Functional Specifications (Engineering-Level)

1. Architectural Overview

Modules:

1. Code Ingestion Layer

2. Static API Extractor

3. Parameter Inference Engine

4. Request Builder

5. Execution Engine

6. Vulnerability Analyzer

7. Reporting Module

2. Module Specifications

Code Ingestion Layer:

- Reads directory, detects language and framework.

Static API Extractor:

- Identifies routes, HTTP methods, params, auth.

Parameter Inference Engine:

- Rule-based v1, LLM v2.

Request Builder:

- Generates valid + fuzzed payloads.

Execution Engine:

- Sends requests, logs responses.

Vulnerability Analyzer:

- Detects SQLi, XSS, error traces.

Reporting Module:

- JSON/HTML/Markdown outputs

- Remediation guidance.

3. CLI

vulnscan --path ./src --framework fastapi --out report.html

4. Performance Requirements

- Complete scan in ≤2 mins for 200 files.

5. Security Requirements

- No external calls

- Secret redaction

6. Testing Plan

- Unit, integration, regression

7. Future Expansions

- Auto-PR fixes

- Continuous scanning