ALL DAY DEVOPS

NOVEMBER 6, 2019

Jeroen Willemsen

Why Manual Verification Still Matters

About me

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"Security architect"
"Full-stack developer"

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GOAL of Today:
Help you on the next step of your security journey

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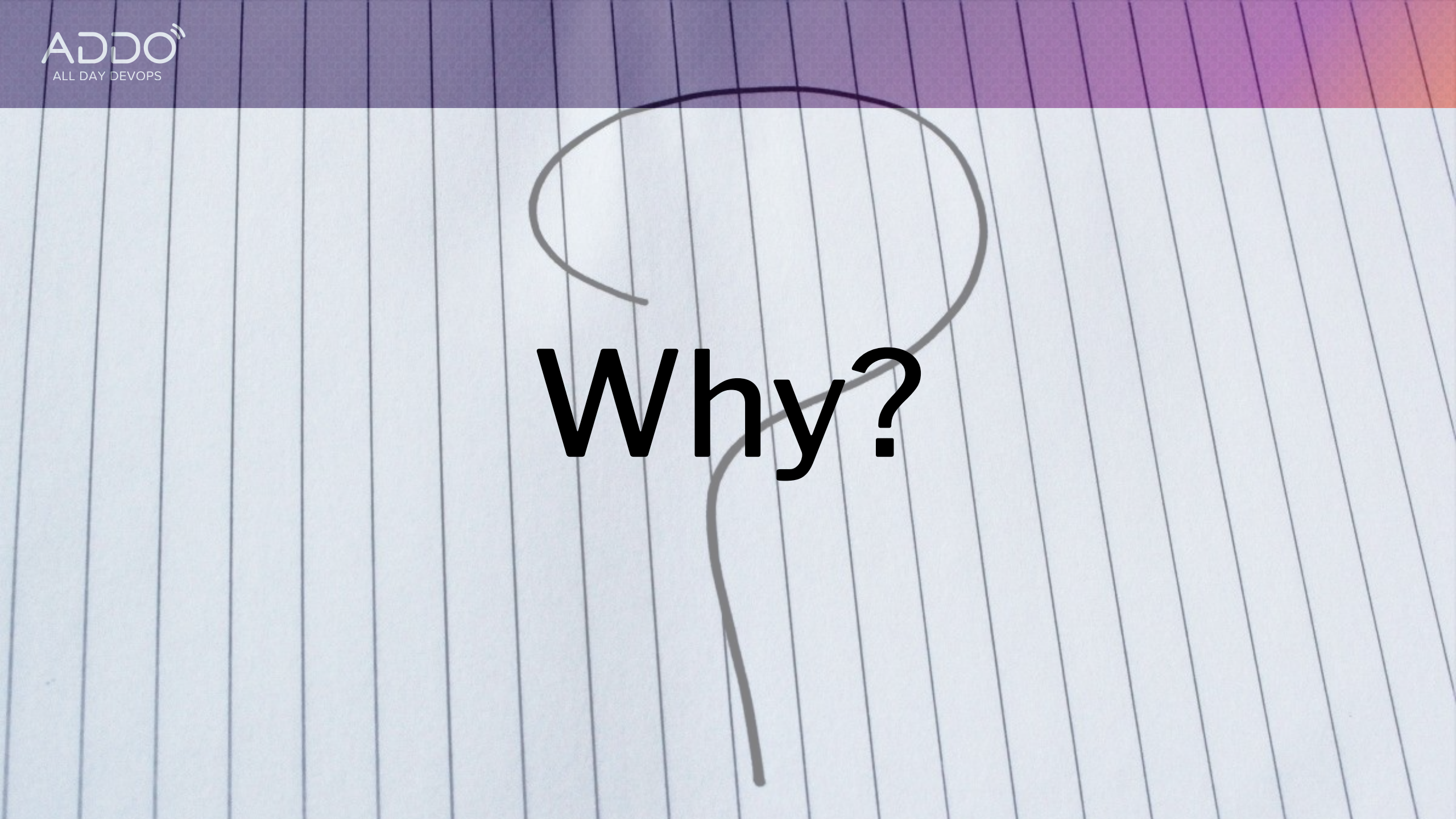
- The application in its runtime
- The container up close
- The container on its platform
- The way forward


Why?

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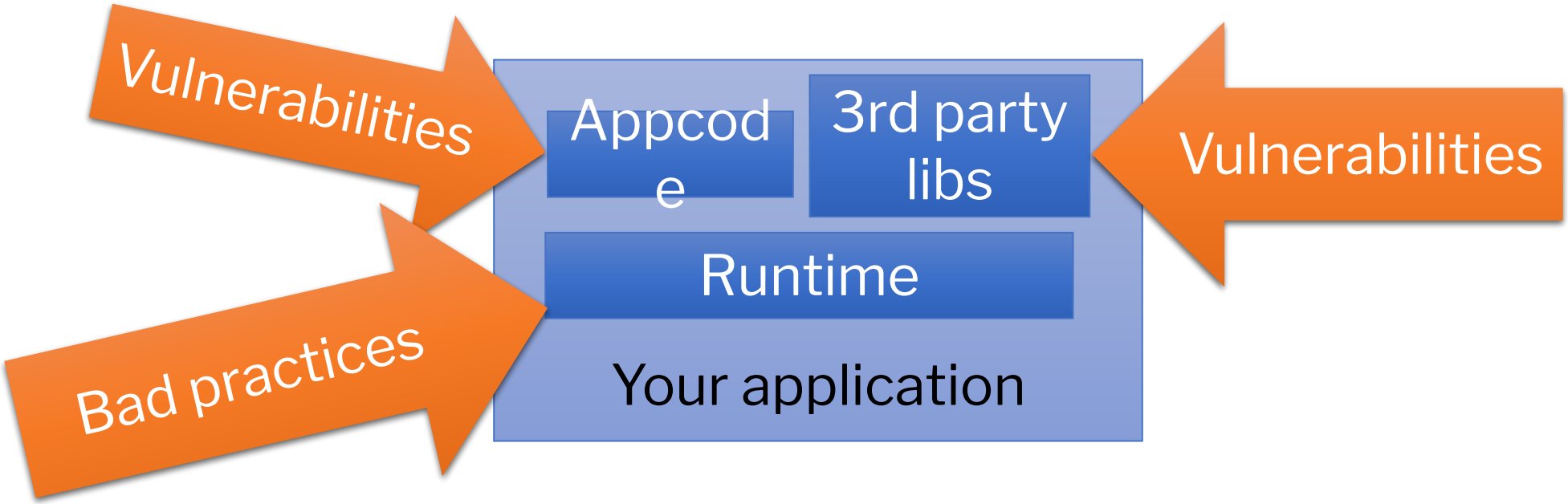

Vulnerabilities
Appcod
e
3rd party
libs
Vulnerabilities
Runtime
Bad practices
Your application

3rd party libs

- Start with a dependency checker!
- Start manual.
- Learn how to verify and how to “fix” it
  - Suppression, replacement, harden/add guards.
- Automate and keep rechecking.

3rd party libs

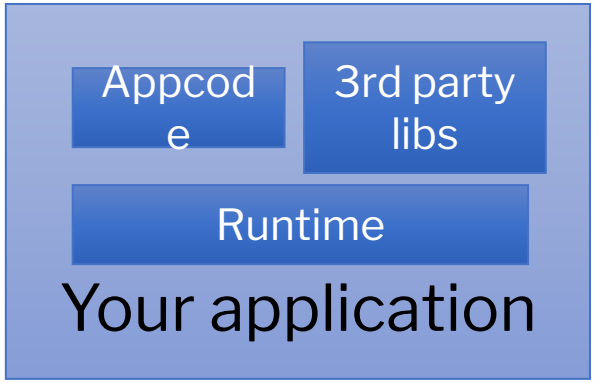
- Not all ecosystems have proper checkers.
- Not finding a CVE does not mean it is not there.
- ***Libraries still need vetting.***
- **Especially: Internal "libraries" need your own vetting!**
- What if it only takes 1 Class?

Appcode

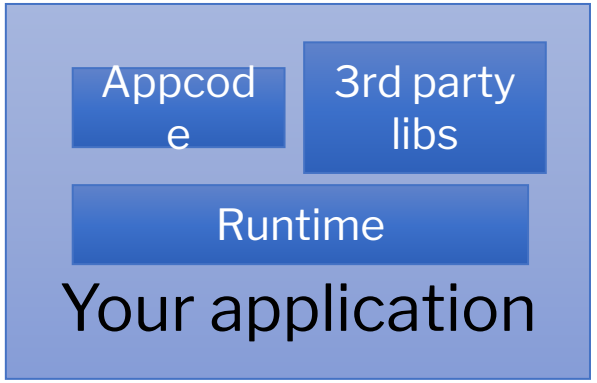
- SAST tooling mileage will vary depending on the language, framework & tooling
  - Always have linters on board!
  - Start manual before automation
  - Have explainable suppression in place
  - Test before buy

Appcode

- Create your own tool / extend existing tools if necessary
- Use GREP!
- ***Manual reviews are king!***
- **Missing authorization? Disclosing information in an error?**



- Want to know how your backends behave in general?
- DAST will
  - help finding missing headers;
  - detect some of the obvious missed XSS/SQLI;
  - create a lot of false positives;
  - create a lot of false negatives due to reach and recoginition.



- Don’t want to burn yourself against an earlier finding?
  - Write a security test

- Write security tests based on evil user stories.

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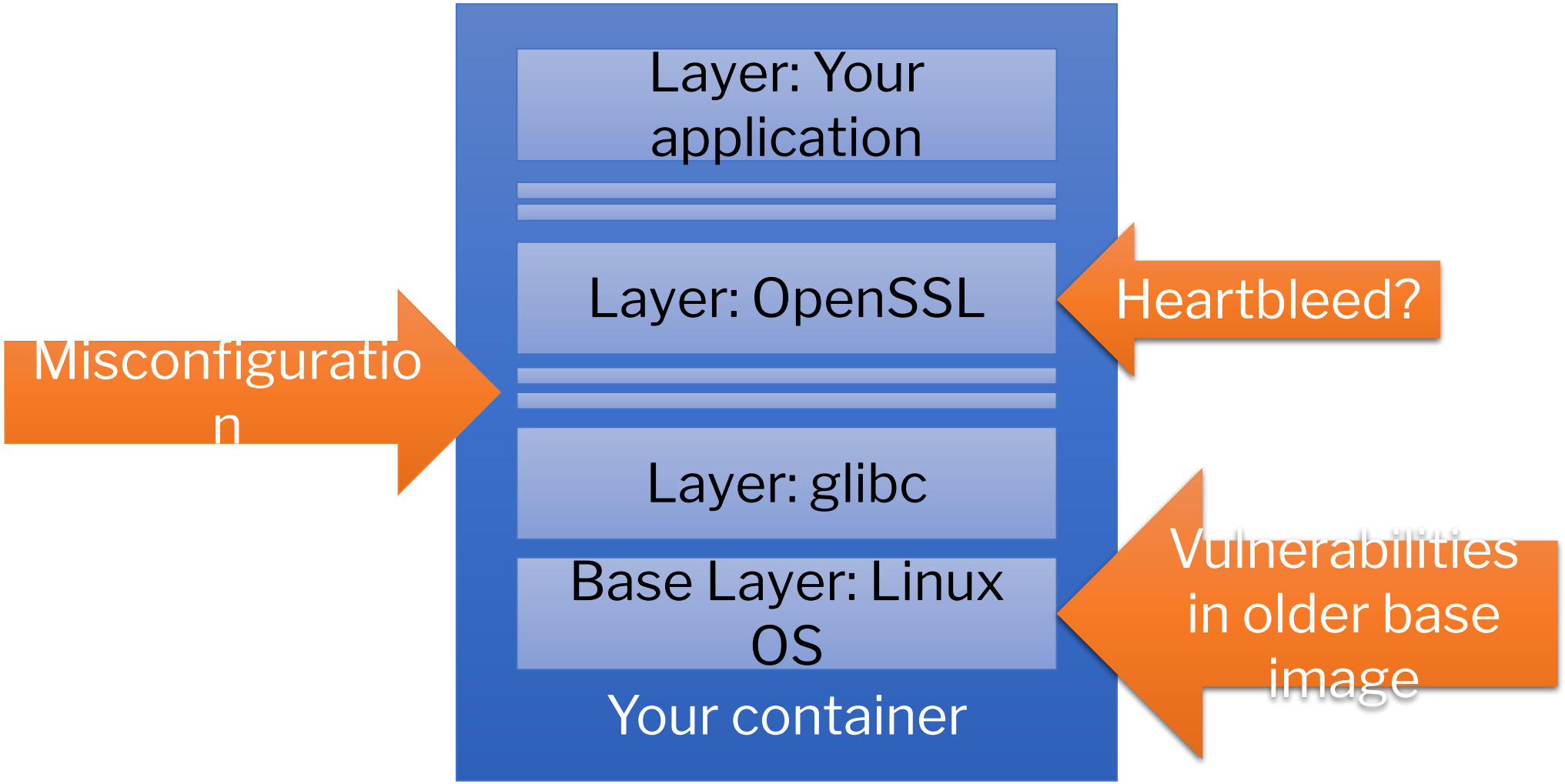
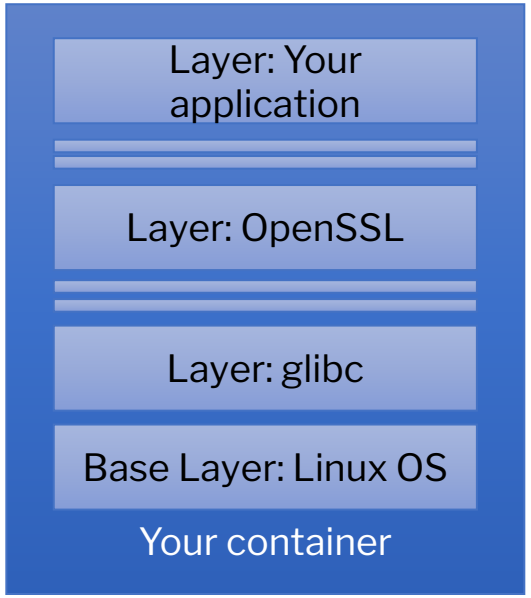
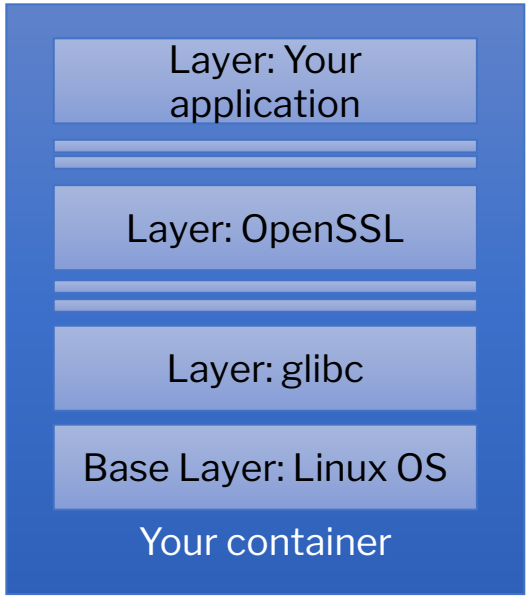
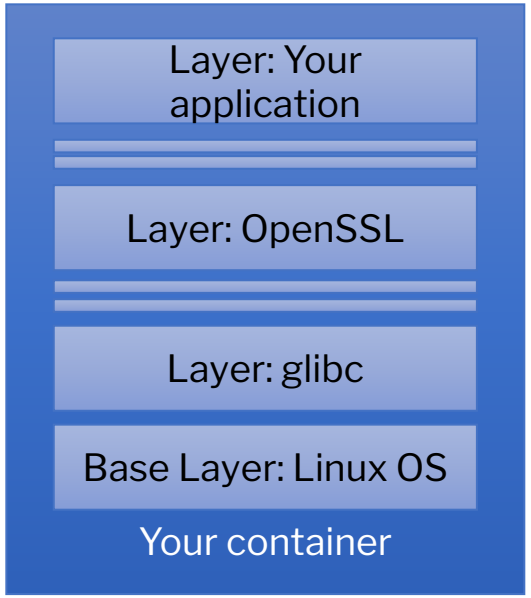

Layer: Your application
Layer: OpenSSL
Layer: glibc
Base Layer: Linux OS
Your container
Misconfiguration
Heartbleed?
Vulnerabilities in older base image



- Analyzing layers for vulnerabilities with Clair/Anchore gives great first insight
  - Start manual, then automate
  - Keep retesting: a CVE might pop up in a later stage.
  - Focus on base-images!
  - **But what about unknown binaries?**

- What about configuration mistakes?
  - Lynis/inspec to the rescue.
  - Create your own target profile!
  - Focus on base-images and verify on change!
  - Profiles require maintenance.





- What about configuration mistakes?
  - Dockle/hadolint on a syntax level.
  - Focus on base-images and verify on change!

- It might not find your private key in the container.

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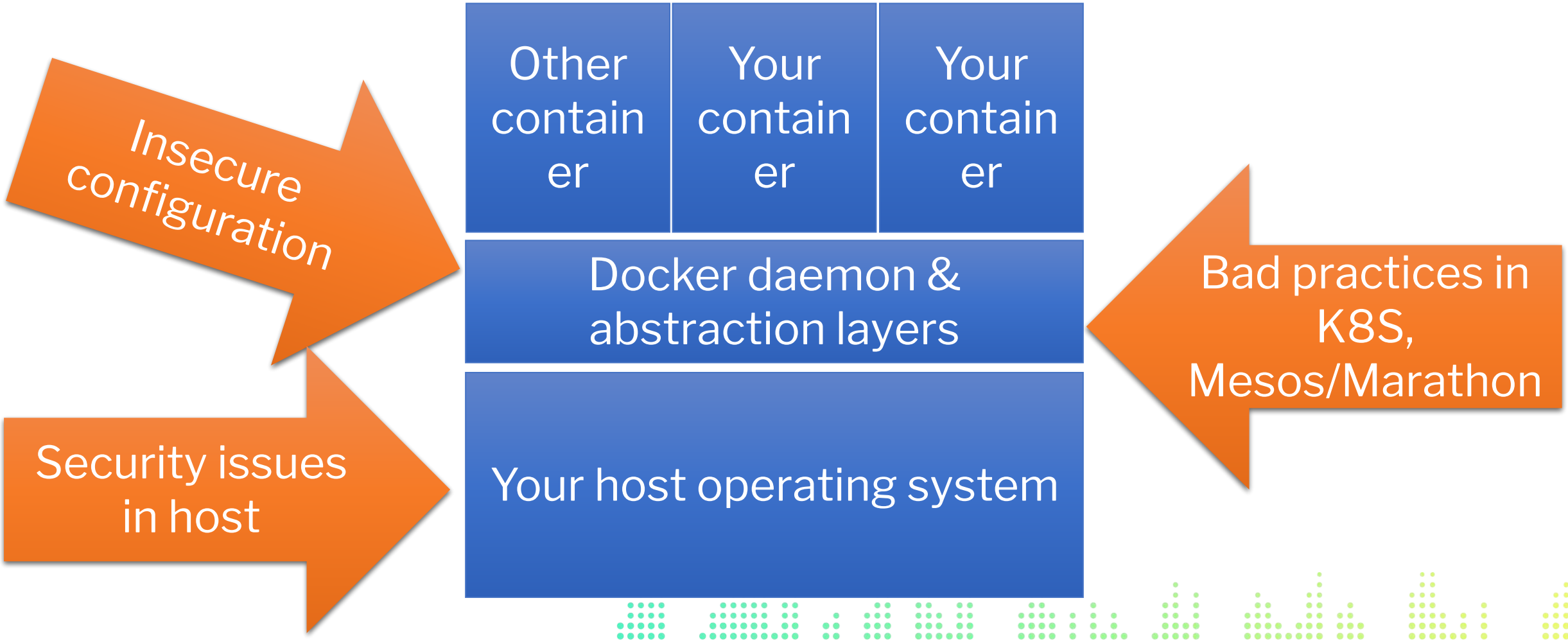
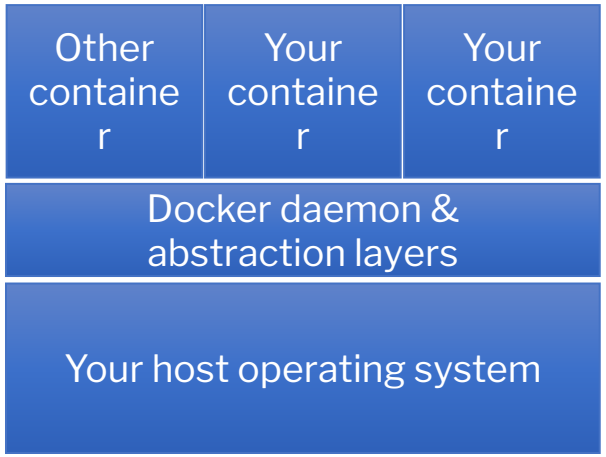
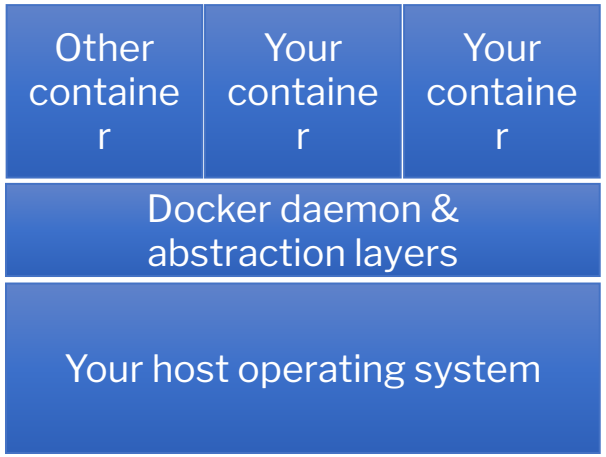

Insecure configuration
Security issues in host
Other container
Your container
Your container
Docker daemon & abstraction layers
Your host operating system
Bad practices in K8S, Mesos/Marathon



- Take the hygiene steps first:
  - CIS Benchmarks through Inspec/ciscat
  - Lynis/Openscap on your system
  - Check for vulnerabilities: OpenVAS or Nessus
  - Other commercial tools



- Immutability is king
- Fat hosts often have too much attack surface out of sight
- ***The richer the host, the more checking is required***

General issues

- Secrets leaked
- Network issues
- IAM issues
- “Cloud” hosting configuration

Secrets leaked

- Start with the sources (trufflehog)
- Check the containers (grep, tooling)
- Check the virtual machine images
- Check the runtimes
- Check the CI/CD pipeline
- VALIDATE the process, then the tooling

Network issues

- Keep it simple: start by “deny by default”
- Start as managed as possible: cloud providers offer tooling
- Not in the cloud? Use tools like nmap

- TLS and such? Use checkssl.sh and alike
- **Allways check for “unexpected” infiltration/exfiltration paths.**

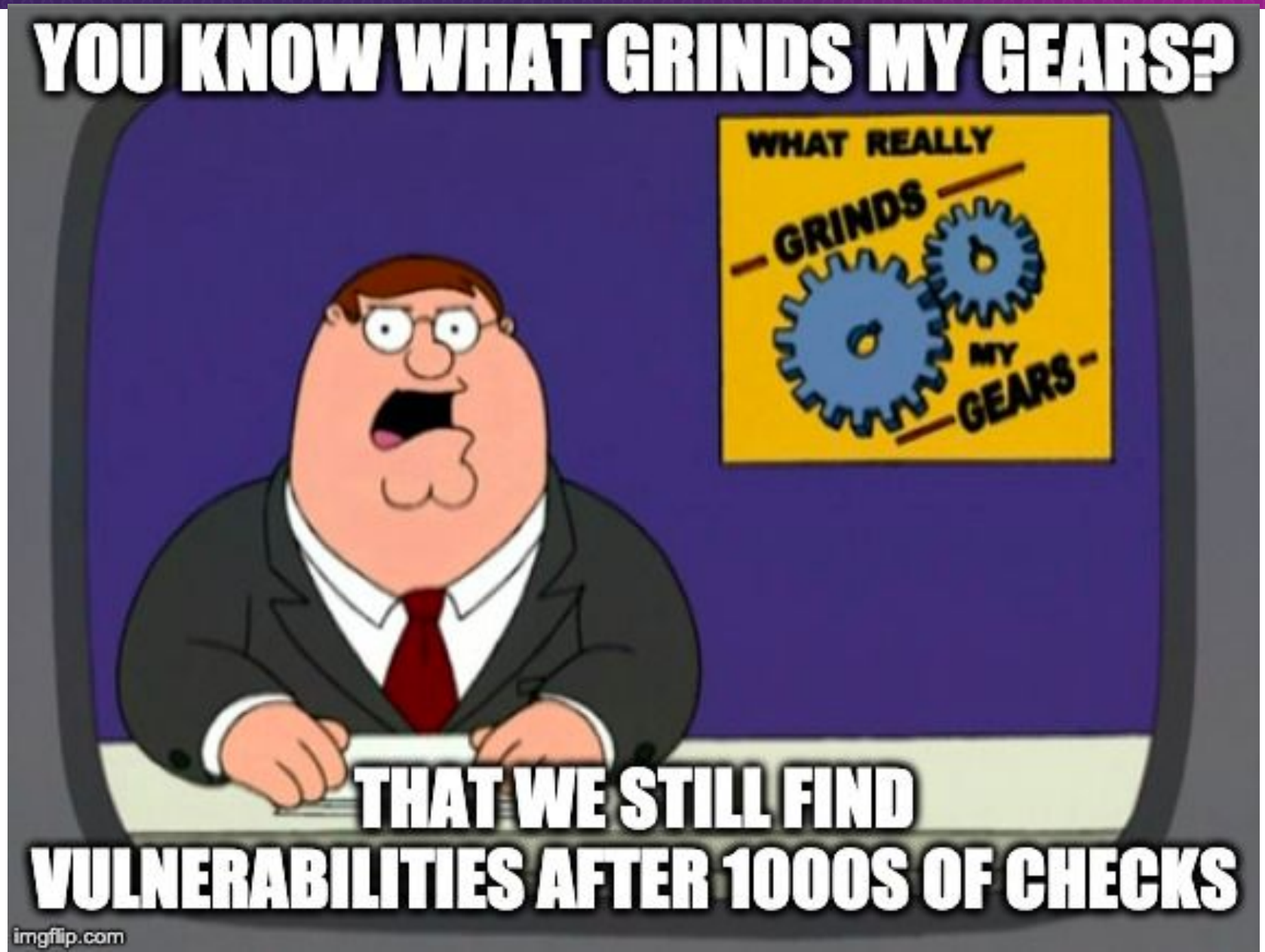
IAM issues

- Different environments require different tools
  - Application level
  - Host level
  - Cloud provider level
- When is something too broad? When is something too fine grained?
- ***Still you will need manual reviews for compliance and toxicisity.***
- ***User having access to all environments***

"Cloud" hosting configuration

- Various cloud providers have their own tooling ecosystem
- Cloud custodian is "cross-cloud"
- Using terraform? Check tools like terraform-compliance
- Run them on every check
- ***Manual verification of effective cloud configration is always necesseary***
- ***The too open network design?***


I have to automate more
CHANGE MY MIND
imgflip.com


YOU KNOW WHAT GRINDS MY GEARS?
WHAT REALLY
GRINDS
MY
GEARS
THAT WE STILL FIND
VULNERABILITIES AFTER 1000S OF CHECKS
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The Way Forward

- Automate as much as you can!

- ***Manual verification matters:***
  - We cannot catch every mistake
  - We learn about “new mistakes”

- Take risk based actions: it’s easy to drown in the pool of todo’s.

Questions?

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Thank you!

@commjoenie

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