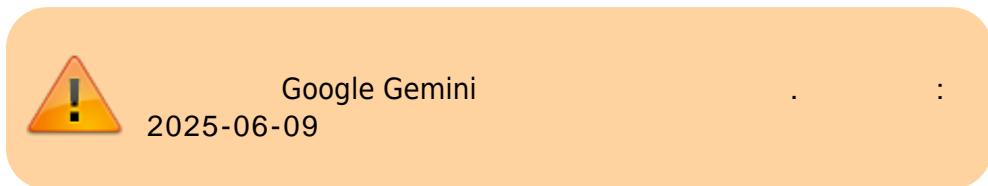


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OpenSCAP



1. (SCAP) OpenSCAP

1.1. SCAP 가?

SCAP(Security Content Automation Protocol)

가 가	(NIST) ¹	800-53(SP 800-53) (FISMA) ¹	SCAP ¹
NIST가	(NVD)	SCAP ¹	

NIST가 (NVD) .¹ SCAP

¹ SCAR

CAP NIST , 가 , NIST FISMA

, FISMA
1¹ NIST
1¹
SCAP
SCAP
가 , SCAP “ ”

1.2. OpenSCAP

OpenSCAP(ОСCAP) SCAP .3 SCAP
, SCAP 가 (oscap)
^ OpenSCAP SCAP 가 (SSG) 가
.^ OpenSCAP SCAP

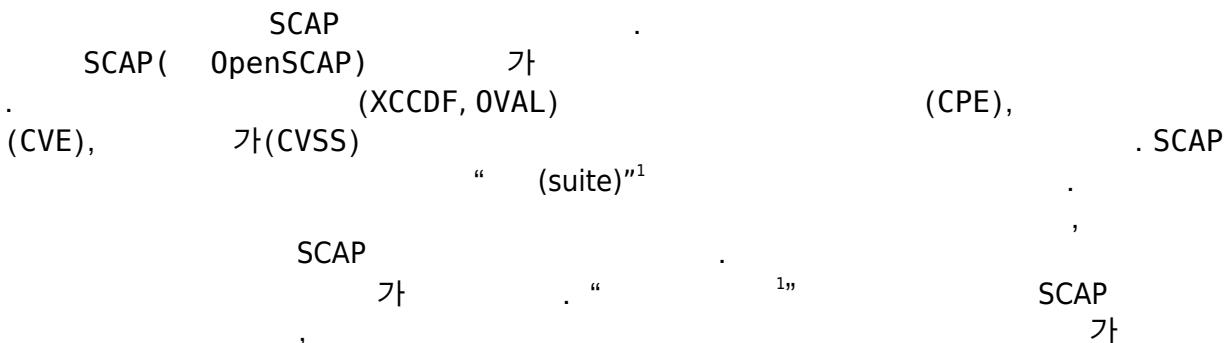
2. SCAP

SCAP , SCAP

2.1. SCAP

- XCCDF (Extensible Configuration Checklist Description Format):
SCAP
1 :
• OVAL (Open Vulnerability and Assessment Language):
3
가
1 . SCAP 가 (SSG) XCCDF
• CVE (Common Vulnerabilities and Exposures):
1
• CPE (Common Platform Enumeration):
1
• CVSS (Common Vulnerability Scoring System):
1
remediation

- CCE (Common Configuration Enumeration):
 - ARF (Asset Reporting Format):
 - . oscap ARF
 - TMSAD (Trust Model for Security Automation Data):
 - AID (Asset Identification):
 - CCSS (Common Configuration Scoring System):



2.2. SCAP

SCAP

SCAP

SCAP

	(Full Name)		SCAP
XCCDF	Extensible Configuration Checklist Description Format ()	, “ ” XML	가
OVAL	Open Vulnerability and Assessment Language (가)	(: ,) 가 XML () .	XCCDF “ ” .
CVE	Common Vulnerabilities and Exposures ()		가 .
CPE	Common Platform Enumeration ()	IT (, OS,) .	가 .
CVSS	Common Vulnerability Scoring System (가)	가 .	remediation .
CCE	Common Configuration Enumeration ()	() .	. .
ARF	Asset Reporting Format ()	가 .	가 .

SCAP
SCAP
SCAP
OpenSCAP

3. OpenSCAP

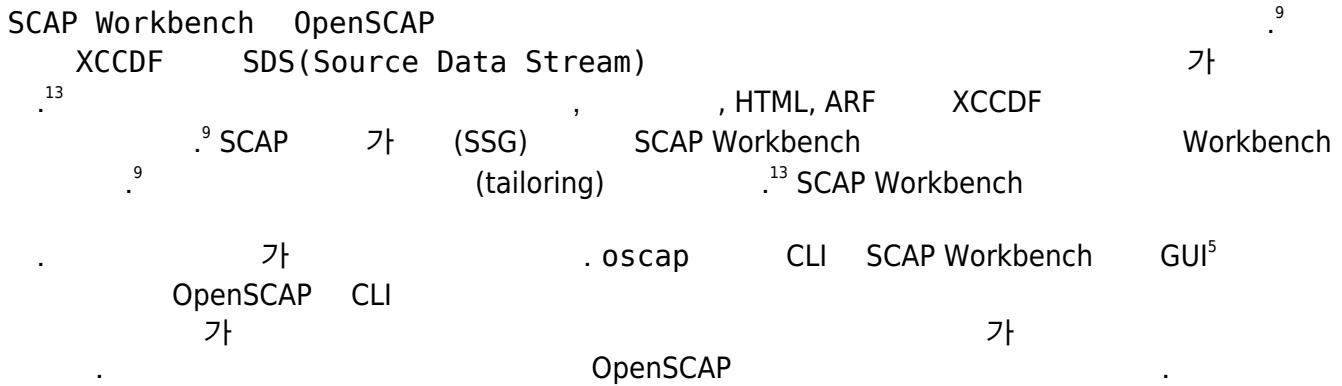
OpenSCAP SCAP
oscap . OpenSCAP 가
(oscap) (SCAP Workbench)

3.1. OpenSCAP

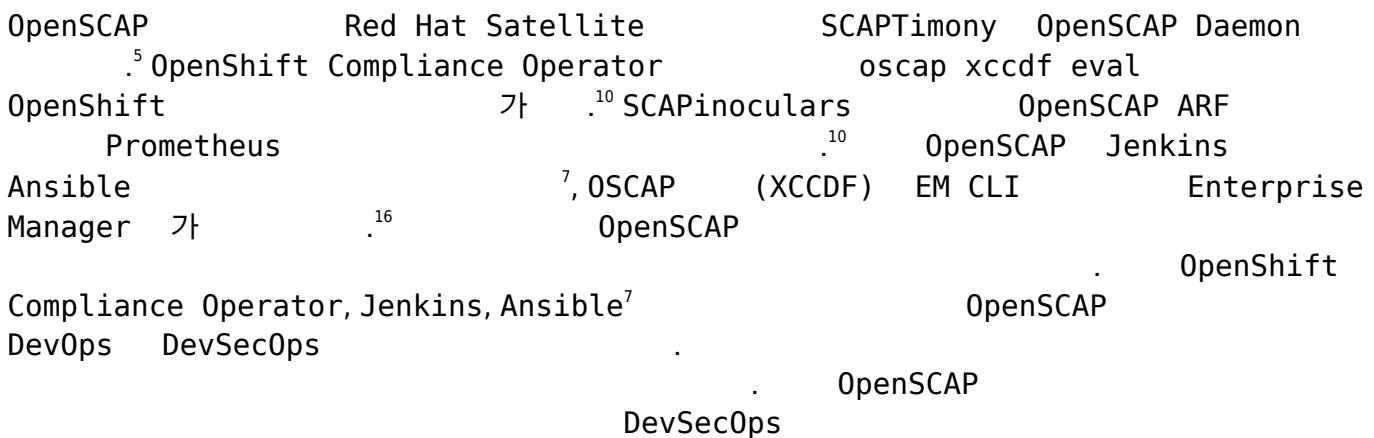
3.2. oscap:

```
oscap OpenSCAP
      .5 , XCCDF          OVAL
      .5 SCAP 1.2     SCAP 1.1   1.0
DISA STIG, NIST    USGCB, PCI-DSS   Red Hat
oscap xccdf eval  가           9, oscap info
      .9 oscap xccdf generate report ARF/XML
      .9 oscap          (verbose)           HTML
      .9 (CLI)          OpenSCAP
      . GUI           , CLI           , CI/CD
      . oscap5
      ( : cron      , Ansible, CI/CD) , OpenSCAP
```

3.3. SCAP Workbench:



3.4.



4. 가 : OpenSCAP 가

OpenSCAP
OpenSCAP 가

4.1.

OpenSCAP . SCAP 가 (SSG)

- Fedora: `dnf install openscap-scanner5` `oscap` . SCAP Workbench `yum install scap-workbench9` ,
 `openscap-scanner` 가 .
 가 ¹²
 - RHEL 6/7, CentOS 6/7: `yum install openscap-scanner5` `yum install scap-workbench9`
 - RHEL 8+/CentOS 8+: Fedora `dnf` ,
 ¹²
 - Debian/Ubuntu: `oscap` `libopenscap8` `apt-get install`

```
libopenscap85 . Ubuntu SCAP Workbench SSG
    sudo apt-get install -y openscap-scanner scap-security-guide
oscap-anaconda-addon17
12
```

SCAP 가 (SSG) :

- Fedora: dnf install scap-security-guide.¹⁴
- RHEL/CentOS: yum install scap-security-guide.⁹
- Debian 10+/Ubuntu 18.04+: apt install ssg-base ssg-debderived ssg-debian ssg-nondebian ssg-applications.¹⁴

OpenSCAP

	oscap	SSG	SCAP Workbench ()	
Fedora	sudo dnf install openscap-scanner scap-security-guide		sudo dnf install scap-workbench	Workbench openscap-scanner
RHEL/CentOS 7	sudo yum install openscap-scanner scap-security-guide		sudo yum install scap-workbench	가 .
RHEL/CentOS 8	sudo dnf install openscap-scanner scap-security-guide		sudo dnf install scap-workbench	
Ubuntu 18.04+	sudo apt update && sudo apt install openscap-scanner scap-security-guide		sudo apt install scap-workbench	Ubuntu scap-security-guide ssg- scap-security-guide ¹⁴ (¹⁷)
Debian 10+	sudo apt update && sudo apt install libopenscap8 scap-security-guide (¹⁴ ssg-)		sudo apt install scap-workbench	libopenscap8 oscap SSG ssg-* ¹⁴ 가 ⁵

가 OpenSCAP

(: SSG)

, 가 , 가

가 OpenSCAP

가 .

4.2. SCAP 가 (SSG)

SCAP 가 (SSG) SCAP , remediation , ¹⁴ OSCAP SSG .⁴ SSG SCAP Workbench (: yum install scap-security-guide).⁹ Fedora, RHEL, CentOS, Scientific Linux SSG .⁹ SSG /usr/share/xml/scap/ssg/content/ .⁹ XCCDF, OVAL

4.3.

4.3.1.

```
가 , SSG .9  
가  
<datastream_file.xml> oscap info <datastream_file.xml>  
( : oscap info /usr/share/xml/scap/ssg/content/ssg-rhel6-ds.xml).9 SCAP  
Workbench .9 ( : RHEL 8 )  
( : CIS Benchmark Level 1)
```

4.3.2. 가 oscap

```
oscap      가          : oscap xccdf eval --profile <profile_id>  
--results <results_file.xml> --report <report_file.html>  
<datastream_file.xml>9      DISA STIG      oscap xccdf eval --profile  
selected_profile --results result_file --cpe cpe_dictionary disa_stig_content  
      .5  가          9, oscap OVAL  
가      : oscap oval eval....19      OpenSCAP ,
```

4.3.3. **(HTML, ARF, XCCDF)**

9, --results-arf arf.xml
9, --report report.html HTML
9 XCCDF 9 HTML
9, SCAPinoculars ARF HTML
10 가 , 가 (ARF,
XCCDF) 가 (HTML)
OpenSCAP .

4.4. **(Tailoring)**

SCAP Workbench ID	/	¹³ , “	¹⁵	(fork)	SCAP
가	”	”	”	15	

STIG oscap xccdf eval --profile <STIG_profile>...
5, STIG OpenSCAP/SSG /usr/share/xml/scap/ssg/content
.20 STIG remediation Ansible DISA 가
(Supplemental Automation Content) .20

5.3. (: FISMA, HIPAA, PCI-DSS, NIST SP 800-53)

OpenSCAP	CIS	STIG	. SCAP
NIST SP 800-53		¹ , FISMA	¹ .
PCI-DSS	가	(⁵ , SSG가) PCI DSS	¹⁴), Oracle
Linux SSG	HIPAA	“ ”	¹⁶ . SCAP
NIST		¹	

OpenSCAP FISMA, HIPAA, PCI-DSS, NIST SP 800-53
SCAP 가 가 (OVAL)
SSG가 .
OpenSCAP 가 SSG 가

6. OpenSCAP

OpenSCAP

- 6.1. : OpenSCAP
가 가 .¹
 - 6.2. : SCAP
, SCAP
“ ”⁶, SCAP
가 가
 - 6.3. (): OpenSCAP
⁶, OpenSCAP(SCC + OVAL)²¹⁴ SCAP
Nessus
OpenSCAP²²
 - 6.4. :
가 .⁷
OpenSCAP⁸⁷, remediation
가
 - 6.5. :
OpenSCAP⁷ CLI oscap

가

18

SCAP

가

가

SSG

SSG

8. OpenSCAP

OpenSCAP 가

Nessus

Qualys

VMDR OpenSCAP

8.1. OpenSCAP Nessus

OpenSCAP Nessus

가

가

- / : Nessus remediation (Nessus Attack Scripting Language) ²¹ OpenSCAP SCAP
SCAP DoD Nessus SCAP (: RHEL 8 SCAP) ²¹ Tenable(Nessus) Nessus SCAP
- : Nessus 72% OpenSCAP 96% ²⁵, 가 SCAP
- Remediation: OpenSCAP remediation (: CIS Ansible)
- Nessus remediation ²¹
- UI: OpenSCAP Nessus GUI OpenSCAP(SCC + OVAL) ²¹
- : SCAP(OpenSCAP) DoD ²¹ Nessus ²⁶

8.2. OpenSCAP Qualys VMDR

OpenSCAP Qualys VMDR

가

, , ,

- / : OpenSCAP SCAP ²² Qualys
VMDR IT, OT, IoT (VMDR) ²² Qualys
- : (, OS) ²² Qualys
- : OpenSCAP SCAP /

- ²² Qualys IT, OT, IoT
가 . Qualys VMDR 가
• : OpenSCAP . Qualys VMDR (가
).²²
• : OpenSCAP (가) () . Qualys
, OpenSCAP . (²⁷ Qualys).

8.3. : OpenSCAP, Nessus, Qualys VMDR

OpenSCAP, Nessus, Qualys VMDR

	OpenSCAP	Nessus (Tenable)	Qualys VMDR
	SCAP 가 (OVAL) ,	,	(VMDR), ,
	SCAP (XCCDF, OVAL, CPE, CVE)	, NASL , Tenable	, ,
	()	(Nessus Pro, Tenable.io)	()
SCAP		; SCAP 가	/ 가 , SCAP 가
	, (SSG STIG, CIS) (oscap)	GUI,	, , , (IT/OT/IoT)
	HTML, ARF, XCCDF; / ,	, 가	, , ,
Remediation	remediation 가 (: SSG Ansible)	remediation	, ,
	/ ,	가, ,	, , ,
	CLI (oscap), GUI (SCAP Workbench)	GUI (Nessus Pro, Tenable.io)	
	SCAP 가 , , ,	가, ,	가 VMDR , MSSP,

OpenSCAP 가	SCAP	STIG CIS
. Nessus Qualys	.	
, SCAP	OpenSCAP 가	가

, OpenSCAP SCAP 가 . , Nessus Qualys SCAP
가 . OpenSCAP . SCAP
가 . “ ” SCAP

9.

OpenSCAP , . OpenSCAP

9.1. **OpenSCAP:** , , API

```
OpenSCAP , OpenSCAP cmake make ,  
Fedora, RHEL, Ubuntu/Debian  
12  
12  
OSCAP_SCHEMA_PATH ) (oscap -v), (LD_LIBRARY_PATH,  
OpenSCAP .12 OpenSCAP Base C API  
lcov, genhtml 가 .12  
11,
```

9.2. OpenSCAP

OpenSCAP GitHub 18 GitHub 18
12 .
¹², API 11 , 18
OpenSCAP .
가 .
가 .
OpenSCAP ,

10.

OpenSCAP
OpenSCAP

10.1. OpenSCAP 가

OpenSCAP 가 , , SCAP ,

- : 가
- : CVE, CPE, XCCDF, OVAL
- :
- : 가 ,

OpenSCAP ,

10.2. OpenSCAP

DevSecOps, ,

OpenSCAP

OpenShift Compliance Operator¹⁰

OpenSCAP IT

OpenSCAP , , SCAP

“ (Shift Left)” “ 가

(Security as Code)”

, OpenSCAP (XCCDF)

OpenSCAP¹¹ OpenSCAP

가

OpenSCAP SCAP 가 (SSG) 가 가

, , IoT

OpenSCAP

¹⁴

() , , OpenSCAP
SCAP

, OpenSCAP

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