

NIST Special Publication 800-126A

SCAP 1.3 Component Specification Version Updates

An Annex to NIST Special Publication 800-126 Revision 3

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David Waltermire
Lee Badger
Melanie Cook
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Karen Scarfone

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C O M P U T E R S E C U R I T Y

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Abstract

The Security Content Automation Protocol (SCAP) is a multi-purpose framework of component specifications that support automated configuration, vulnerability, and patch checking, security measurement, and technical control compliance activities. The SCAP version 1.3 specification is defined by the combination of NIST Special Publication (SP) 800-126 Revision 3, a set of schemas, and this document. This document allows the use of particular minor version updates to SCAP 1.3 component specifications and the use of particular Open Vulnerability and Assessment Language (OVAL) core schema and platform schema versions. Allowing use of these updates and schemas provides additional functionality for SCAP 1.3 without causing any loss of existing functionality.

Keywords

Open Vulnerability and Assessment Language (OVAL); security automation; security configuration; Security Content Automation Protocol (SCAP)

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Errata

This table will contain changes that have been incorporated into NIST Special Publication 800-126A after the publication is finalized. Errata updates can include corrections, clarifications, or other minor changes in the publication that are either *editorial* or *substantive* in nature.

Date	Type	Change	Pages

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1 Introduction

Specification versioning is the process of denoting a revision to a specification by changing its version number. For example, the Security Content Automation Protocol (SCAP) specification documents are updated from time to time, and these updates trigger an increase in the SCAP version number (1.0, 1.1, 1.2, etc.) What makes specification versioning challenging is that there is no standard convention or terminology for it; each specification imparts different meanings into its version numbers. For example, moving from version 3.4 to version 3.5 might break backward compatibility for one specification, add new functionality for another specification, and simply correct an error in a third specification.

This document defines two key terms for SCAP 1.3 component specification versioning: major and minor version updates. A *major version update* is a revision of a specification that breaks backward compatibility with the previous revision of the specification in numerous significant ways. A *minor version update* is a revision of a specification that may add or enhance functionality, fix bugs, and make other changes from the previous revision, but the changes have minimal impact, if any, on backward compatibility.

1.1 Purpose and Scope

The purpose of this document is to extend the contents of NIST Special Publication (SP) 800-126 Revision 3¹ so that SCAP 1.3 is defined by the combination of the two documents and the set of schemas. Readers should be familiar with NIST SP 800-126 Revision 3 before reading this document.

This document can only be used to make minor version updates of component specifications already included in SCAP 1.3 by NIST SP 800-126 Revision 3. Major version updates to SCAP 1.3 component specifications, as well as new component specifications not included in NIST SP 800-126 Revision 3, can only be added to a future version of SCAP as documented in a future revision of NIST SP 800-126.

Each SCAP 1.3 extension specified in this document takes one of two forms. First, it may allow the use of particular minor version updates to SCAP 1.3 component specifications, or the use of particular Open Vulnerability and Assessment Language (OVAL) platform schema versions that work in conjunction with the OVAL 5.11 core schema included in SCAP 1.3. Second, it may specify one or more requirements for using these updates or OVAL platform schemas in an SCAP 1.3-conformant manner.

This document specifies exactly which component specification minor version updates and OVAL platform schema versions may be used as part of SCAP 1.3 for several reasons, including the following:

- To support the interoperability of SCAP 1.3 tools and content

¹ <https://doi.org/10.6028/NIST.SP.800-126r3>

- To provide a basis for testing tools to ensure they comply with SCAP 1.3
- To reduce the burden on SCAP 1.3 tool and content developers by clearly defining all SCAP 1.3 extensions in a single place

While organizations are free to use SCAP 1.3 with any schema or specification that they choose in any manner they choose, such usage is not considered SCAP 1.3-conformant unless defined as such in this document or in NIST SP 800-126 Revision 3.

The scope of this document is versioning for SCAP 1.3 component specifications only.

1.2 Document Structure

The rest of this document consists of the following sections and appendices:

- Section 2 presents all minor version updates in SCAP 1.3 component specifications that have been approved for inclusion in SCAP 1.3, along with any corresponding requirements to be added to SCAP 1.3. This section also lists the criteria used to evaluate a minor version update for potential inclusion in SCAP 1.3.
- Section 3 specifies all OVAL platform schemas that have been approved for inclusion in SCAP 1.3, along with any corresponding requirements to be added to SCAP 1.3. This section also lists the criteria used to evaluate an OVAL platform schema for potential inclusion in SCAP 1.3.
- Section 4 is a placeholder for adding information on OVAL data types in the future.
- Section 5 describes the management processes for the document.
- Appendix A contains a list of acronyms and abbreviations used in the document.
- Appendix B contains a glossary for selected terms defined in the document.

2 Minor Version Updates in SCAP 1.3 Component Specifications

This section defines the criteria used to evaluate minor version updates in SCAP 1.3 component specifications for potential inclusion in SCAP 1.3, then lists all such updates that have been approved for inclusion in SCAP 1.3, along with any corresponding requirements added to SCAP 1.3. It also provides the current XML schema (XSD) and Schematron schema locations corresponding to all SCAP 1.3 component specifications.

2.1 Criteria for Potential Inclusion

The following defines the criteria that a minor version update to an SCAP 1.3 component specification and associated requirements must meet before being considered for potential inclusion in this document:

1. One or more of the following must be true:
 - a. The component specification is being revised strictly for bug fix or errata purposes. In other words, the update does not add new functionality or enhance existing functionality.
 - b. The new minor version of the component specification is already being used by tools and/or content.
 - c. The platform schema revision or component specification revision provides significant benefits, such as offering a solution for an important use case that previously had no solution.
2. The minor version update and associated requirements must not conflict with any existing SCAP 1.3 requirements, including minimizing any negative impact on backward compatibility.

2.2 Approved Minor Version Updates and SCAP 1.3 Requirements

The following SCAP 1.3 component specification minor version updates have been approved for inclusion in SCAP 1.3:

- OVAL 5.11.2²

See Table 1 for the schema location for the component specification listed above.

For all other component specifications, the versions listed in NIST SP 800-126 Revision 3 are the approved versions.

As of this writing, no requirements need to be added to SCAP 1.3 to support the approved component specification minor version updates.

² For more information on the changes from OVAL 5.11 to OVAL 5.11.2, see the changelog at <https://github.com/OVALProject/Language/wiki/Changelog>.

2.3 XML Schema and Schematron Schema Locations

Table 1 lists the XML schema (XSD) locations (and Schematron schema locations, when applicable) for the SCAP component specifications.

Table 1: SCAP XML Schema and Schematron Schema Locations

Prefix	XML Schema Location	Schematron Schema Location (if applicable) ³
AI	https://scap.nist.gov/schema/asset-identification/1.1/asset-identification_1.1.0.xsd	
ARF	https://scap.nist.gov/schema/asset-reporting-format/1.1/asset-reporting-format_1.1.0.xsd	Embedded in the schema
CPE Applicability Language	https://scap.nist.gov/schema/cpe/2.3/cpe-language_2.3.xsd	
CPE Dictionary	https://scap.nist.gov/schema/cpe/2.3/cpe-dictionary_2.3.xsd	
CPE Dictionary Extension	https://scap.nist.gov/schema/cpe/2.3/cpe-dictionary-extension_2.3.xsd	
CPE Naming	https://scap.nist.gov/schema/cpe/2.3/cpe-naming_2.3.xsd	
OCIL	https://scap.nist.gov/schema/ocil/2.0/ocil-2.0.xsd	Embedded in the schema
OVAL 5.11.2 Common	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-common-schema.xsd	
OVAL 5.11.2 Definitions	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-definitions-schema.xsd	https://scap.nist.gov/revision/1.3/oval-schematron-rules.zip
OVAL 5.11.2 Directives	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-directives-schema.xsd	
OVAL 5.11.2 Results	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-results-schema.xsd	https://scap.nist.gov/revision/1.3/oval-schematron-rules.zip
OVAL 5.11.2 System Characteristics	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-system-characteristics-schema.xsd	
OVAL 5.11.2 Variables	https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/oval-variables-schema.xsd	
SCAP constructs	https://scap.nist.gov/schema/scap/1.2/scap-constructs_1.2.xsd	https://scap.nist.gov/revision/1.3/scap-schematron-rules.zip
SCAP source data stream	https://scap.nist.gov/schema/scap/1.3/scap-source-data-stream_1.3.xsd	
SWID	http://standards.iso.org/iso/19770/-2/2015-current/schema.xsd	

³ A complete bundle of Schematron schemas for SCAP 1.3 can be found on the SCAP website at: <https://scap.nist.gov/revision/1.3/#schematron>.

Prefix	XML Schema Location	Schematron Schema Location (if applicable) ³
TMSAD	https://scap.nist.gov/schema/tmsad/1.0/tmsad_1.0.xsd	https://scap.nist.gov/schema/tmsad/1.0/tmsad_1.0.sch
XCCDF	https://scap.nist.gov/schema/xccdf/1.2/xccdf_1.2.xsd (XSD 1.0, where <code>xsd:import</code> statements use absolute URLs), https://scap.nist.gov/schema/xccdf/1.2/xccdf_1.2.zip (complete schema bundle, where <code>xsd:import</code> statements use relative URLs)	https://scap.nist.gov/schema/xccdf/1.2/xccdf_1.2.sch

3 OVAL Platform Schemas

OVAL version 5.11 introduced a new versioning policy that was a significant change from previous OVAL versions.⁴ OVAL is now divided into the Core and Platform Extension languages. The Core defines the general functionality for OVAL, while each Platform Extension defines functionality specific to a particular platform, such as an operating system or an application. The Core and Platform Extensions languages can be updated separately, which provides greater flexibility. Interoperability is supported by requiring each Platform Extension to be based on a particular version of the Core.

SCAP 1.3 supports the version(s) of the OVAL core schemas listed in Section 2 of this document. As a result, SCAP 1.3 could be extended to support one or more OVAL platform schemas that are based on the specified version(s) of the OVAL core schemas. Each OVAL platform schema has a composite version number; the first half corresponds to the core schema version it is based on, and the second half corresponds to the version of the platform schema itself. For example, a platform schema with version 5.11.2:1.0 would be the original version (1.0) of a platform schema based on core schema version 5.11.2. Some platform schemas used in SCAP may be based on earlier OVAL core schema versions. This works because the constructs supported in older OVAL core schema versions are expected to be supported in newer 5.x releases.

This section defines the criteria used to evaluate OVAL platform schema versions that work in conjunction with SCAP 1.3-conformant OVAL core schemas for potential inclusion in SCAP 1.3. It then lists all OVAL platform schema versions that have been approved for inclusion in SCAP 1.3, along with any corresponding requirements added to SCAP 1.3.

3.1 Criteria for Potential Inclusion

The following defines the criteria that an OVAL platform schema version and associated requirements must meet before being considered for potential inclusion in this document:

1. The OVAL platform schema version must correspond to an SCAP 1.3-conformant OVAL core schema version.
2. The OVAL platform schema version and associated requirements must not conflict with any existing SCAP 1.3 requirements. This includes preserving full backward compatibility.
3. One or more of the following must be true:
 - a. One or more platform vendors are already making significant use of the platform schema version.
 - b. One or more tool vendors are already making significant use of the platform schema version.
 - c. Operational organizations that are using SCAP 1.3-conformant tools to consume SCAP 1.3-conformant content are already making significant use of the platform schema version.

⁴ <https://ovalproject.github.io/documentation/policy/versioning/>

- d. The platform schema version provides significant benefits, such as offering a solution for an important use case that previously had no solution.
- e. SCAP content is available that makes significant use of the platform schema version.
- f. The OVAL Board has demonstrated that there are significant benefits to using the platform schema version in conjunction with the SCAP 1.3 component specifications.

3.2 Approved OVAL Platform Schema Versions and SCAP 1.3 Requirements

Table 2 lists the OVAL platform schema versions⁵ that have been approved for inclusion in SCAP 1.3. Note that it is not expected nor desired that all SCAP 1.3-conformant tools will implement all of these OVAL platform schema versions. Table 2 indicates which OVAL platform schema versions are in scope for SCAP 1.3. SCAP 1.3-conformant tools should only implement the ones that are relevant for the purposes of each tool.

Table 2: Approved OVAL Platform Schema Versions

Platform Name	Schema Version	Schema Locations
General		
Independent	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/independent-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/independent-system-characteristics-schema.xsd
Server/client operating system		
AIX (IBM)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/aix-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/aix-system-characteristics-schema.xsd
FreeBSD (The FreeBSD Project)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/freebsd-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/freebsd-system-characteristics-schema.xsd
HP-UX (HP Enterprise)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/hpux-definitions-schema.xsd System Characteristics Schema:

⁵ More information on some OVAL platform schema versions is available at <https://github.com/OVALProject/Language/wiki/Latest>.

Platform Name	Schema Version	Schema Locations
		https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/hpux-system-characteristics-schema.xsd
Linux	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/linux-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/linux-system-characteristics-schema.xsd
MacOS (Apple)	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/macos-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/macos-system-characteristics-schema.xsd
Solaris (Oracle Corporation)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/solaris-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/solaris-system-characteristics-schema.xsd
UNIX	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/unix-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/unix-system-characteristics-schema.xsd
Windows (Microsoft Corporation)	5.11.1:1.4	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/7fa7bba7b48f09decb732d00b2be032a487ff9fc/schemas/windows-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/7fa7bba7b48f09decb732d00b2be032a487ff9fc/schemas/windows-system-characteristics-schema.xsd
Hypervisor		
ESX (VMware)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/esx-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/esx-system-characteristics-schema.xsd
Mobile operating system		
Android (Google)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/android-definitions-schema.xsd

Platform Name	Schema Version	Schema Locations
		System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/android-system-characteristics-schema.xsd
iOS (Apple)	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/apple-ios-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/apple-ios-system-characteristics-schema.xsd
Networking device operations and configuration		
ASA (Cisco Systems)	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/asa-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/asa-system-characteristics-schema.xsd
CatOS (Cisco Systems)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/catos-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/catos-system-characteristics-schema.xsd
IOS (Cisco Systems)	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/ios-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/ios-system-characteristics-schema.xsd
IOS-XE (Cisco Systems)	5.11.1:1.2	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/iosxe-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/iosxe-system-characteristics-schema.xsd
JunOS (Juniper Networks)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/junos-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/junos-system-characteristics-schema.xsd
NETCONF (Internet Engineering Task Force [IETF])	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/netconf-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/netconf-system-characteristics-schema.xsd

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Platform Name	Schema Version	Schema Locations
		a16137d7efcab43b7900242e/schemas/netconf-system-characteristics-schema.xsd
PixOS (Cisco Systems)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/pixos-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/pixos-system-characteristics-schema.xsd
Application		
Apache (The Apache Software Foundation)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/apache-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/apache-system-characteristics-schema.xsd
SharePoint (Microsoft Corporation)	5.11.1:1.1	Definitions Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/sharepoint-definitions-schema.xsd System Characteristics Schema: https://raw.githubusercontent.com/OVALProject/Language/f3c1751b0ec9f77ca16137d7efcab43b7900242e/schemas/sharepoint-system-characteristics-schema.xsd

As of this writing, no requirements need to be added to SCAP 1.3 to support the approved OVAL platform schema versions.

4 Additional Information on OVAL Data Types

This section is reserved for future use in providing additional information on OVAL data types. As of this writing, no additional data types have yet been defined.

5 Document Management

As explained in Section 1, the combination of this document, NIST SP 800-126 Revision 3, and the set of schemas defines the SCAP 1.3 specification. Having two documents allows SCAP 1.3 extensions to be defined in a separate document without having to update and re-release NIST SP 800-126 Revision 3 itself each time. It is also more convenient for SCAP tool and content developers to have a separate document that lists only the extensions. The adoption of extensions will be driven by community needs and feedback, major changes to platforms, and other trends and events.

It is reasonable to expect that this document will be updated more often than NIST SP 800-126 Revision 3, but frequent updates to either document are not anticipated. Each update to either document may necessitate corresponding changes to NIST IR 7511, which defines the SCAP Validation Program derived test requirements (DTR). It is expected that revisions to NIST IR 7511 will cite the specific version of this document from which the test requirements are derived.

Appendix A—Acronyms and Abbreviations

Selected acronyms and abbreviations used in this document are defined below.

DTR	Derived Test Requirements
FOIA	Freedom of Information Act
IETF	Internet Engineering Task Force
IR	Internal Report
ITL	Information Technology Laboratory
NIST	National Institute of Standards and Technology
OVAL	Open Vulnerability and Assessment Language
SCAP	Security Content Automation Protocol
SP	Special Publication

Appendix B—Glossary

Selected terms used in this document are defined below. See the glossary appendix in NIST SP 800-126 Revision 3 for additional definitions.

Major version update	A revision of a specification that breaks backward compatibility with the previous revision of the specification in numerous significant ways.
Minor version update	A revision of a specification that may add or enhance functionality, fix bugs, and make other changes from the previous revision, but the changes have minimal impact, if any, on backward compatibility.
Specification versioning	The process of denoting a revision to a specification by changing its version number.