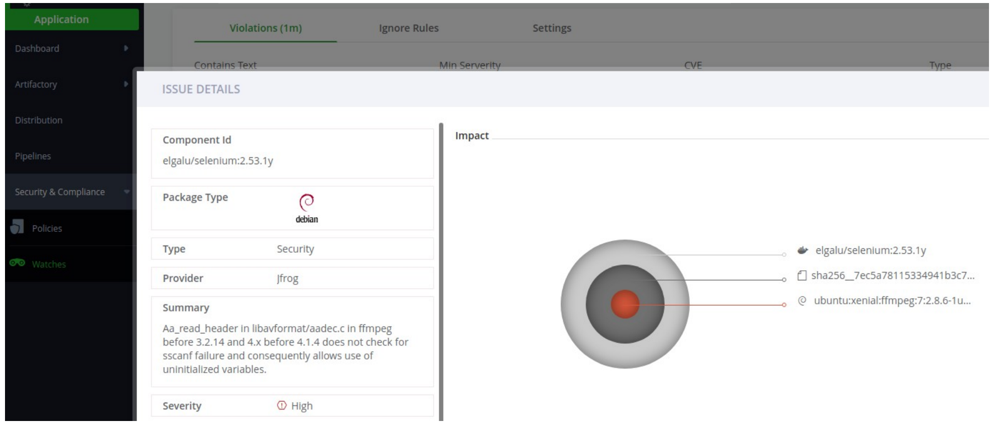
Security Defect Management

- Usually all inside their own silo
  - Container scanning, perimeter scans, webapp testing, sast, K8s, … .
- Loss of context

WebUIs, emails



Component Id
elgalu/selenium:2.53.1y

Package Type: debian

Type: Security

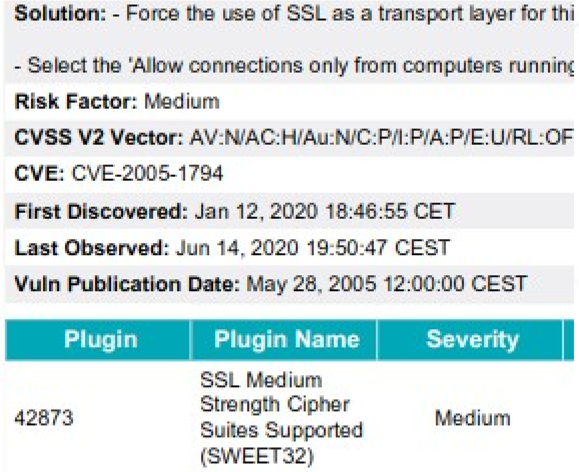
Provider: Jfrog

Summary
Aa_read_header in libavformat/aadec.c in ffmpeg before 3.2.14 and 4.x before 4.1.4 does not check for sscanf failure and consequently allows use of uninitialized variables.

Severity: High

Impact
elgalu/selenium:2.53.1y
sha256__7ec5a78115334941b3c7...
ubuntu:xenial:ffmpeg:7:2.8.6-1u...

700 pages PDF reports



Solution: - Force the use of SSL as a transport layer for thi

- Select the 'Allow connections only from computers running

Risk Factor: Medium

CVSS V2 Vector: AV:N/AC:H/Au:N/C:P/I:P/A:P/E:U/RL:OF

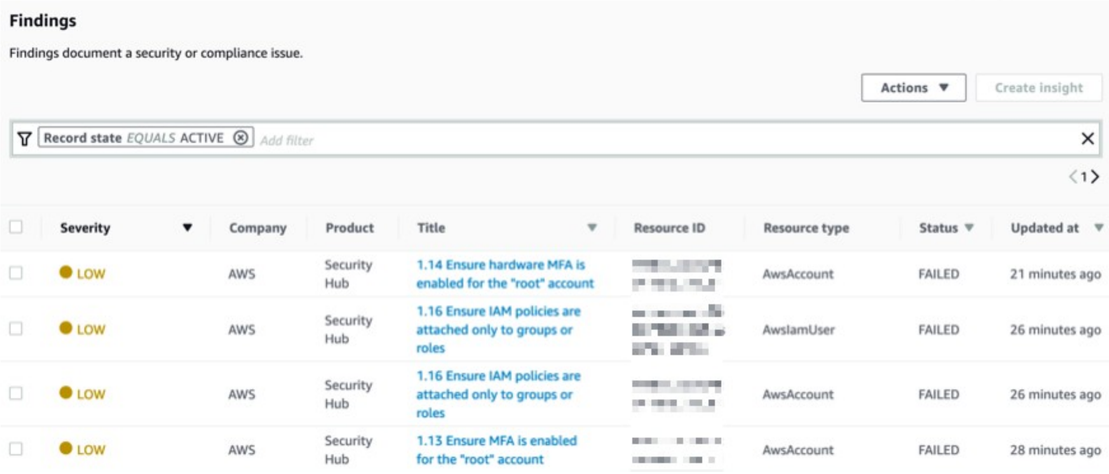
CVE: CVE-2005-1794

First Discovered: Jan 12, 2020 18:46:55 CET

Last Observed: Jun 14, 2020 19:50:47 CEST

Vuln Publication Date: May 28, 2005 12:00:00 CEST

Plugin	Plugin Name	Severity
42873	SSL Medium Strength Cipher Suites Supported (SWEET32)	Medium



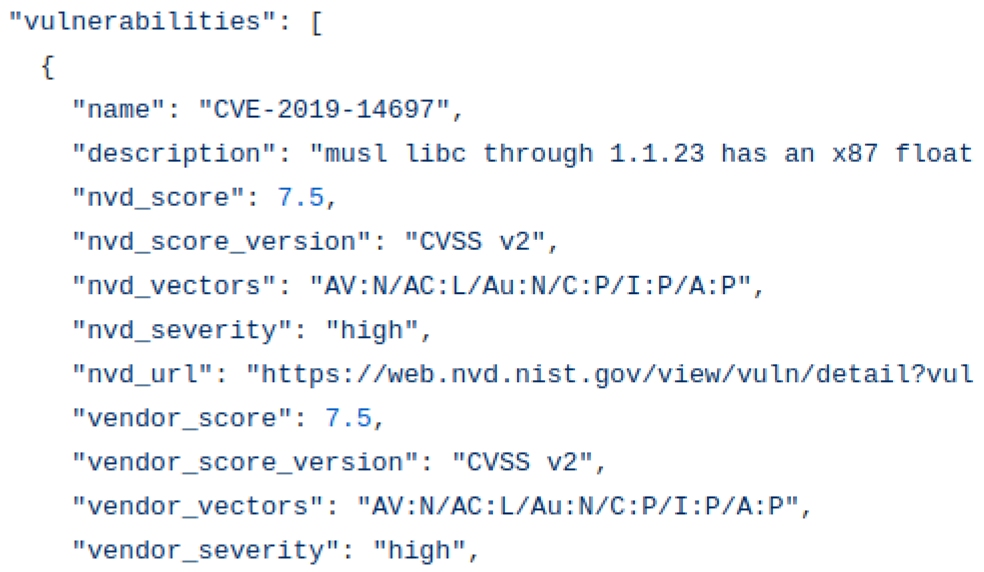
Findings

Findings document a security or compliance issue.

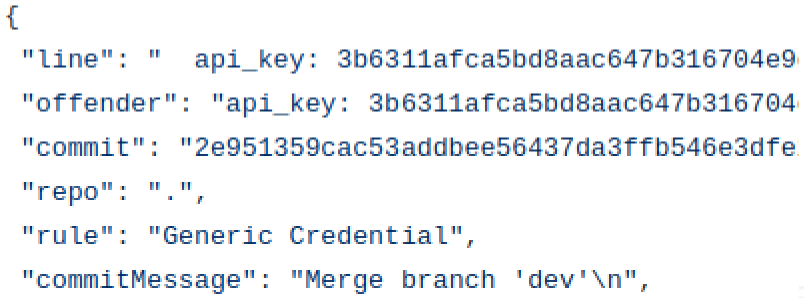
□	Severity ▼	Company	Product	Title ▼	Resource ID	Resource type	Status ▼	Updated at ▼
□	● LOW	AWS	Security Hub	1.14 Ensure hardware MFA is enabled for the "root" account	[redacted]	AwsAccount	FAILED	21 minutes ago
□	● LOW	AWS	Security Hub	1.16 Ensure IAM policies are attached only to groups or roles	[redacted]	AwsIamUser	FAILED	26 minutes ago
□	● LOW	AWS	Security Hub	1.16 Ensure IAM policies are attached only to groups or roles	[redacted]	AwsAccount	FAILED	26 minutes ago
□	● LOW	AWS	Security Hub	1.13 Ensure MFA is enabled for the "root" account	[redacted]	AwsAccount	FAILED	28 minutes ago

Security Defect Management

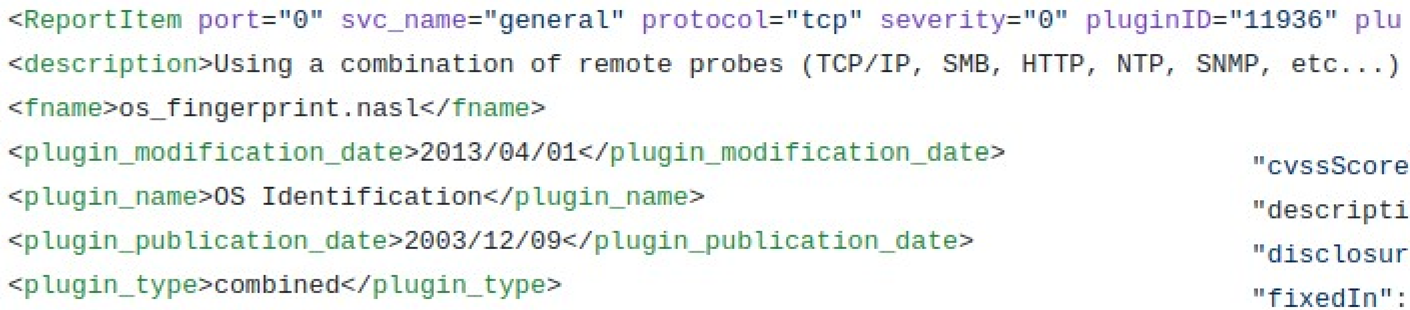
All these tools are usually generating computer-readable information.



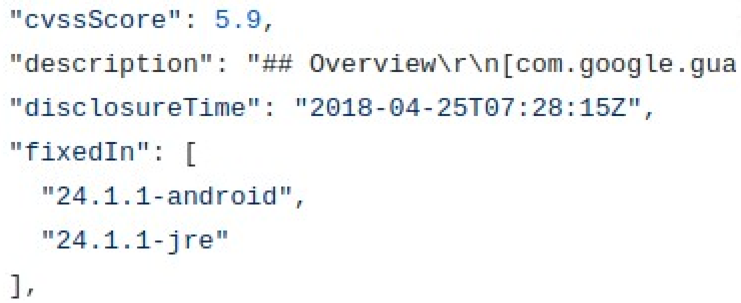
```
"vulnerabilities": [
  {
    "name": "CVE-2019-14697",
    "description": "musl libc through 1.1.23 has an x87 float
    "nvd_score": 7.5,
    "nvd_score_version": "CVSS v2",
    "nvd_vectors": "AV:N/AC:L/Au:N/C:P/I:P/A:P",
    "nvd_severity": "high",
    "nvd_url": "https://web.nvd.nist.gov/view/vuln/detail?vul
    "vendor_score": 7.5,
    "vendor_score_version": "CVSS v2",
    "vendor_vectors": "AV:N/AC:L/Au:N/C:P/I:P/A:P",
    "vendor_severity": "high",
```



```
{
 "line": "  api_key: 3b6311afca5bd8aac647b316704e9
 "offender": "api_key: 3b6311afca5bd8aac647b316704
 "commit": "2e951359cac53addbee56437da3ffb546e3dfe
 "repo": ".",
 "rule": "Generic Credential",
 "commitMessage": "Merge branch 'dev'\n",
```

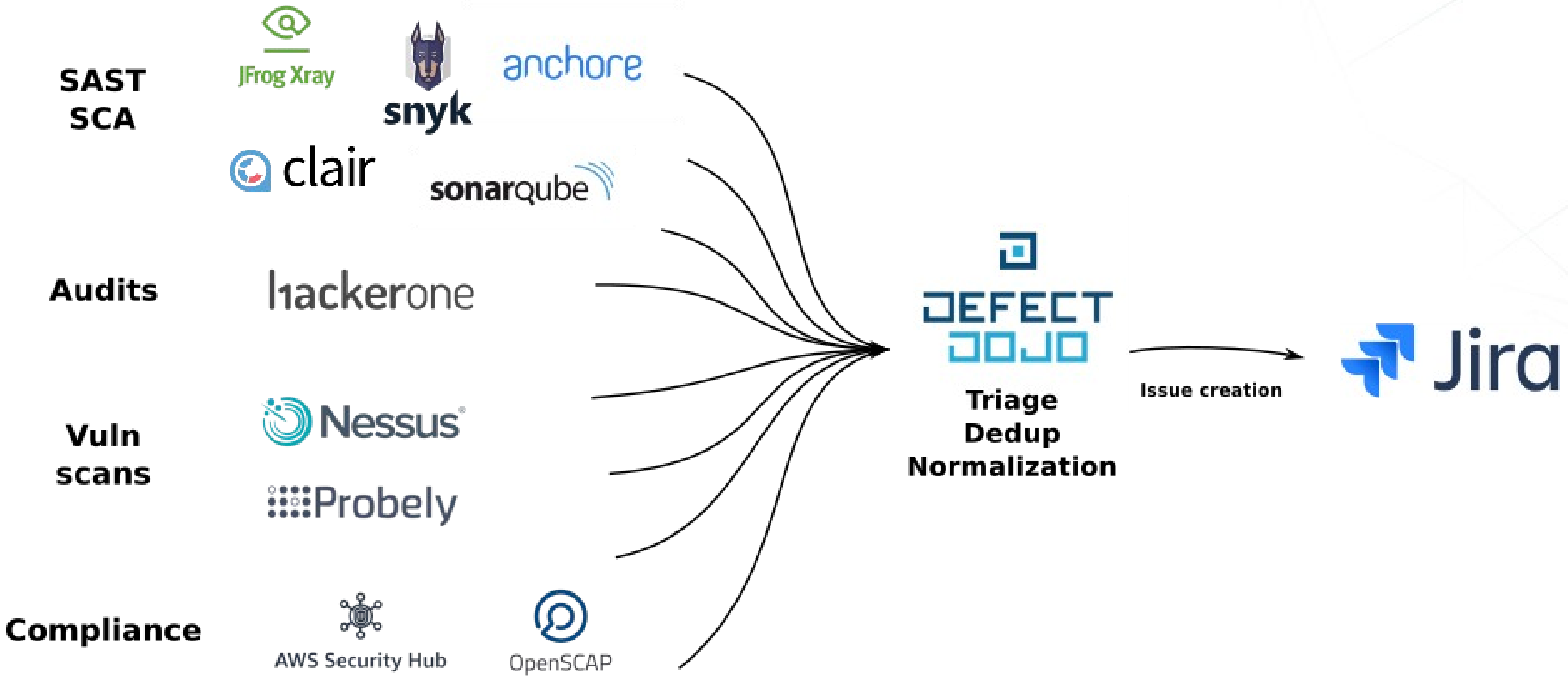


```
<ReportItem port="0" svc_name="general" protocol="tcp" severity="0" pluginID="11936" plu
<description>Using a combination of remote probes (TCP/IP, SMB, HTTP, NTP, SNMP, etc...)
<fname>os_fingerprint.nasl</fname>
<plugin_modification_date>2013/04/01</plugin_modification_date>
<plugin_name>OS Identification</plugin_name>
<plugin_publication_date>2003/12/09</plugin_publication_date>
<plugin_type>combined</plugin_type>
```



```
"cvssScore": 5.9,
"description": "## Overview\r\n[com.google.gua
"disclosureTime": "2018-04-25T07:28:15Z",
"fixedIn": [
  "24.1.1-android",
  "24.1.1-jre"
],
```

Security Defect Management (with Defect Dojo a proposal)



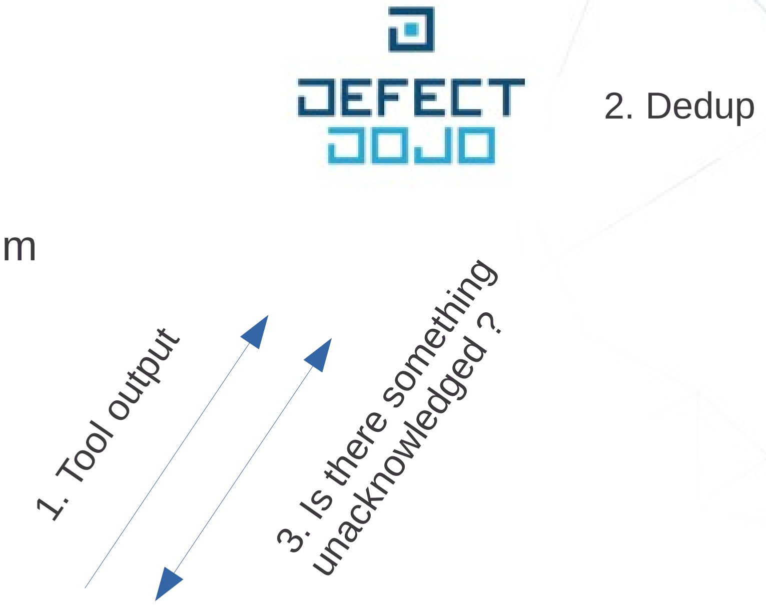
Defect Management at release-time

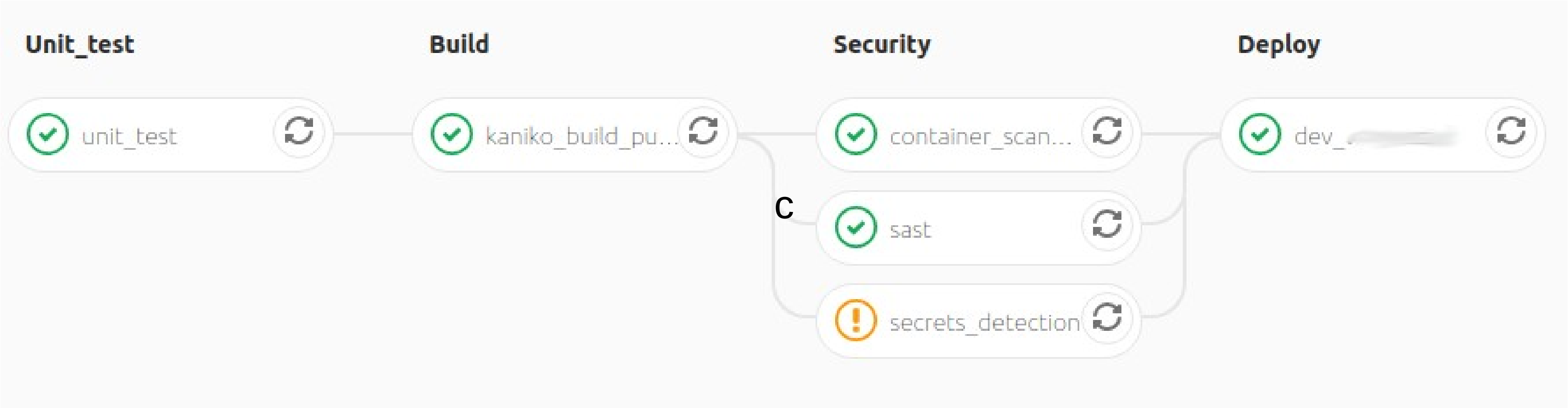
Proposal: track the defects outside the CI/CD pipelines.

Both can now be flagged, inside the defect-management system

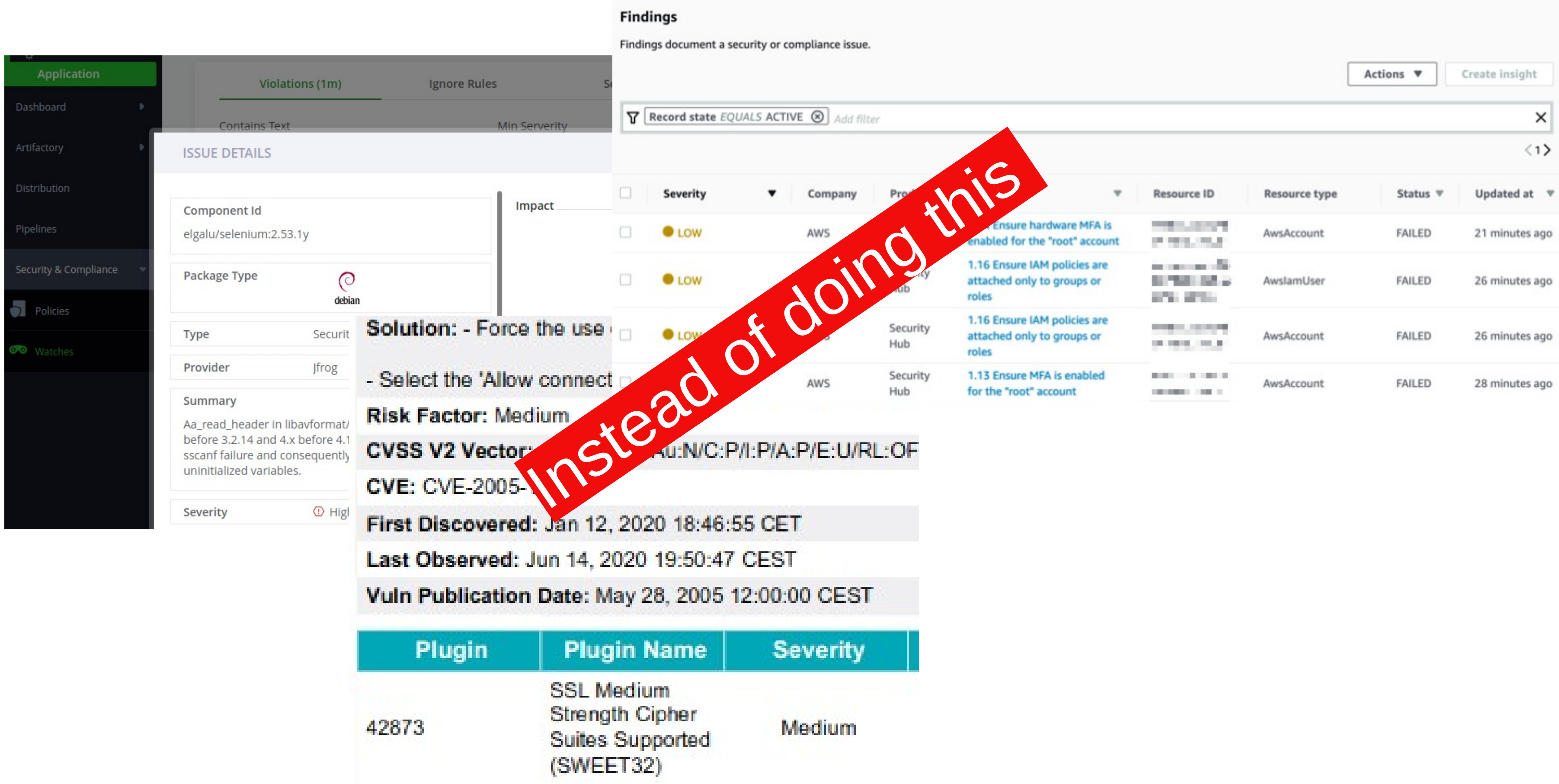
~~- Not always easy to handle false-positives~~

~~- Hard to get “always green” jobs (fatigue)~~





Defect Management at scan-time



Instead of doing this

Component Id	elgalu/selenium:2.53.1y
Package Type	debian
Type	Securit
Provider	Jfrog
Summary	Aa_read_header in libavformat/ before 3.2.14 and 4.x before 4.1 sscanf failure and consequently uninitialized variables.
Severity	Higl

Solution: - Force the use

- Select the 'Allow connect

Risk Factor: Medium

CVSS V2 Vector: Au:N/C:P/I:P/A:P/E:U/RL:OF

CVE: CVE-2005-

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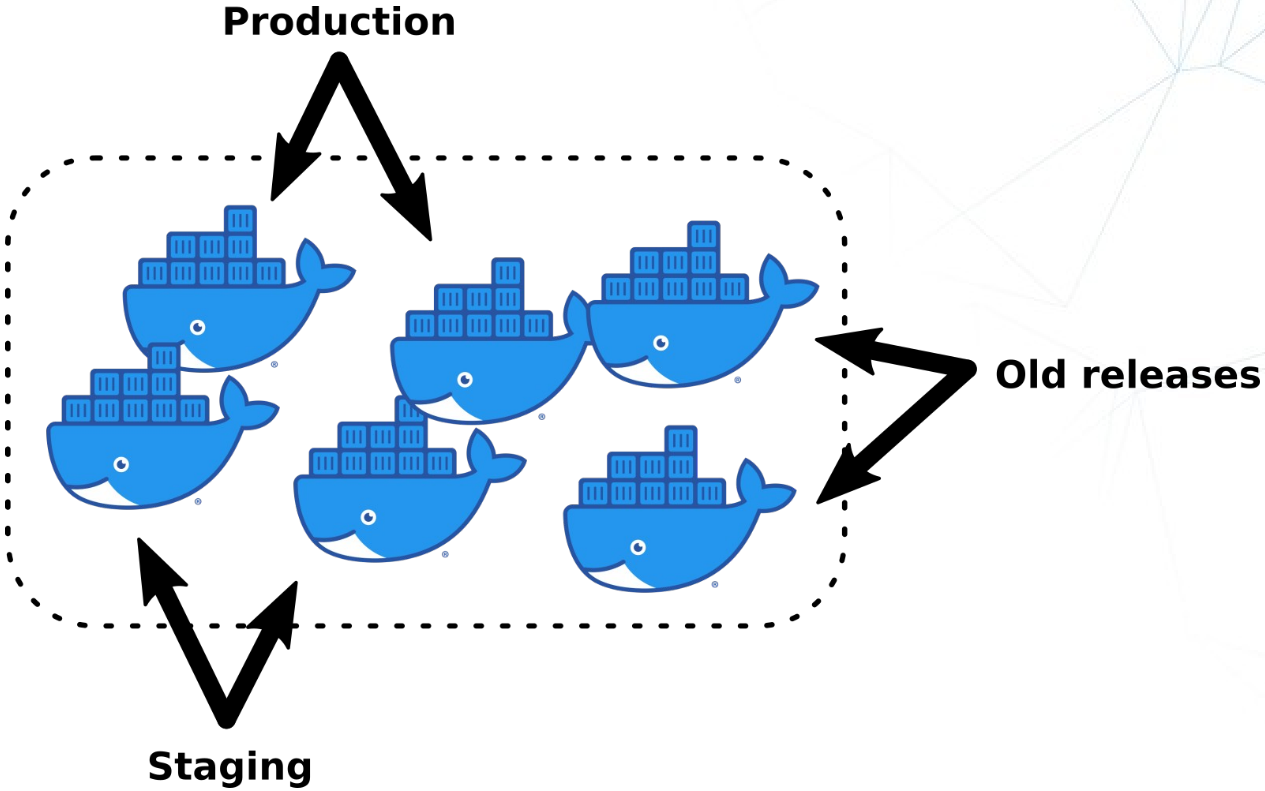
Defect Management at scan-time

Proposal:

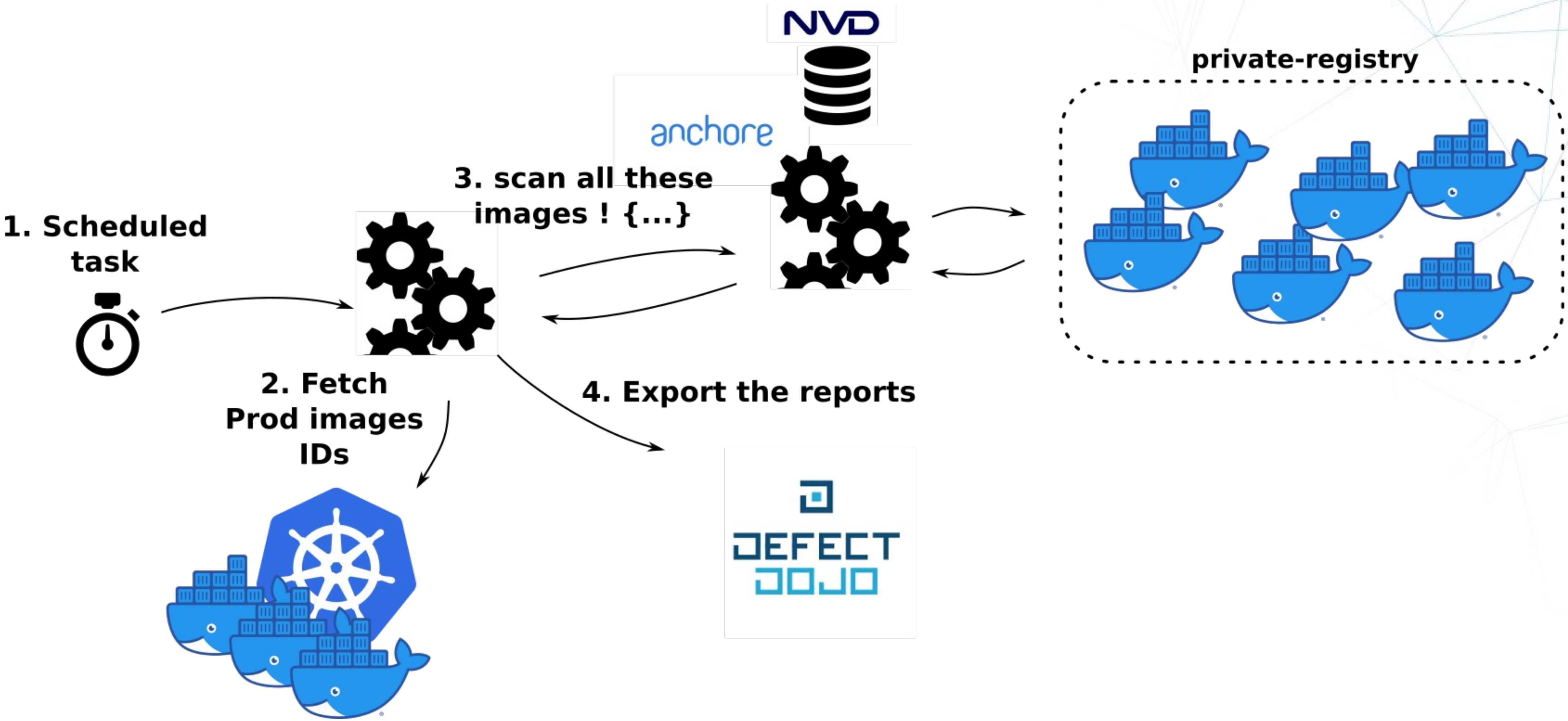
1. Give context to your security defects
2. Scan what make sense
3. Aggregate data close to the defects that are coming from CI/CD pipelines



Ex for containers:

- Scan only containers that are running in production.

Defect contextualization example (K8s + Docker)



1. Scheduled task

2. Fetch Prod images IDs

3. scan all these images ! {...}

4. Export the reports

Ultimately we should have

- A system that aggregates all the information about our products
- That is easy to integrate inside existing teams tools:
  - Gitlab, Jenkins, Jira, ...
- That can give visibility to a broad category of users (devs, po, ciso, …)
- That is easy to use

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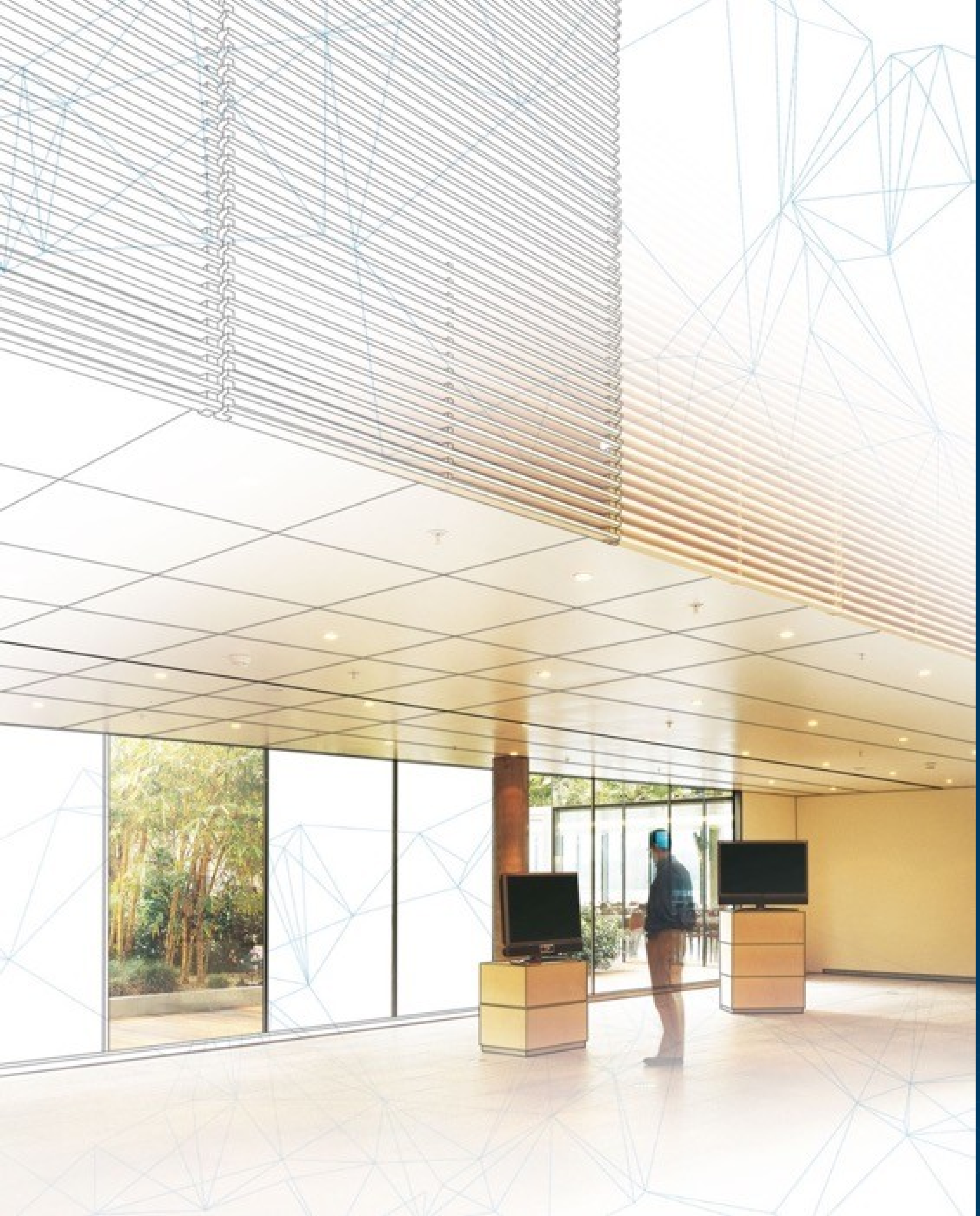
Questions, Ideas ?



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