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OpenSCAP

Google Gemini

.

: 2025-06-09

1. (SCAP) OpenSCAP

(IT) 가 , , 가, (SCAP) OpenSCAP .

1.1. SCAP 가?

SCAP(Security Content Automation Protocol) ,
가 가 .¹ SCAP
(NIST) 800-53(SP 800-53)
¹ (FISMA)
¹ SCAP
NIST가 (NVD) .¹ SCAP ,
 ,
 ,
¹ SCAP
가 ,
¹ .
SCAP NIST , 가 , NIST FISMA
¹ NIST SCAP
 , FISMA
 .
SCAP
가 , SCAP “ ”
“ ”¹
 ,
 .

1.2. OpenSCAP :

OpenSCAP(OSCAP) SCAP .³ SCAP
 , SCAP
¹ OpenSCAP SCAP 가 (SSG) (oscap)
³ OpenSCAP SCAP
 ,
SCAP . OpenSCAP
가
 .
가

1.3.

가 SCAP
, SCAP
가
DSS, NIST, FedRAMP, FISMA
IT
가
가
OpenSCAP
가

2. SCAP

SCAP
SCAP

2.1. SCAP

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

SCAP
SCAP(OpenSCAP) 가
(XCCDF, OVAL) (CPE),
(CVE), 가(CVSS) “ (suite)”¹ SCAP
SCAP 가 “ 1” SCAP 가

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,)	
CVSS	Common Vulnerability Scoring System (가)	가	remediation
CCE	Common Configuration Enumeration ()	()	
ARF	Asset Reporting Format ()	가	가 가

SCAP

SCAP
가
SCAP
OpenSCAP

3. OpenSCAP :

OpenSCAP SCAP
OpenSCAP 가 ,
(oscap) (SCAP Workbench)

3.1. OpenSCAP :

OpenSCAP⁵
SCAP Workbench, Red Hat Satellite SCAPTimony, OpenSCAP⁵
Daemon OpenSCAP Base C API⁵
SCAP¹¹ 가
, API , OpenSCAP SCAP C API¹¹ OpenSCAP
가 , 가
API 가
SCAP SCAP

3.2. oscap:

oscap OpenSCAP⁵
XCCDF OVAL 가⁵
SCAP 1.2 SCAP 1.1 1.0⁵
DISA STIG, NIST USGCB, PCI-DSS Red Hat 가⁵
oscap xccdf eval 가⁹, oscap info⁹
oscap xccdf generate report ARF/XML HTML¹²
oscap (verbose)
(CLI) OpenSCAP⁹
GUI , CLI , CI/CD⁵
(: cron , Ansible, CI/CD) , OpenSCAP

3.3. SCAP Workbench:

SCAP Workbench OpenSCAP⁹

XCCDF SDS(Source Data Stream) 가

¹³ , HTML, ARF XCCDF

⁹ SCAP 가 (SSG) SCAP Workbench Workbench

⁹ (tailoring) ¹³ SCAP Workbench

가 . oscap CLI SCAP Workbench GUI⁵

OpenSCAP CLI

가

OpenSCAP

3.4.

OpenSCAP Red Hat Satellite SCAPTimony OpenSCAP Daemon

⁵ OpenShift Compliance Operator oscap xccdf eval

OpenShift 가 ¹⁰ SCAPinoculars OpenSCAP ARF

Prometheus ¹⁰ OpenSCAP Jenkins

Ansible ⁷ OSCAP (XCCDF) EM CLI Enterprise

Manager 가 ¹⁶ OpenSCAP

Compliance Operator, Jenkins, Ansible⁷ OpenSCAP OpenShift

DevOps DevSecOps

OpenSCAP

DevSecOps

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 . ¹² 가
- 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

가 DISA FSO, NSA, Red Hat

14

가

SSG

가

가

4.3.

4.3.1.

가

, SSG

⁹

⁹ 가

```
<datastream_file.xml> oscap info <datastream_file.xml>
( : oscap info /usr/share/xml/scap/ssg/content/ssg-rhel6-ds.xml).9 SCAP
Workbench9 ( : 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 가9, oscap OVAL
가 : oscap oval eval....19 OpenSCAP ,
```

4.3.3. (HTML, ARF, XCCDF)

```
. --results-arf arf.xml
(ARF)9, --report report.html HTML
.9 XCCDF9 HTML
9, SCAPinoculars ARF HTML
.10 가 (ARF,
XCCDF) 가 (HTML)
OpenSCAP .
```

4.4. (Tailoring)

(Tailoring)

SCAP Workbench¹³, (fork)

ID /¹⁵

“ ” “ ”¹⁵

가¹⁵ OpenSCAP XCCDF 1.1 , SCAP

openscap13

(: SSG)
14 ,
(¹⁵)
15 ,
15
가 ,

5. OpenSCAP

OpenSCAP
가 CIS(Center for Internet Security) DISA STIG(Security
Technical Implementation Guides)
가

5.1. CIS(Center for Internet Security)

CIS
. OpenSCAP CIS PCI DSS, NIST, FedRAMP,
FISMA⁶ Red Hat RHEL(Red Hat Enterprise
Linux) CIS scap-security-guide
18
oscap SSG
18 가, oscap
remediation()
1 CIS
1 Level 2)
Ansible
18 OpenSCAP Ubuntu CIS
17, CIS (Level
--remediate
17
OpenSCAP remediation 18, remediation
. , SSG RHEL 8 CIS remediation CIS 100%
98%
remediation 가
remediation 가 , 100%

5.2. DISA STIGs(Security Technical Implementation Guides)

DISA STIG (DoD)
²⁰ OpenSCAP DISA STIG 가
⁵ SCAP 가 (SSG) STIG RHEL 6 DISA STIG SSG
¹⁴ SSG DoD STIG Red Hat¹⁴
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
SSG, Red Hat, DISA FS0 NSA STIG 14
가 DoD , DoD STIG
가 가 (SSG) STIG

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			¹ .
	SCAP	가	가	(OVAL)
			SSG가	.
	OpenSCAP	가	SSG	가

6. OpenSCAP

OpenSCAP

- 6.1. : OpenSCAP
가 가 .¹ ,⁷ 가 .
- 6.2. : SCAP
, SCAP “ ”⁶, SCAP
. ⁶ 가 가
- 6.3. (): OpenSCAP
⁶, OpenSCAP(SCC + OVAL) Nessus
²¹ OpenSCAP .²²
- 6.4. :
⁷ 가 ⁷, remediation
⁸ OpenSCAP 가
- 6.5. :
OpenSCAP .⁷ CLI oscap
- 6.6. : Jenkins, Ansible
.⁷

OpenSCAP
(6.1) (, 6.3) 가
(6.4). (6.2) (6.6)
.
,
,
가 .
, 가 .

7.

OpenSCAP 가 , 가 . OpenSCAP

OpenSCAP 가 (: 2GB)
 “Out of memory: Killed process (oscap)” “Memory allocation failed”
 가 , / , /
 24

OSCAP_PROBE_MEMORY_USAGE_RATIO ,
OSCAP_PROBE_IGNORE_PATHS (:/home) ,
remediation , , oscap .²⁴
가 / 가

SCAP

가 (XCCDF, OVAL) , .⁸ SCAP 가
(²⁴ “ 가 ”)
, SCAP , openSCAP

(Coverage Gaps)

SSG RHEL 8 CIS remediation 98% ,
CIS 100% 가
“ ” 18

SSG 100% 가

OpenSCAP

가

가

18

8 SCAP 가

SSG

SSG

8. OpenSCAP :

OpenSCAP 가

Nessus

Qualys

VMDR OpenSCAP

8.1. OpenSCAP Nessus

OpenSCAP Nessus 가 , , 가

- / : Nessus (Nessus Attack Scripting Language)
remediation²¹ OpenSCAP SCAP
SCAP DoD , Nessus SCAP
(: RHEL 8 SCAP).²¹ Tenable(Nessus) Nessus SCAP
- : OpenSCAP 96%
Nessus 72%²⁵ 가
- Remediation: OpenSCAP remediation (: CIS Ansible)¹⁸
Nessus remediation²¹
- UI: OpenSCAP , Nessus GUI²¹
Nessus OpenSCAP(SCC + OVAL)²¹
- : SCAP(OpenSCAP) DoD²¹ Nessus²⁶

8.2. OpenSCAP Qualys VMDR

OpenSCAP Qualys VMDR 가 , ,

- / : OpenSCAP SCAP²² Qualys
VMDR IT, OT, IoT
(VMDR)²² Qualys , ,
- 가²²
: (, , OS)²² , Qualys
- : OpenSCAP SCAP /
²² Qualys IT, OT, IoT 가

- 가 : OpenSCAP . Qualys VMDR (가)²²
- : OpenSCAP (가) . Qualys (²⁷ , OpenSCAP , 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		가 ; SCAP	/ 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, ,	VMDR 가 , MSSP, ,

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

[illegible]

9.

OpenSCAP, OpenSCAP.

9.1. OpenSCAP: , , API

```

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

```

9.2. OpenSCAP

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

10.

OpenSCAP

10.1. OpenSCAP 가

OpenSCAP 가 , SCAP 가 ,
 : :
 : CVE, CPE, XCCDF, OVAL

가 OpenSCAP

10.2. OpenSCAP

DevSecOps, OpenSCAP
OpenShift Compliance Operator 10
OpenSCAP IT OpenSCAP
SCAP , SCAP
“ (Shift Left)” “ (Security as Code)”
OpenSCAP (XCCDF)
OpenSCAP .1 OpenSCAP
SCAP 가 (SSG) 가 가 OpenSCAP , IoT
OpenSCAP 14 ()
OpenSCAP
SCAP
OpenSCAP

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