Assessing the Applicability and Limitations of Real-Time Vulnerability Detection in APIs

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Introduction

Modern systems rely heavily on Application Programming Interfaces (APIs), which have become a major target for cyberattacks. Traditional security testing methods often fail to detect vulnerabilities during live system operation.

Real-time vulnerability detection tools aim to identify security threats as they occur, but their effectiveness in real-world environments remains uncertain.

This research evaluates the applicability and limitations of real-time vulnerability detection in APIs.

Research Questions

Primary Research Question

To what extent are real-time vulnerability detection approaches effective in APIs?

Supporting Questions

- How accurately can real-time tools detect API vulnerabilities?
- What performance impact do these tools introduce?
- What limitations affect their deployment in practice?
- How reliable are these tools in securing APIs?

Literature Review

Research shows that real-time vulnerability detection is increasingly used to improve API security in modern systems.

Key findings from the literature:

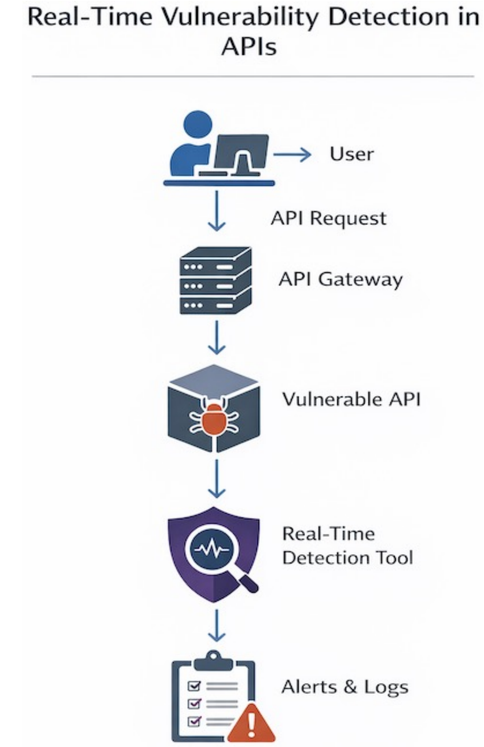
- Many detection systems rely on predefined rules or signatures
- Fuzzing and runtime monitoring can detect common API vulnerabilities
- High false positive rates and performance overhead remain key challenges
- Detection tools struggle to adapt to evolving attack techniques

Methodology

Qualitative multi-method approach using:

- Questionnaires with cybersecurity professionals
- Analysis of published research, industry reports, and real-world API case studies
- Optional experimental testing using a vulnerable API environment

System Architecture



Next Steps

- Conduct questionnaires with cybersecurity professionals
- Implement and test real-time detection tools in a controlled API environment
- Evaluate detection accuracy and performance impact
- Analyse findings to identify limitations and develop security recommendations

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Linux docker POSTMAN OWASP

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