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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
.

1.3.

가 SCAP (plumbing) PCI DSS, NIST, FedRAMP, FISMA IT 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): OVAL (: 가 ,)
 - 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
(oscap) OpenSCAP 가 ,
(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) OpenSCAP
. 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
- 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

⁹⁹ 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

가 SCAP

¹⁵ OpenSCAP XCCDF 1.1 ,

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

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 Hat .14 STIG
oscaped 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 FSO NSA STIG 14
가 DoD , DoD
STIG

STIG가가 (SSG)

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 가 .7
: SCAP .1 6.2. , SCAP
“ ” 6, SCAP
.6 가 가
6.3. (): OpenSCAP .4 SCAP
6, OpenSCAP(SCC + OVAL) Nessus
.21
OpenSCAP .22
7, remediation .6.4. :
가 .7 가
.8 OpenSCAP
.6.5. :
. OpenSCAP
.6.6. : Jenkins, Ansible
.7
OpenSCAP
(6.1) ((, 6.3) 가
(6.4). (6.2) (6.6)
, ,
, 가
, 가

7.

OpenSCAP 가 , OpenSCAP
가 가

7.1. OpenSCAP

가 (: 2GB)

.24 “Out of memory: Killed process (oscap)” “Memory allocation failed”

가 .24

OSCAP_PROBE_MEMORY_USAGE_RATIO

OSCAP_PROBE_IGNORE_PATHS (: /home)

remediation , , oscap .24

7.2. SCAP : 가

.8 SCAP (XCCDF, OVAL)

가 (24 “ 가 ”

). OpenSCAP , SCAP

7.3. (Coverage Gaps):

SSG RHEL 8 CIS remediation 98%

CIS .18 100% 가

SSG 100% 가 .18

OpenSCAP 24

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)

remediation .21 OpenSCAP SCAP . SCAP

DoD , Nessus SCAP (: RHEL 8 SCAP

).21 Tenable(Nessus) Nessus SCAP

.21 : OpenSCAP 96%

Nessus 72% 25, 가

. SCAP .21 Remediation:

OpenSCAP remediation (: CIS Ansible) .18 Nessus remediation

.21 UI: OpenSCAP , Nessus GUI

.21 Nessus 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)

가 .22 : (, , OS)

22, Qualys 가 : OpenSCAP

SCAP / .22 Qualys IT, OT, IoT

가 가 .22

: OpenSCAP . Qualys VMDR (가

).22 : OpenSCAP () . Qualys

(가) . (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, ,	, ,

	OpenSCAP	Nessus (Tenable)	Qualys VMDR
	CLI (oscap), GUI (SCAP Workbench)	GUI (Nessus Pro, Tenable.io)	
	SCAP 가 , , ,	가, ,	가 , VMDR , MSSP,

OpenSCAP SCAP STIG CIS 가 . Nessus Qualys . OpenSCAP 가 , SCAP , OpenSCAP SCAP , Nessus Qualys SCAP . OpenSCAP 가 .21 SCAP SCAP 가 OpenSCAP 가 , “ ” SCAP .

9.

OpenSCAP , OpenSCAP

9.1. OpenSCAP: , API

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

[nt%20Automation%20Protocol%20\(SCAP\)%20checklists%20standardize%20and%20enable%20automation,800%2D53\)%20controls%20framework.](#)

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