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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 (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 가

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 FS0, 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 , 가 (ARF, XCCDF)
가 (HTML)
OpenSCAP .
```

4.4. (Tailoring)

(Tailoring)

```
Workbench 13, (fork) SCAP ID
/ .15
“ ” “ ” .15 SCAP 가
.15 OpenSCAP XCCDF 1.1 , openscap
.13
```

14, (: SSG) (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
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 FSO NSA STIG 14
가 DoD , DoD
STIG
STIG 가 가 (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 .7
 : SCAP .1 . 6.2.
 “ ” 6, SCAP
 .6 가 가
 . 6.3. (): OpenSCAP .4 SCAP
 6, OpenSCAP(SCC + OVAL) Nessus
 .21 OpenSCAP .22
 . 6.4. :
 7, remediation .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 . OpenSCAP
 . 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
가 / 가
. 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
“ ” .18
SSG 100% 가
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 , , ,
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 (OVAL)		(VMDR),
	SCAP (XCCDF, OVAL, CPE, CVE)	, NASL, Tenable	
	()	(Nessus Pro, Tenable.io)	()
SCAP		; SCAP 가	, SCAP 가 / 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)	

	OpenSCAP	Nessus (Tenable)	Qualys VMDR
	SCAP 가	가,	가 , MSSP,
	,	,	
	,		

OpenSCAP 가 SCAP STIG CIS

. Nessus Qualys

. OpenSCAP 가

, OpenSCAP SCAP , Nessus Qualys SCAP

.21

OpenSCAP 가 SCAP SCAP

OpenSCAP 가 , “ ” 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 12, API 11, 18

OpenSCAP 가

OpenSCAP , 가

10.

OpenSCAP ,

가 OpenSCAP , , ,

10.1. OpenSCAP 가

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

10.2. OpenSCAP

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

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