FOSSLight Scanner

LG전자 Open Source Task 김소임

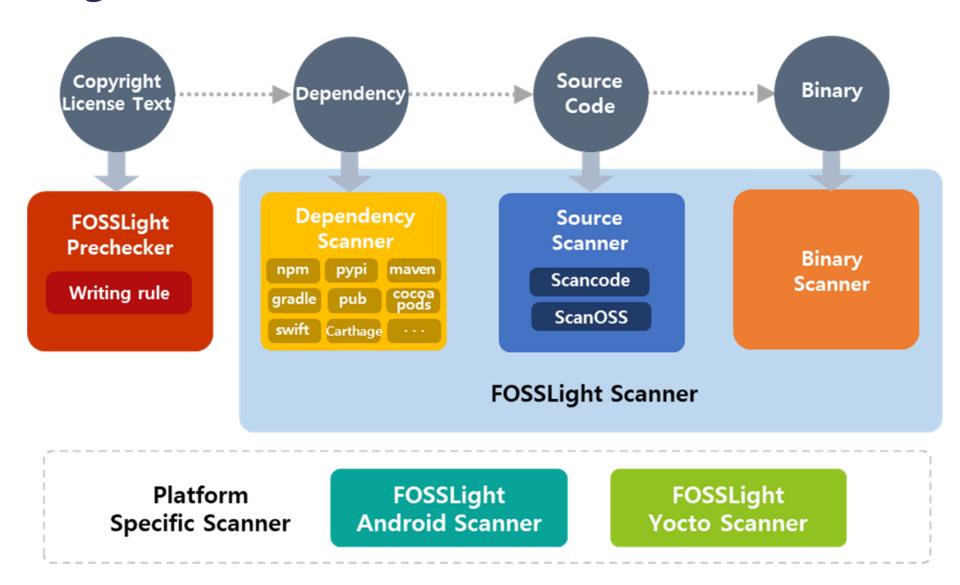


CONTENTS

- FOSSLight Scanner 소개
- 설치 방법
- 각 Scanner별 상세 설명
- What's New

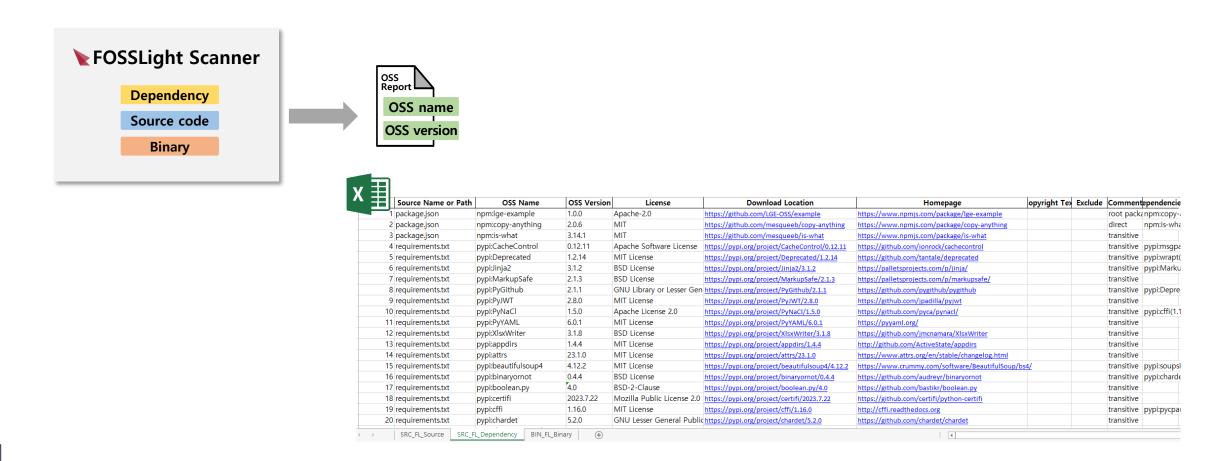
FOSSLight Scanner

FOSSLight Scanner



FOSSLight Scanner를 통한 SBOM 생성

FOSSLight Scanner 실행하여 오픈소스 분석 보고서 생성



FOSSLight Scanner 설치 방법

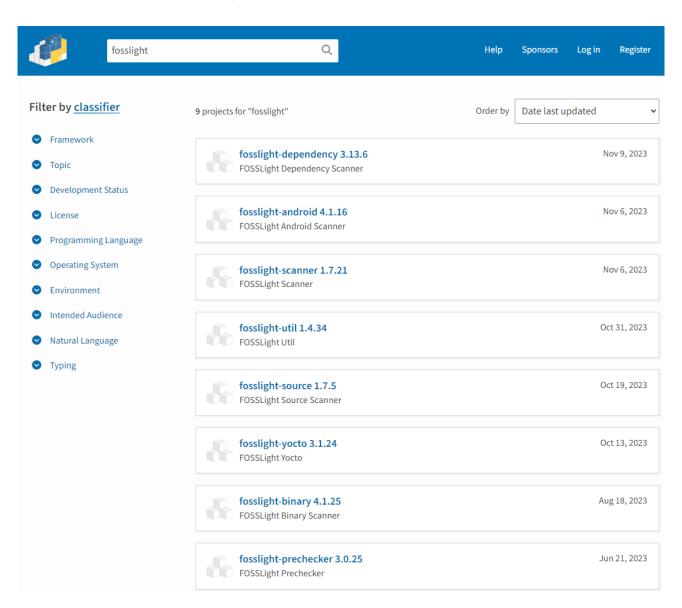
FOSSLight Scanner 설치

	Ubuntu	Windows	MacOS		
실행 파일 (.exe)	FOSSLight Binary Scanner	FOSSLight Binary Scanner, FOSSLight Dependency Scanner	FOSSLight Binary Scanner		
PyPI 패키지	전체 Scanner 지원				

■ 실행 파일

- FOSSLight Dependency Scanner (Windows만 가능)
 - https://github.com/fosslight/fosslight dependency scanner/releases
- FOSSLight Binary Scanner (Ubuntu, MacOS, Windows 가능)
 - https://github.com/fosslight/fosslight_binary_scanner/releases

FOSSLight Scanner PyPI 패키지



FOSSLight Scanner 패키지 설치 전 요구사항

1. Python 설치

• 지원 Python 버전: 3.8 ~ 3.11

• 권장 버전: 3.10

2. Virtualenv 환경 설치(권장)

- 시스템에 설치된 python에 영향을 주지 않고 새로운 python 가상 환경 세팅 가능
- 추가로 패키지를 설치해도 기존 시스템에 영향을 주지 않음

❖ FOSSLight Binary Scanner의 경우

• jar 파일에 대한 분석을 위해, Java 설치 권장 (Open Source JDK 설치)

https://learn.microsoft.com/ko-kr/java/openjdk/download (권장 버전 : 11)

❖ FOSSLight Dependency Scanner의 경우

• 각 package manager를 이용한 개발 환경과 동일한 빌드 환경 설정이 필요함 (ex. npm dependency 분석 수행을 위해 npm 빌드 도구 서버 내 설치 필요)

FOSSLight Scanner 패키지 설치 방법 (Ubuntu)

■ Python 3.10 필수 패키지 설치

```
$ sudo apt-get update
$ sudo apt-get install python3.10 python3.10-dev python3.10-distutils
python3-pip
```

■ Virtualenv 설치 및 활성화

```
$ pip install virtualenv
```

- \$ virtualenv -p /usr/bin/python3.10 venv
- \$ source venv/bin/activate

FOSSLight Scanner 패키지 설치 방법 (MacOS)

■ 사전 필수 패키지 설치

- % brew install openssl
- % brew install libmagic
- % brew install postgresql

FOSSLight Scanner 패키지 설치 방법 (Windows)

- Python 설치
 - https://www.python.org/downloads/windows/
 - 지원 Python 버전: 3.8 ~ 3.11
 - 권장 버전: 3.10
- Microsoft Visual C++ 14.0 이상 버전 다운로드
 - https://visualstudio.microsoft.com/visual-cpp-build-tools/ 에서 build tools > C++를 사용한 데스크톱 개발 체크 후 설치

FOSSLight Scanner 설치

■ Pip 설치 명령어를 통해 바로 설치 가능

\$ pip install fosslight_scanner

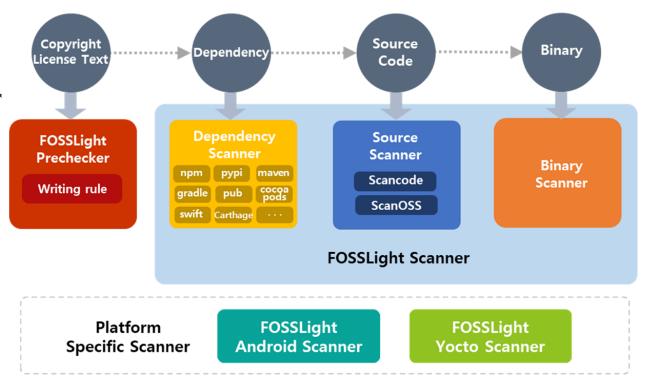
- 여러 FOSSLight Scanner 한 번에 설치 가능
 - FOSSLight Dependency Scanner
 - FOSSLight Source Scanner
 - FOSSLight Binary Scanner
 - FOSSLight Prechecker

- ❖ FOSSLight Android Scanner, FOSSLight Yocto Scanner의 경우
 - 별도로 설치해야 함 (\$ pip install fosslight_android / \$ pip install fosslight_yocto)

FOSSLight Scanner 사용 방법

FOSSLight Scanner

- FOSSLight Scanner를 하나로 합친 Scanner
 - FOSSLight Dependency Scanner
 - FOSSLight Source Scanner
 - FOSSLight Binary Scanner



• 특정 Path 또는 다운로드 받을 수 있는 링크에 대해 Open Source 분석을 수행하고, FOSSLight Report를 출력하는 도구

FOSSLight Scanner

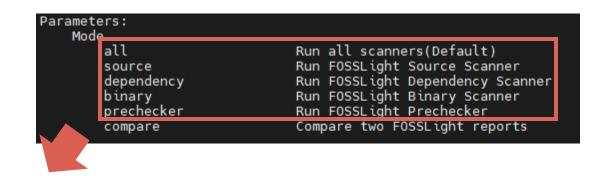
• 실행 방법

\$ fosslight [Mode] [option1] <arg1> [option2] <arg2>

```
Parameters:
    Mode
        all
                                 Run all scanners(Default)
                                 Run FOSSLight Source Scanner
        source
        dependency
                                 Run FOSSLight Dependency Scanner
                                 Run FOSSLight Binary Scanner
        binary
                                 Run FOSSLight Prechecker
        prechecker
                                 Compare two FOSSLight reports
        compare
    Options:
                                 Print help message
                                 Path to analyze (ex, -p {input_path})

* Compare mode input file: Two FOSSLight reports (supports excel, yaml)
        -p <path>
                                     (ex, -p {before_name}.xlsx {after_name}.xlsx)
                                 Link to be analyzed can be downloaded by wget or git clone
        -w <link>
        -f <format>
                                 FOSSLight Report file format (excel, yaml)
                                  * Compare mode result file: supports excel, json, yaml, html
                                 Output directory or file
        -o <output>
                                 Number of processes to analyze source
        -c <number>
                                 Keep raw data
                                 Hide the progress bar
                                 Print FOSSLight Scanner version
        - V
    Options for only 'all' or 'bin' mode
                                 DB Connection(format :'postgresql://username:password@host:port/database name')
        -u <db url>
    Options for only 'all' or 'dependency' mode
         -d <dependency argument>
                                          Additional arguments for running dependency analysis
```

FOSSLight Scanner - 실행 모드 선택



분석

오픈 소스 분석

물을 선택하여 실행 가능 **Compare**

BOM (FOSSLight Report) 비교 가능

FOSSLight Scanner - 분석 all 모드 (default)



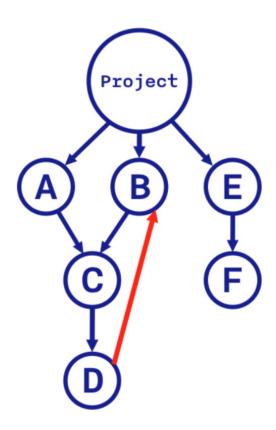
• 실행 방법

\$ fosslight all -p test_oss/

- 실행 결과
 - FOSSLight Report : Dependency, Source, Binary 분석 결과

+			1.71					-
	22	requireme	pypi:impo	5.12.0	Apache-2.	https://pyp	https://github.com/python/impor	transitive
	23	requireme	pypi:jsonm	1.9.0	MIT	https://pyp	i.org/project/jsonmerge/1.9.0	transitive
	24	requireme	pypi:jsons	4.17.3	MIT	https://pyp	i.org/project/jsonschema/4.17.3	transitive
	25	requireme	pypi:lastve	2.4.11	BSD-2-Cla	https://pyp	https://github.com/dvershinin/las	transitive
4	·	SRC_FL_De	ependency	SRC_FL_S	ource BI	IN_FL_Binary	scancode_reference scanoss	_reference

- Package Manager에 대한 Dependency 분석을 지원하는 도구
- Package Manager의 Manifest 파일 자동 감지하여 오픈 소스 정보 분석
- Direct / Transitive Dependency 오픈 소스 정보 분석



• 지원 Package Manager

Language/ Project	Package Manager	Manifest file	Direct dependencies	Transitive dependencies	Relationship of dependencies (Dependencies of each dependency)
Javascript	Npm	package.json	0	0	0
Java	Gradle	build.gradle	0	0	0
Java	Maven	pom.xml	0	0	0
Java (Android)	Gradle	build.gradle	0	0	0
ObjC, Swift Cocoapods		Podfile.lock	0	0	0
(iOS)	Carthage	Cartfile.resolved	0	0	X
Swift (iOS)	Swift	Package.resolved	0	0	0
Dart, Flutter	Pub	pubspec.yaml	0	0	0
Go	Go	go.mod	0	0	0
Python	Рурі	requirements.txt, setup.py, pyproject.toml	0	0	0
.NET	Nuget	packages.config, obj/project.assets.json	0	0	0
Kubernetes	Helm	Chart.yaml	0	X	X
Unity	Unity	Library/PackageManager/ProjectCache	0	0	X

• 실행 결과 예시

Package URL	OSS Name	OSS Version	License	Download Homepag Copyright Exclude Comment Depends On
pkg:npm/%40types/node@9.6.57	npm:@types/node	9.6.57	MIT	https://githhttps://www.npmjs.com/package/direct
pkg:npm/agent-base@6.0.2	npm:agent-base	6.0.2	MIT	https://githhttps://www.npmjs.com/package/transitive pkg:npm/debug@4.3.6
pkg:npm/asap@2.0.6	npm:asap	2.0.6	MIT	https://gith.https://www.npmjs.com/package/transitive
pkg:npm/axios@0.21.4	npm:axios	0.21.4	MIT	https://githhttps://www.npmjs.com/package/direct pkg:npm/follow-redirects@1.15.6
pkg:npm/buffer-equal-constant-time@1	. npm:buffer-equal-constant-time	1.0.1	BSD-3-Cla	a https://gith https://www.npmjs.com/package/transitive
pkg:npm/dayjs@1.11.12	npm:dayjs	1.11.12	MIT	https://gith.https://www.npmjs.com/package/direct
pkg:npm/debug@4.3.6	npm:debug	4.3.6	MIT	https://githhttps://www.npmjs.com/package/transitive pkg:npm/ms@2.1.2
pkg:npm/define-data-property@1.1.4	npm:define-data-property	1.1.4	MIT	https://githhttps://www.npmjs.com/package/transitive pkg:npm/es-define-property@1.0.0,pkg:npm/es-errors@1.3.0,pkg:npm/gopd@1.0.1
pkg:npm/ecdsa-sig-formatter@1.0.11	npm:ecdsa-sig-formatter	1.0.11	Apache-2	https://githhttps://www.npmjs.com/package/transitive pkg:npm/safe-buffer@5.2.1
pkg:npm/es-define-property@1.0.0	npm:es-define-property	1.0.0	MIT	https://gith.https://www.npmjs.com/package/transitive pkg:npm/get-intrinsic@1.2.4

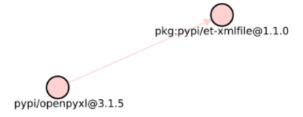
• SBOM 양식 지원 (SPDX)

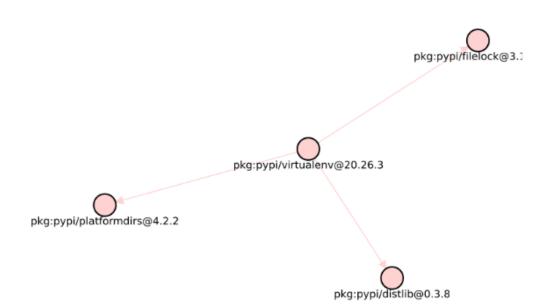
\$ fosslight_dependency -f spdx-yaml

```
SPDXID: SPDXRef-DOCUMENT
creationInfo:
 created: '2023-06-12T09:20:44Z'
  - 'Tool: FOSSLIGHT_DEPENDENCY 3.13.4'
  licenseListVersion: '3.20'
dataLicense: CC0-1.0
documentDescribes:
- Package:
    SPDXID: SPDXRef-1
    copyrightText: NONE
    downloadLocation: https://github.com/LGE-OSS/example
    homepage: https://www.npmjs.com/package/lge-example
    licenseConcluded: None
    licenseDeclared: Apache-2.0
    licenseInfoFromFiles: []
    name: npm:lge-example
    packageVerificationCode:
     packageVerificationCodeValue: null
    versionInfo: 1.0.0
- Package:
    SPDXID: SPDXRef-2
    copyrightText: NONE
    downloadLocation: https://github.com/mesqueeb/copy-anything
    homepage: https://www.npmjs.com/package/copy-anything
    licenseConcluded: None
    licenseDeclared: MIT
    licenseInfoFromFiles: []
    name: npm:copy-anything
    packageVerificationCode:
     packageVerificationCodeValue: null
    versionInfo: 2.0.6
Package:
    SPDXID: SPDXRef-3
    copyrightText: NONE
    downloadLocation: https://github.com/mesqueeb/is-what
    homepage: https://www.npmjs.com/package/is-what
    licenseConcluded: None
    licenseDeclared: MIT
    licenseInfoFromFiles: []
    name: npm:is-what
    packageVerificationCode:
      packageVerificationCodeValue: null
    versionInfo: 3.14.1
documentNamespace: http://spdx.org/spdxdocs/fosslight_dependency-953f9e51-a202-4777-9c59-ae4ddc3f5590
name: SPDX Document by FOSSLIGHT DEPENDENCY
relationships:
- relatedSpdxElement: SPDXRef-1
  relationshipType: DESCRIBES
  spdxElementId: SPDXRef-DOCUMENT
- relatedSpdxElement: SPDXRef-2
```

Dependecy Tree

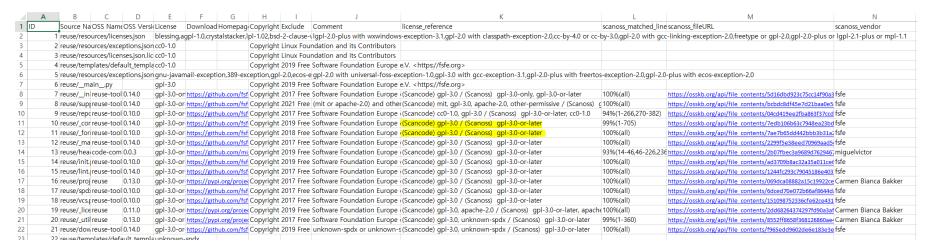
• --graph-path 옵션





FOSSLight Source Scanner

- 소스 코드를 분석하여 오픈소스 및 버전, 라이선스를 검출
- 여러 스캐너 지원을 통해 String Search뿐만 아니라 Snippet 매칭 지원



- FOSSLight Source Scanner가 채우지 못한 정보 및 오탐 정보 보완
 - Code Match 과정에서 OSS Name / OSS Version이 잘못된 정보로 기술될 수 있음
 - -> 사용자 판단에 따라 실제 사용된 OSS Name, Version으로 보완 필요

FOSSLight Binary Scanner

• 바이너리 목록 추출하여 Database에서 오픈소스 정보 확인

• Jar 파일에 대하여 보안 취약점 확인도 가능



4	Α	В	С	D	E	F	G	Н	1	J	К
1 II)	Source I	Na OSS Nam	OSS Versio	License	Download Location	Homepage	Copyright Text	Exclude	Comment	Vulnerability Link
2	2	22 lib/aho-	cc hankcs:ah	1.2.3	Apache License Version 2.0	hankcs/AhoCorasickDoubleArrayTrie				OWASP Result.	
3	2	23 lib/andr	oi vaadin.ex	t 0.0.201311	Apache License 2.0	http://developer.android.com/sdk				OWASP Result.	
4	2	24 lib/anno	ta jetbrains:	22.0.0	The Apache Software License \	JetBrains/java-annotations				OWASP Result.	
5	2	25 lib/ant-	I.1 apache.ar	1.10.12		https://ant.apache.org/				OWASP Result.	https://nvd.nist.gov/vuln/search/results?form_type=Ad
6	2	26 lib/chec	ke checkerfr	a 3.12.0	The MIT License	https://checkerframework.org				OWASP Result.	
7	2	27 lib/com	nccommons	- 1.9.4	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-beanutils/				OWASP Result.	https://nvd.nist.gov/vuln/search/results?form_type=Ad
8	2	28 lib/com	nccommons	- 1.5.0	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-cli/				OWASP Result.	
9	2	29 lib/com	nccommons	1.15	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-codec/				OWASP Result.	
10	3	30 lib/com	nccommons	3.2.2	http://www.apache.org/licenses/	http://commons.apache.org/collections/				OWASP Result.	https://nvd.nist.gov/vuln/search/results?form_type=Ad
11	3	31 lib/com	ncapache.co	1.21	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-compress/				OWASP Result.	https://nvd.nist.gov/vuln/search/results?form_type=Ad
12	3	32 lib/com	ncapache.co	2.9.0	https://www.apache.org/licenses	https://commons.apache.org/dbcp/				OWASP Result.	
13	3	33 lib/com	nccommons	2.1	http://www.apache.org/licenses/	http://commons.apache.org/digester/				OWASP Result.	
14	3	34 lib/com	nccommons	2.11.0	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-io/				OWASP Result.	https://nvd.nist.gov/vuln/search/results?form_type=Ad
15	3	35 lib/com	ncapache.co	2.2.1	https://www.apache.org/licenses	/LICENSE-2.0.txt				OWASP Result.	
16	3	36 lib/com	ncapache.co	3.12.0	https://www.apache.org/licenses	https://commons.apache.org/proper/commons-lang/				OWASP Result.	
17	3	37 lib/com	nccommons	1.2	http://www.apache.org/licenses/	http://commons.apache.org/proper/commons-logging/			Exclude	OWASP Result. Excl	ıded due to Binary DB.
18	3	38 lib/com	nccommons	1.2	Apache-2.0					Binary DB Result	

• Comment: OSS 정보 추출 방법

FOSSLight Scanner - Compare 모드

- 두개의 BOM(FOSSLight Report)를 비교
 - \$ fosslight compare -p fosslight_report1.xlsx fosslight_report2.xlsx
 - 비교 가능 input 지원 포맷 : xlsx, yaml
- Compare 모드 실행 결과 (지원 포맷 : xlsx, json, yaml, html)

FOSSLight Scanner Compare Result

BOM Compare Result

- Before FOSSLight Report file: /home/soim/git/scanner/fosslight_scanner/tests/fosslight_raw_data/fosslight_report_230308_prj-5204.vaml
- After FOSSLight Report file: /home/soim/git/scanner/fosslight_scanner/tests/fosslight_raw_data/fosslight_report_230308_prj-5203.yaml

Status	OSS_Before	License_Before	OSS_After	License_After
add			FFT	FFT License
delete	JsonCPP(1.8.4)	MIT		
change	gson(2.8.2)	Apache-2.0	gson(3.1)	Apache-2.0

네트워크 연결 없이 동작 가능 여부

FOSSLight Dependency Scanner

Package manager	필요 사항
Gradle	com.github.hierynomus.license '0.16.1' 플러그인 미리 설치 필요 (프로젝트 패키지 미리 설치 필요)
Maven	org.codehaus.mojo:license-maven-plugin 플러그인 미리 설치 필요 (프로젝트 패키지 미리 설치 필요)
NPM	license-checker 플러그인 미리 설치 필요 (프로젝트 패키지 미리 설치 필요 (node_modules 디렉토리 생성된 상태))
Android	android-dependency-scanning 플러그인 미리 설치 필요 (프로젝트 패키지 미리 설치 필요)
Pub	flutter oss licenses 플러그인 미리 설치 필요 (프로젝트 패키지 미리 설치 필요)
Cocoapods	'pod spec whichregex {package name}' 명령어 동작 가능한 상태 (프로젝트 패키지 미리 설치 필요)
Carthage	프로젝트 패키지 미리 설치 필요 ('Carthage/Checkouts' 디렉토리 생성된 상태).
PYPI, Go, Swift	불가

FOSSLight Source Scanner

• Snippet 매칭은 네트워크 연결된 환경에서만 동작함

FOSSLight Binary Scanner

• 보안취약점 정보는 네트워크 연결된 환경에서만 얻을 수 있음

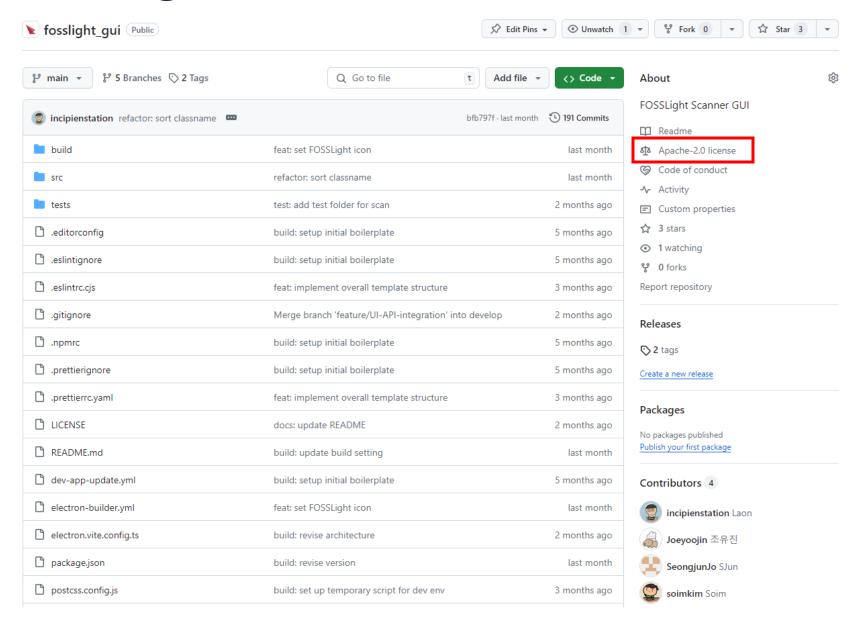
What's New

• FOSSLight Scanner 변신!!!!!!!

커맨드 라인으로 호출하려니 parameter 확인해야 하네..

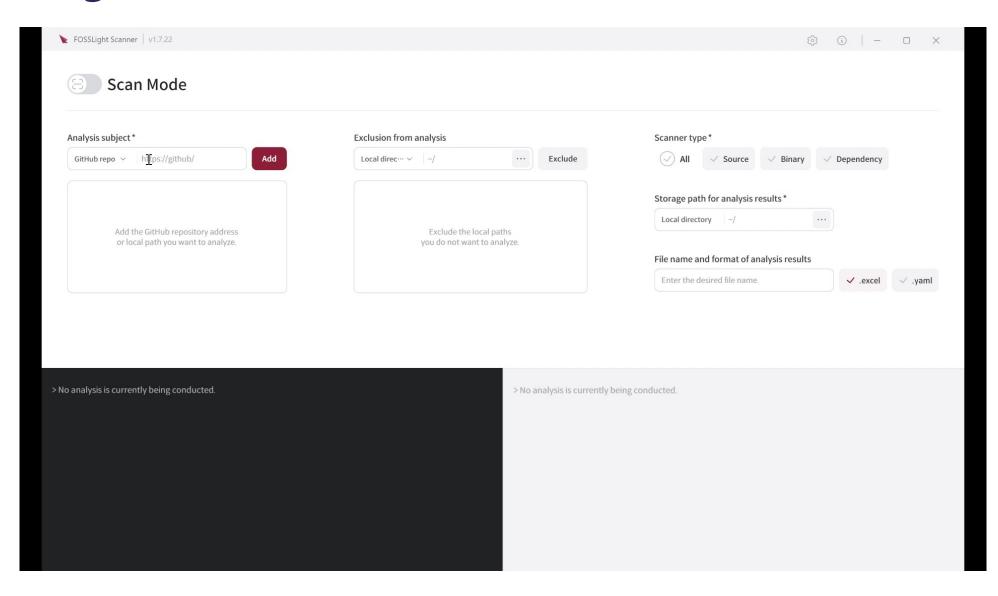


FOSSLight Scanner GUI

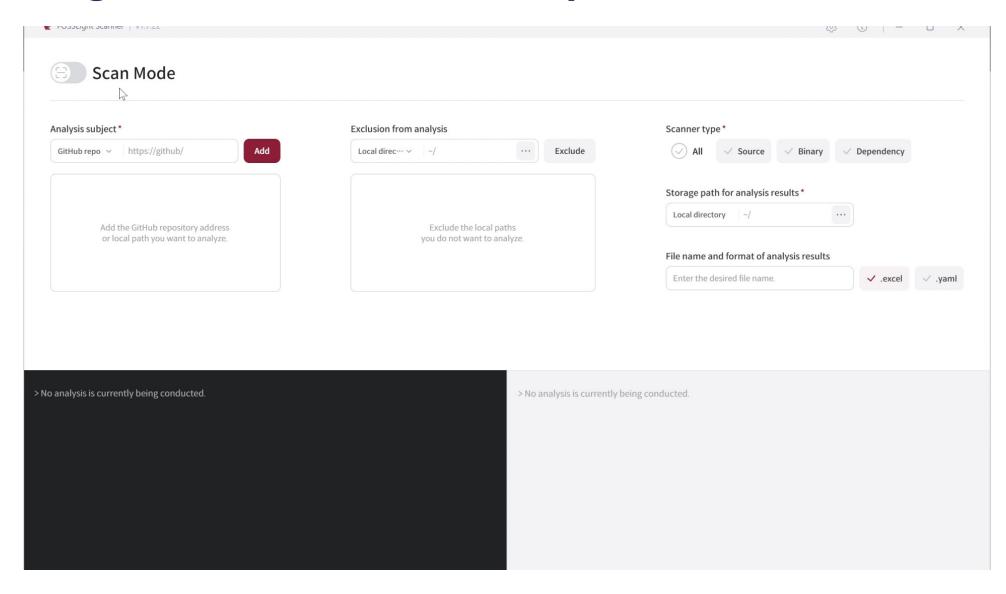




FOSSLight Scanner GUI – Scan Mode

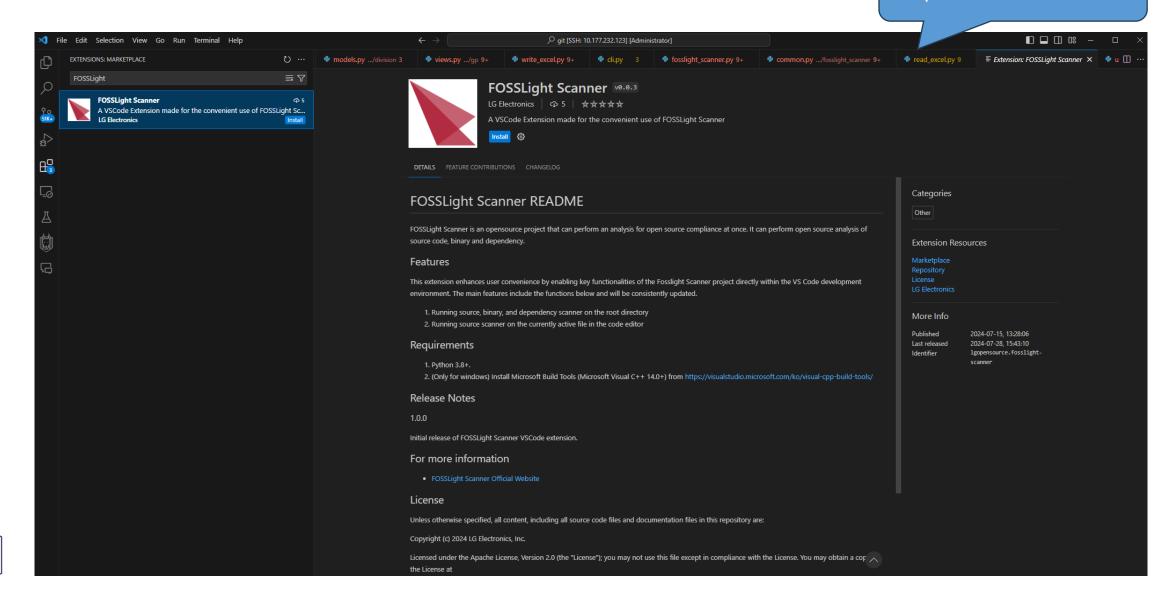


FOSSLight Scanner GUI – Compare Mode



VS Code Extension

Experimental version



Γ

Q&A