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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)
NIST가 (NVD) .¹ SCAP SCAP
 ,
 .
 .¹ SCAP
가 ,
¹ .
SCAP NIST , 가 , NIST FISMA
 , FISMA .¹ NIST SCAP
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 (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
OpenSCAP 가 ,
(oscap) (SCAP Workbench)

3.1. OpenSCAP :

OpenSCAP⁵
SCAP Workbench, Red Hat Satellite SCAPTimony, OpenSCAP⁵
Daemon
SCAP⁵ OpenSCAP Base C API
SCAP¹¹ 가
, API
, OpenSCAP SCAP
가 , 가
. API
SCAP SCAP
SCAP

3.2. oscap:

oscap OpenSCAP⁵
XCCDF OVAL 가
⁵ SCAP 1.2 SCAP 1.1 1.0⁵
DISA STIG, NIST USGCB, PCI-DSS Red Hat 가⁵
oscap xccdf eval 가⁹, oscap info
⁹ oscap xccdf generate report ARF/XML HTML¹²
oscap (verbose)
(CLI)
. GUI
. oscap⁵, CLI OpenSCAP, CI/CD
(: 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
 . 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
 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 .
 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

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
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)

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

4.4. (Tailoring)

(Tailoring)

SCAP Workbench 13, (fork)

ID / 15

“ ” “ ” 15

가 SCAP

.15 OpenSCAP XCCDF 1.1 ,

openscap ¹³.

(: 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) CIS scap-security-guide
¹⁸.
oscap SSG
¹⁸ 가, oscap
remediation()
1 Level 2)
CIS
Ansible ¹⁸ OpenSCAP Ubuntu CIS
¹⁷, CIS (Level
--remediate
¹⁷.
OpenSCAP remediation ¹⁸, remediation
. , SSG RHEL 8 CIS remediation CIS 100%
98% ¹⁸.
remediation 가 . 100%
remediation 가 ,
.

5.2. DISA STIGs(Security Technical Implementation Guides)

DISA STIG (DoD)
⁵ SCAP 가 (SSG) STIG ²⁰ OpenSCAP DISA STIG 가
¹⁴ SSG DoD STIG Red Hat RHEL 6 DISA STIG SSG ¹⁴.
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
PCI-DSS	가		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
- 6.2. : SCAP
, SCAP .⁶ “ ”⁶, SCAP 가 가 .¹
- 6.3. (): OpenSCAP .⁴ SCAP
⁶, OpenSCAP(SCC + OVAL) Nessus
²¹ .²²
OpenSCAP .
- 6.4. :
⁷ 가 .⁸ OpenSCAP
⁷, remediation 가
- 6.5. : .⁷ CLI oscap
. OpenSCAP .
- 6.6. : Jenkins, Ansible .⁷

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

7.

OpenSCAP 가 OpenSCAP : OpenSCAP

가 (: 2GB)

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

가 .24 /

.24 OSCAP_PROBE_MEMORY_USAGE_RATIO (: /home)

OSCAP_PROBE_IGNORE_PATHS remediation , , oscap .24

. 7.2. SCAP 가 / 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 18 8

SCAP 가 SSG

SSG

8. OpenSCAP :

OpenSCAP 가 Nessus Qualys

VMDR OpenSCAP

8.1. OpenSCAP Nessus

OpenSCAP Nessus
/ : Nessus
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 , , ,
 .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		; SCAP 가	, SCAP / 가 가

	OpenSCAP	Nessus (Tenable)	Qualys VMDR
	(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 가 SCAP STIG CIS
Nessus Qualys
OpenSCAP SCAP 가
Nessus Qualys SCAP
OpenSCAP 가
OpenSCAP 가
OpenSCAP , “ ” SCAP

9.

OpenSCAP , OpenSCAP

9.1. OpenSCAP: , , API

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, OpenSCAP 18 가 OpenSCAP 가

10.

OpenSCAP OpenSCAP 가

10.1. OpenSCAP 가

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

10.2. OpenSCAP

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

, OpenSCAP

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