

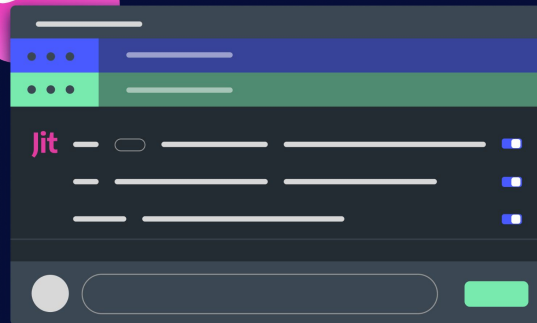
Jit

DSOMM from Theory to Enforcement

OWASP DevSecOps Maturity Model

Raz Probstein, Solution Engineer at Jit

August 3rd, 2023



{ }

</>

↑↑↑



I'm **Raz Probstein**

Solution Engineer at **Jit**
Continuous Security Platform for Developers

Developer, Tech, Security, BioTech Advocate



DSOMM from Theory to Enforcement



OWASP Devsecops Maturity Model

- Security Maturity Models – Overview and Background
- What is DSOMM?
- Operationalizing DSOMM
- Automated Continuous Security Approach
- Q/A

Security Maturity Models

Overview and Background

Leading Security Maturity Models

What images to **Security Maturity Models** bring to mind?

Security Maturity Models

Overview and Background

Leading Security Maturity Models

What images to **Security Maturity Models** bring to mind?



Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!



Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Current State
Analysis

Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Current State
Analysis

Gap
Prioritization

Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Tools &
Automation

Current State
Analysis

Gap
Prioritization

Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Tools &
Automation

Current State
Analysis

Resource
Needs

Gap
Prioritization

Security Maturity Models

Overview and Background

Leading Security Maturity Models

But Wait! There can be significant value when implemented well!

Translation to
Leadership

Tools &
Automation

Current State
Analysis

Resource
Needs

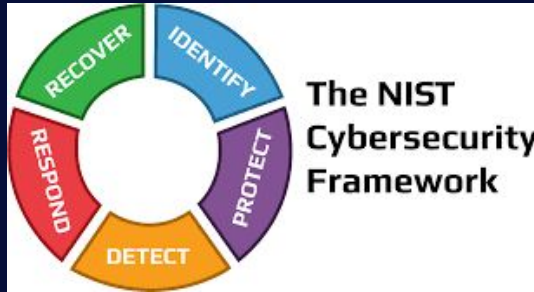
Gap
Prioritization

Risk
Exposure

Security Maturity Models

Overview and Background

Leading Security Maturity Models

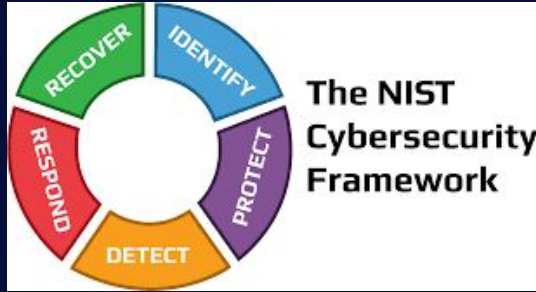


NIST

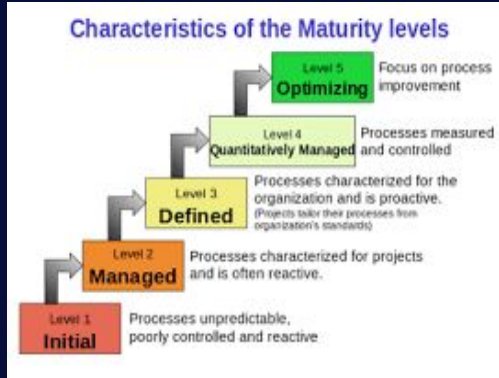
Security Maturity Models

Overview and Background

Leading Security Maturity Models



NIST



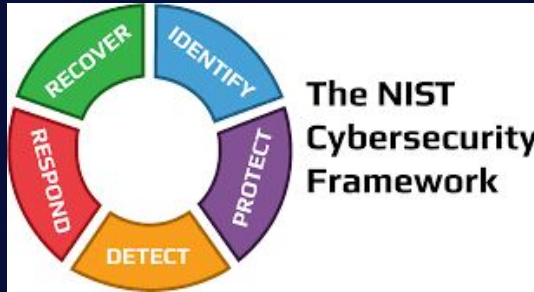
CMMI

Security Maturity Models

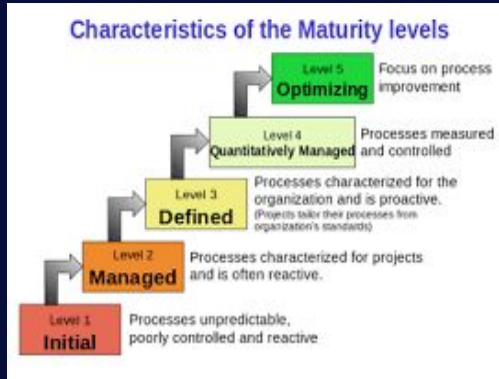
Overview and Background



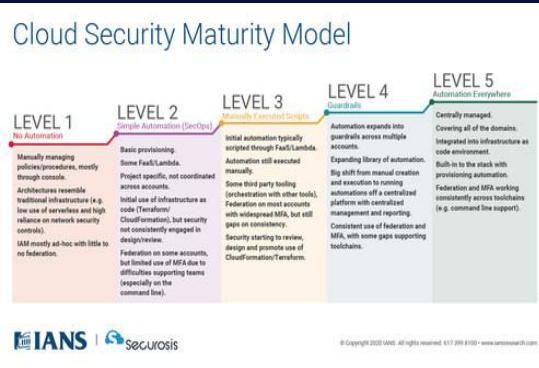
Leading Security Maturity Models



NIST



CMMI

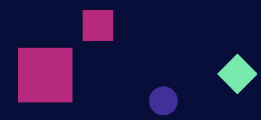


CSA

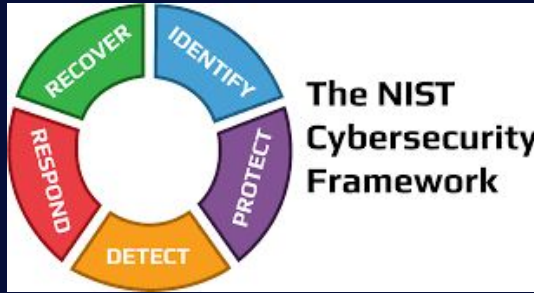
Jit

Security Maturity Models

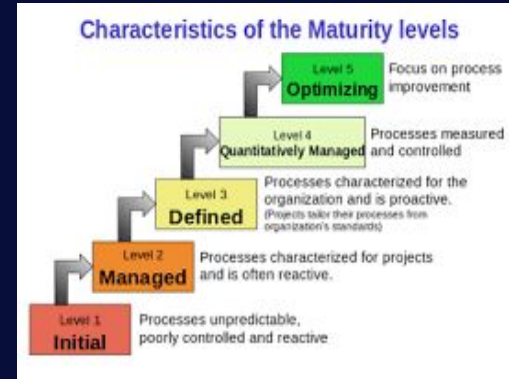
Overview and Background



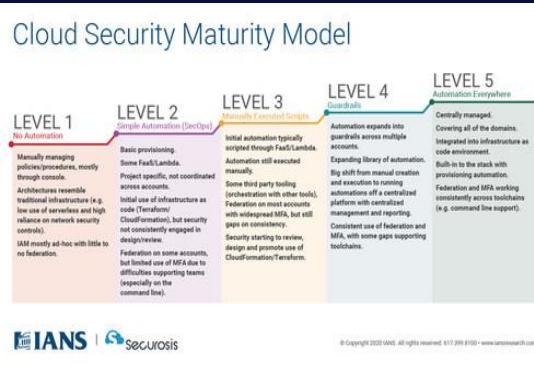
Leading Security Maturity Models



NIST



CMMI



CSA

Check out the OWASP SAMM v2 model [online](#):

Business functions	Governance	Design	Implementation	Verification	Operations
Practices	Strategy & Metrics Governance & Metrics Policy & Compliance Education & Guidance	Threat Assessment Security Requirements Secure Architecture	Secure Build Secure Deployment Defect Management	Architecture Assessment Requirements-driven Testing Security Testing	Incident Management Environment Management Operational Management
	Threat Assessment Security Requirements Secure Architecture Architecture Assessment Requirements-driven Testing Security Testing Incident Management Environment Management Operational Management	Threat Assessment Security Requirements Secure Architecture Architecture Assessment Requirements-driven Testing Security Testing Incident Management Environment Management Operational Management	Threat Assessment Security Requirements Secure Architecture Architecture Assessment Requirements-driven Testing Security Testing Incident Management Environment Management Operational Management	Threat Assessment Security Requirements Secure Architecture Architecture Assessment Requirements-driven Testing Security Testing Incident Management Environment Management Operational Management	Threat Assessment Security Requirements Secure Architecture Architecture Assessment Requirements-driven Testing Security Testing Incident Management Environment Management Operational Management

OWASP SAMM

Jit

Security Maturity Models

Overview and Background



Leading Security Maturity Models

Why we like DSOMM at Jit?

Security Maturity Models

Overview and Background



Leading Security Maturity Models

Why we like DSOMM at Jit?

Open Source

We value open source tools and processes and Jit as a source for consistently maintained and independent resources

Security Maturity Models

Overview and Background



Leading Security Maturity Models

Why we like DSOMM at Jit?

Open Source

We value open source tools and processes and Jit as a source for consistently maintained and independent resources

Developer Owned

As an elite / high performing development team, we need a maturity framework that aligns with our organizational approach

Security Maturity Models

Overview and Background



Leading Security Maturity Models

Why we like DSOMM at Jit?

Open Source

We value open source tools and processes and Jit as a source for consistently maintained and independent resources

Developer Owned

As an elite / high performing development team, we need a maturity framework that aligns with our organizational approach

Automation & Tooling

DSOMM can be integrated with technology and tools to support automated assessment and tracking

Security Maturity Models

Overview and Background



Leading Security Maturity Models

Why we like DSOMM at Jit?

Open Source

We value open source tools and processes and Jit as a source for consistently maintained and independent resources

Developer Owned

As an elite / high performing development team, we need a maturity framework that aligns with our organizational approach

Automation & Tooling

DSOMM can be integrated with technology and tools to support automated assessment and tracking

Stakeholder Value

DSOMM provides value to company across leadership, team leads, developers and external stakeholders

What is DSOMM?

OWASP DevSecOps Maturity Model

Focused on Security & DevOps
Strategies

Based on need for Security
Prioritization for Developers



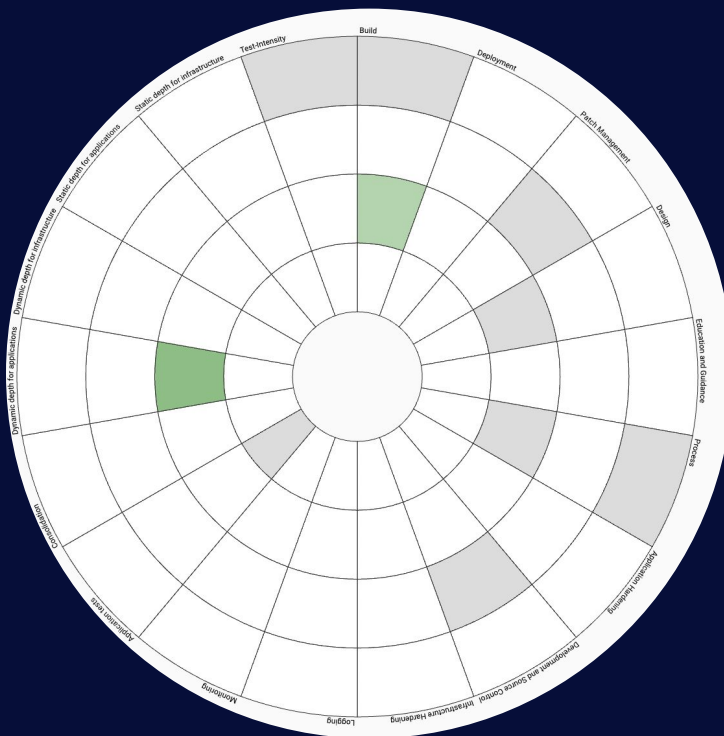
Developed by [Timo Pagel](#) in 2017

Jit

What is DSOMM?

OWASP Devsecops Maturity Model

Defines Maturity Levels specific to Software Development

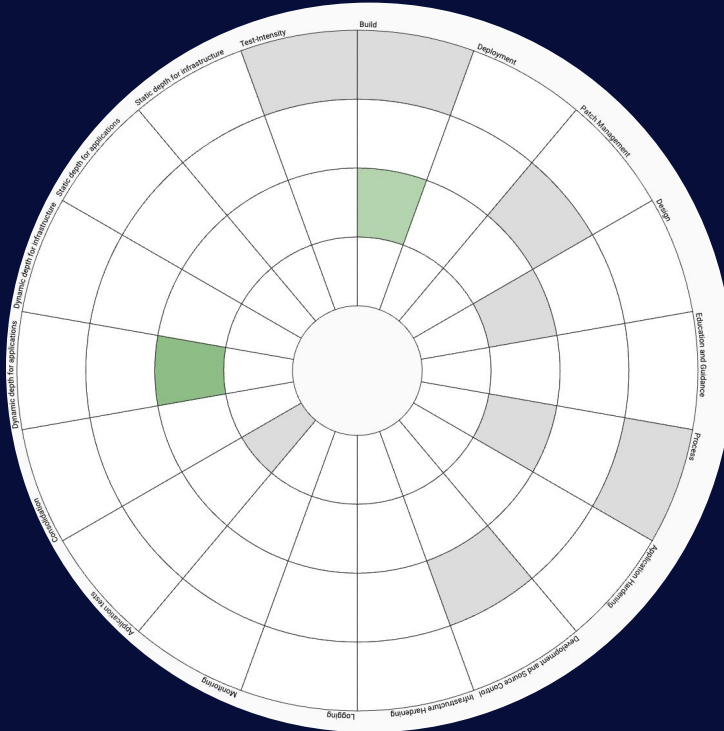


What is DSOMM?

OWASP Devsecops Maturity Model



Provides **Security Dimensions and Levels** specific to software development



What is DSOMM?

OWASP Devsecops Maturity Model



Dimensions

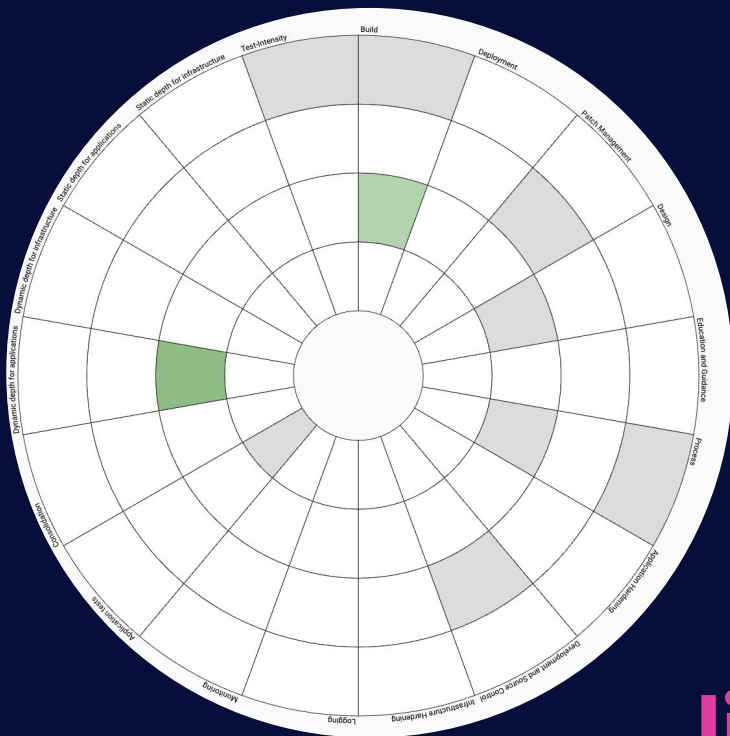
Build & Deployment

Culture & Organization

Implementation

Information Gathering


Test & Verification



What is DSOMM?

OWASP Devsecops Maturity Model

Each Dimension provides a sub-dimension with (up to) four distinct maturity levels to assess and track maturity across your DevSecOps lifecycle

Dimension	Sub-Dimension	Level 1: Basic understanding of security practices	Level 2: Adoption of basic security practices	Level 3: High adoption of security practices	Level 4: Advanced deployment of security practices at scale
 Build and Deployment	Build	<ul style="list-style-type: none">Defined build process	<ul style="list-style-type: none">Building and testing of artifacts in virtual environmentsPinning of artifactsSBOM of components	<ul style="list-style-type: none">Signing of artifactsSigning of code	
 Build and Deployment	Deployment	<ul style="list-style-type: none">Defined deployment process	<ul style="list-style-type: none">Defined decommissioning processEnvironment depending configuration parameters (secrets)Usage of trusted images	<ul style="list-style-type: none">Handover of confidential parametersInventory of dependenciesInventory of running artifactsRolling update on deploymentSame artifact for environmentsUsage of feature toggles	<ul style="list-style-type: none">Blue/Green Deployment

What is DSOMM?

OWASP Devsecops Maturity Model



Alive?

Operationalizing DSOMM

Automation focus areas from DSOMM



With the excellent open source tooling available today the following technical dimensions of DSOMM can be practically enabled *and even automated quickly*

Dimension	Sub-Dimension
Implementation	Application Hardening
Implementation	Development & Source Control
Test & Verification	Application Tests
Test & Verification	Consolidation

Operationalizing DSOMM



Implementation - Application Hardening

DSOMM provides the following maturity levels for application hardening both for software development and supplier security:

Maturity level		Stream A Software Requirements	Stream B Supplier Security
1	Consider security explicitly during the software requirements process.	High-level application security objectives are mapped to functional requirements.	Evaluate the supplier based on organizational security requirements.
2	Increase granularity of security requirements derived from business logic and known risks.	Structured security requirements are available and utilized by developer teams.	Build security into supplier agreements in order to ensure compliance with organizational requirements.
3	Mandate security requirements process for all software projects and third-party dependencies.	Build a requirements framework for product teams to utilize.	Ensure proper security coverage for external suppliers by providing clear objectives.

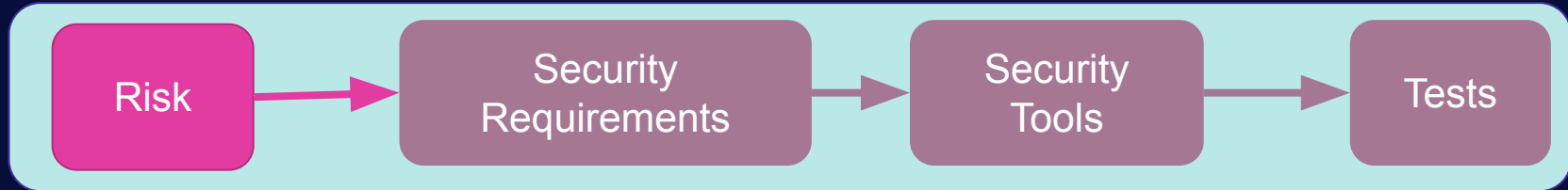
Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1

Consider security explicitly during the software requirements process



Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Software Requirements: High level application security objectives are mapped to functional requirements



Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Application Security Objective: Prevent data or code within the app from being stolen or hijacked



Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Software Requirements: High level application security objectives are mapped to functional requirements

Functional & Organization Security Requirements:

- 1. Scan Code for Vulnerabilities**
- 2. Scan Code for Hard-Coded Secrets**

Operationalizing DSOMM



Implementation - Application Hardening

Maturity Level 1 - Consider security explicitly during the software requirements process

Supplier Requirements: Evaluate the supplier based on organization security requirements



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 1 - Consider security explicitly during the software requirements process



Organization Security Requirements: All software libraries are updated with vulnerabilities remediated



Operationalizing DSOMM

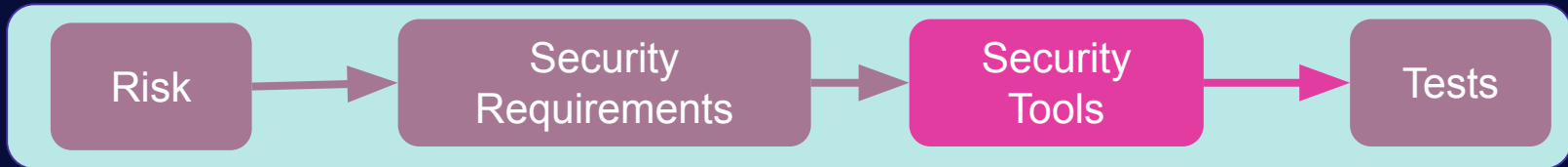
Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Functional & Organization Security Requirements:

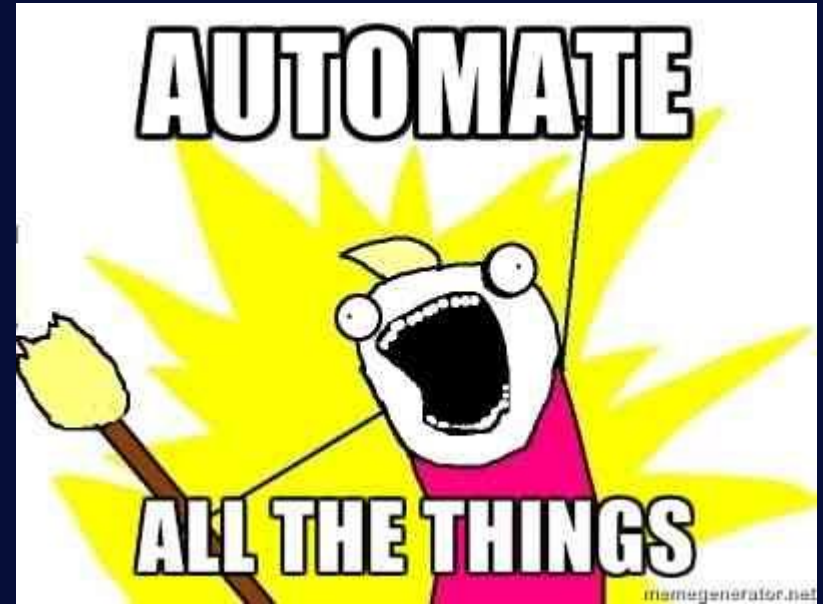
1. Scan Code Dependencies for Vulnerabilities:



Operationalizing DSOMM



Let's automate implementation of DSOMM maturity levels using OSS security tools!



Operationalizing DSOMM



Trivy



Bandit



Kubescape

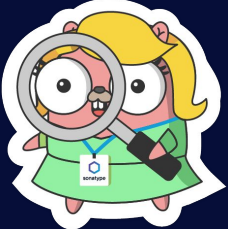


Semgrep



Gosec

Operationalizing DSOMM



Nancy



Operationalizing DSOMM

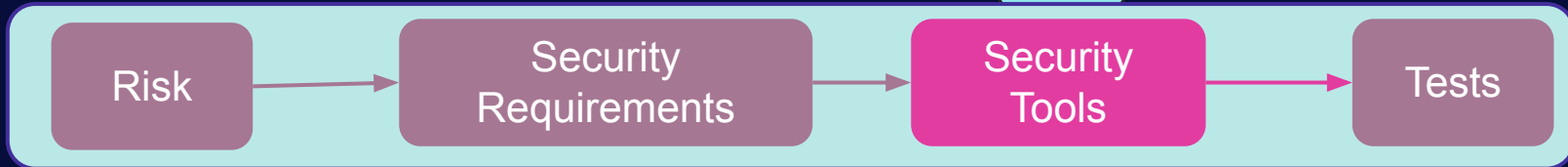
Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Scan Code for Vulnerabilities:

a. GoSec: Go



Operationalizing DSOMM

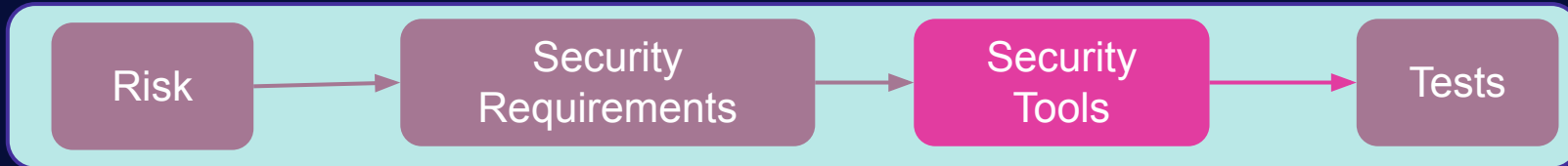
Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

Scan Code for Vulnerabilities:

- a. **GoSec:** Go
- b. **SemGrep:** Python, Java, JavaScript, TypeScript, Kotlin, Scala, C#



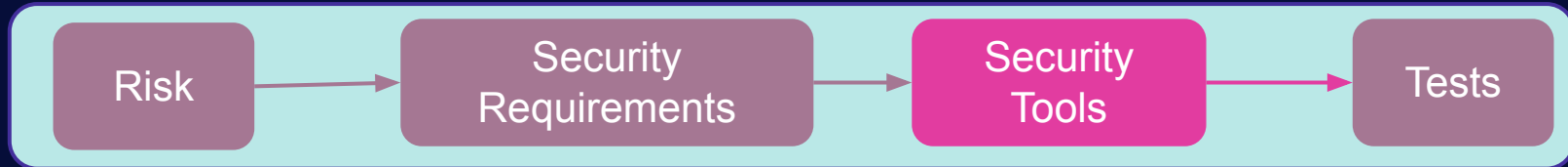
Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

a. OSV-Scanner: Python, PHP



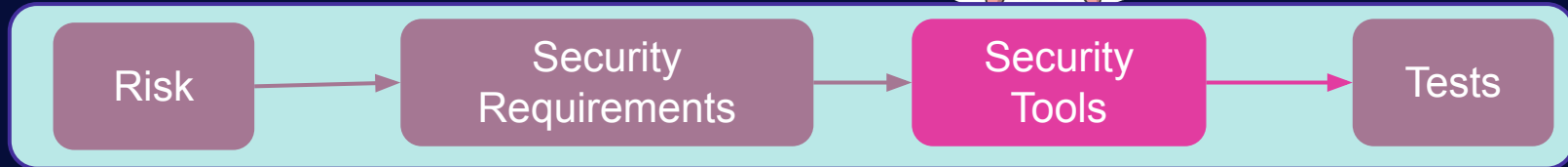
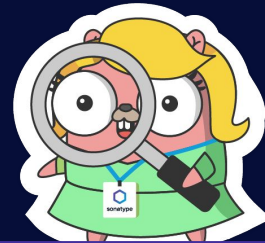
Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

- a. OSV-Scanner: Python, PHP
- b. Nancy: Go



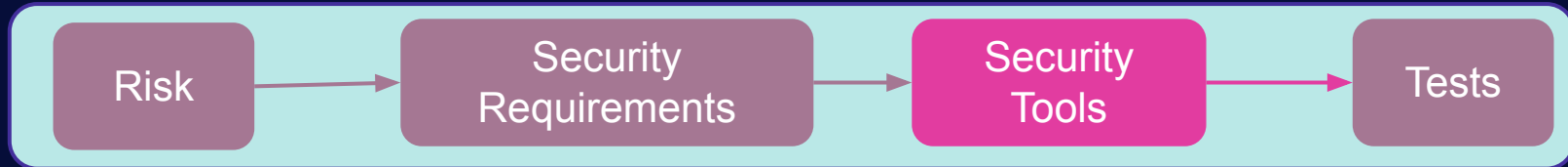
Operationalizing DSOMM

Implementation - Application Hardening



Maturity Level 1 - Consider security explicitly during the software requirements process

- a. **OSV-Scanner: Python, PHP**
- b. **Nancy: Go**
- c. **npm-audit: Javascript, Typescript, Node JS**



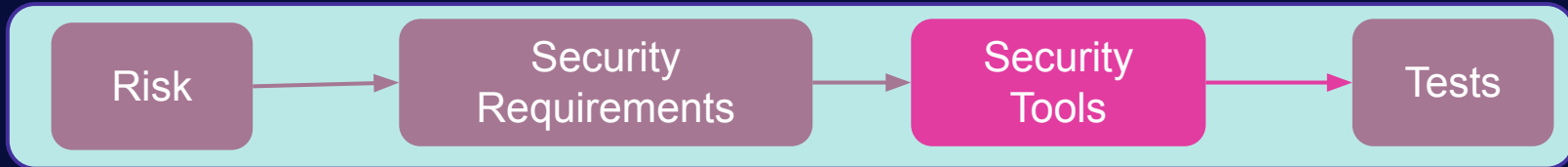
Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 1 - Consider security explicitly during the software requirements process

Scan Code for Hard-Coded Secrets:

- a. **GitLeaks:** Supports multiple languages



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 2

Increase granularity of security requirements derived from business logic and known risks



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 2

Increase granularity of security requirements derived from business logic and known risks

- ✔ **Software Requirements:** Structured security requirements are available and utilized by developer teams



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 2

Increase granularity of security requirements derived from business logic and known risks



Software Requirements: Structured security requirements are available and utilized by developer teams

- ✔ **Supplier Requirements:** Build security into supplier agreements in order to ensure compliance with organizational requirements



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 3

Mandate security requirements for all software projects and third party dependencies

- ✓ **Software Requirements:** Build a requirements framework for product teams to utilize



Operationalizing DSOMM

Implementation - Application Hardening

Maturity Level 3

Mandate security requirements for all software projects and third party dependencies



Software Requirements: Build a requirements framework for product teams to utilize

- ✔ **Supplier Requirements:** Ensure proper security coverage for external suppliers by providing clear objectives



Operationalizing DSOMM



Yayyy!

**Our first sub-dimension is
completed!**

Operationalizing DSOMM



Implementation - Development & Source Control

Maturity Level 1 - Source Control Protection & Versioning

- SCM implementation through GitHub

Maturity Level 2 & 3 - Pre-Commit checks and validations

- Enable code scans from Application Hardening sub-domain and enable / enforce Branch Protection

Maturity Level 4 - Local development linting & style checks performed

- Require developers to install and run linter on local IDE



Operationalizing DSOMM

Implementation - Development & Source Control



Maturity Level 1 - Source Control
Protection & Versioning



Operationalizing DSOMM

Implementation - Development & Source Control



Maturity Level 1 - Source Control
Protection & Versioning



Maturity Level 2 & 3 - Pre-Commit
checks and validations



Open Source
Vulnerabilities



Operationalizing DSOMM

Implementation - Development & Source Control



Maturity Level 4 - Local development linting & style checks performed

EXPLORER ... Extension: Jit Security - Vulnerability Scanning for Python, JavaScript, TypeScript, GoLang, Terraform, CloudFu ...

OPEN EDITORS
Extension: Jit Security - Vu...

ANALYTICS-SERVICE
OUTLINE
TIMELINE

Jit Security - Vulnerability Scanning
Jit Security [jit.io](#) | 114 | ★★★★★ (4.1) Average rating: 5 out of 5
Born left and stay secure. Keep your software safe from potenti...
[Enable](#) [Uninstall](#) ⚙️
This extension is disabled globally by the user.

DETAILS FEATURE CONTRIBUTIONS CHANGELOG

Jit Security

With Jit, you don't need to be a security expert to consistently write secure code.

The Jit Security extension enables you to access the power of [JIT](#) directly from your IDE.

No additional security tools are required to enhance the security of your project with Jit.

Safeguard your code by identifying and fixing vulnerabili... you work.

Categories
Programming Languages
Linters Other

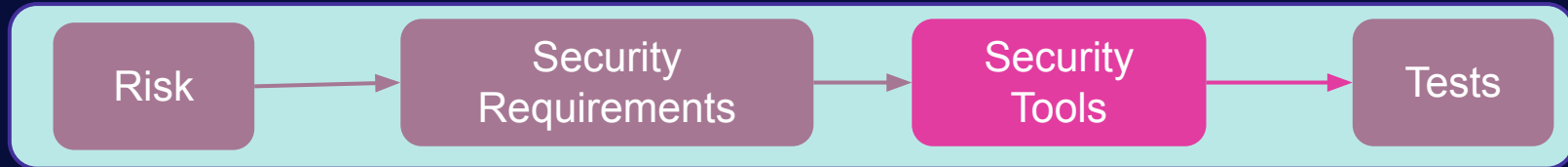
Extension Resources
[Marketplace License](#)
[Jit Security](#)
[More Info](#)

[More Info](#)



Operationalizing DSOMM

Implementation - Infrastructure Hardening



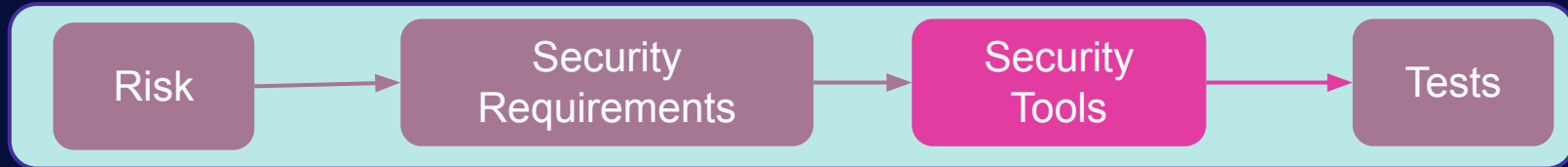
Operationalizing DSOMM

Implementation - Infrastructure Hardening



Scan Your Infrastructure:

- a. Containers / Kubernetes: Trivy / Kubescape



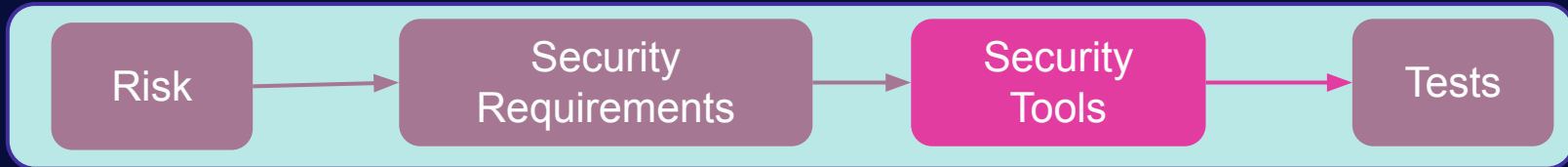
Operationalizing DSOMM

Implementation - Infrastructure Hardening



Scan Your Infrastructure:

- Containers / Kubernetes:** Trivy / Kubescape
- Cloud + Infrastructure as Code:** Prowler / Kics



Operationalizing DSOMM

Tests & Verification - Application Tests

Maturity Level 1 - N/A

Maturity Level 2 - Security unit tests
for important components



Operationalizing DSOMM

Tests & Verification - Application Tests



Maturity Level 1 - N/A

Maturity Level 2 - Security unit tests
for important components

Maturity Level 3 - Security
integration tests for important
components



Operationalizing DSOMM

Tests & Verification - Application Tests



Maturity Level 1 - N/A

Maturity Level 2 - Security unit tests for important components

Maturity Level 3 - Security integration tests for important components



Maturity Level 4 - High coverage of security related module and integration tests, smoke test



Operationalizing DSOMM

Tests & Verification - Consolidation

Definition of quality gates, Simple false positive treatment, Treatment of defects with severity high or higher



Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Definition of quality gates, Simple false positive treatment, Treatment of defects with severity high or higher

- Implement and enforce code, infrastructure, pipeline and 3rd party scans for each PR (Pull Request)

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Definition of quality gates, Simple false positive treatment, Treatment of defects with severity high or higher

- Implement and enforce code, infrastructure, pipeline and 3rd party scans for each PR (Pull Request)
- Implement Branch Protection to require approvals prior to PR merge

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Definition of quality gates, Simple false positive treatment, Treatment of defects with severity high or higher

- Implement and enforce code, infrastructure, pipeline and 3rd party scans for each PR (Pull Request)
- Implement Branch Protection to require approvals prior to PR merge
- False positive review process

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Definition of quality gates, Simple false positive treatment, Treatment of defects with severity high or higher

- Implement and enforce code, infrastructure, pipeline and 3rd party scans for each PR (Pull Request)
- Implement Branch Protection to require approvals prior to PR merge
- False positive review process
- Triage of all “highs”



Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Simple visualization of defects

Dashboard and reports of vulnerability backlog and vulnerabilities per PR



Maturity Level 2

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation

Integration of vulnerability issues into the development process, Treatment of defects with moderate severity, Usage of a vulnerability management system



Maturity Level 3

Maturity Level 2

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Integration of vulnerability issues into the development process, Treatment of defects with moderate severity, Usage of a vulnerability management system

- Triage of all “moderates” and “highs”

Maturity Level 3

Maturity Level 2

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Integration of vulnerability issues into the development process, Treatment of defects with moderate severity, Usage of a vulnerability management system

- Triage of all “moderates” and “highs”
- Tracking, managing and reporting on vulnerabilities

Maturity Level 3

Maturity Level 2

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation



Integration of vulnerability issues into the development process, Treatment of defects with moderate severity, Usage of a vulnerability management system

- Triage of all “moderates” and “highs”
- Tracking, managing and reporting on vulnerabilities
- Vulnerabilities as part of the development process



Maturity Level 3

Maturity Level 2

Maturity Level 1

Operationalizing DSOMM

Tests & Verification - Consolidation

Advanced visualization of defects,
Reproducible defect tickets, Treatment
of all defects



Operationalizing DSOMM

Tests & Verification - Consolidation



Advanced visualization of defects,
Reproducible defect tickets, Treatment
of all defects

- Detailed vulnerability metrics w/ root causes



Operationalizing DSOMM

Tests & Verification - Consolidation

Advanced visualization of defects,
Reproducible defect tickets, Treatment
of all defects

- Detailed vulnerability metrics w/ root causes
- Triage of all “lows”, “moderates” and “highs”



ACHIEVEMENT UNLOCKED



Maturity Level 4

Maturity Level 3

Maturity Level 2

Maturity Level 1

Security Maturity Models

Overview and Background

Leading Security Maturity Models

Did you see the value ?!



Security Maturity Models

Overview and Background

Leading Security Maturity Models



Translation to
Leadership

Tools &
Automation

Current State
Analysis

Resource
Needs

Gap
Prioritization

Risk
Exposure

Security Maturity Models

Overview and Background

Leading Security Maturity Models

Translation to
Leadership

Tools &
Automation

Current State
Analysis

Resource
Needs

Gap
Prioritization

Risk
Exposure

Security Maturity Models

Overview and Background

Leading Security Maturity Models



Translation to
Leadership



Tools &
Automation



Current State
Analysis



Resource
Needs



Gap
Prioritization



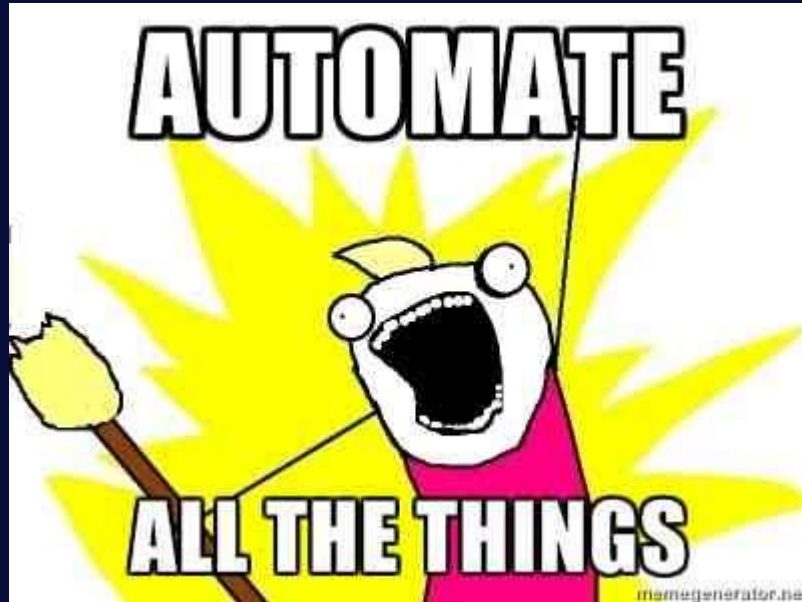
Risk
Exposure

Security Maturity Models

Overview and Background

Leading Security Maturity Models

What's Next?



Taking it to the next level: Jit

Automating security plans using OSS security tools orchestration



Dev-native experience using PR comments

jit jit-ci bot reviewed 1 minute ago [View changes](#)

jit-ci bot left a comment

✖ Jit has detected 3 important findings in this PR that you should review. The findings are detailed below as separate comments. It's highly recommended that you fix these security issues before merge.

```
terraform/main.tf
---
@@ -1,8 +1,10 @@
1 resource "aws_s3_bucket" "this" {
2   bucket = var.bucket_name
3   act    = "public"
4 +
5 +   AWS_ACCESS_KEY_ID = "AKIAIOSFODNN7EXAMPLE"
```

jit jit-ci bot 1 minute ago

Security control: lac Misconfig Detection

Type: Passwords And Secrets - Aws Access Key

Description: Query to find passwords and secrets in infrastructure code.

Severity: HIGH

[Learn more about this issue](#)

▶ Jit Bot commands and options (e.g., ignore issue)

Prioritize findings per PR to tackle the most pressing issues “Just in Time”!

jit My Plan Pipelines Pull Requests Backlog Integrations

Pull Requests

Listed below are the most important Pull Requests from the last two weeks

- 300 Monitored PRs
- 4 PRs with Open Security Findings
- 0 Merged PRs with Fixed Security Findings

Stale PRs with Open Security Findings		
Repository	PR Link	Opened
jitsecurity/test	PR Link	5d ago
jitsecurity/test	PR Link	6d ago
jitsecurity/test	PR Link	7d ago

Merged PRs with Open Security Findings		
Repository	PR Link	Merged
jitsecurity/asset-service	PR Link	1d ago
jitsecurity/pipeline-service	PR Link	5d ago
jitsecurity/test	PR Link	7d ago
jitsecurity/jit-remediation	PR Link	13d ago

Merged PRs with Ignored Security Findings		
Repository	PR Link	Merged
jitsecurity/asset-service	PR Link	1d ago
jitsecurity/pipeline-service	PR Link	5d ago
jitsecurity/test	PR Link	7d ago
jitsecurity/jit-remediation	PR Link	13d ago



Jit



Thank you

Intrigued? **Available now at jit.io**

Questions? **Contact me at raz@jit.io**





Scan This !



RAFFLE!

RAFFLE!

Win AirPods 3!!!

Jit