

# Software Package Data Exchange (SPDX®) Specification

Version: 1.1

Copyright © 2010-2012 Linux Foundation and its Contributors. This work is licensed under a [Creative Commons Attribution 3.0 Unported License](#) (reproduced in its entirety in Appendix III herein). All other rights are expressly reserved.

With thanks to Adam Cohn, Andrew Back, Ann Thornton, Bill Schineller, Bruno Cornec, Ciaran Farrell, Daniel German, Debra McGlade, Ed Warnicke, Eran Strod, Eric Thomas, Esteban Rockett, Gary O'Neill, Guillaume Rousseau, Jack Manbeck, Jaime Garcia, Jeff Luszcz, Jilayne Lovejoy, John Ellis, Karen Copenhaver, Kate Stewart, Kim Weins, Kirsten Newcomer, Marc-Etienne Vargenau, Mark Gisi, Marshall Clow, Martin Michlmayr, Martin von Willebrand, Michael J. Herzog, Michel Ruffin, Peter Williams, Phil Robb, Philip Odence, Philip Koltun, Pierre Lapointe, Rana Rahal, Scott K Peterson, Scott Lamons, Shane Coughlan, Steve Cropper, Stuart Hughes, Tom Callaway, and Thomas F. Incorvia for their contributions and assistance.

# TABLE OF CONTENTS

<b>1 RATIONALE.....</b>	<b>5</b>
1.1 CHARTER.....	5
1.2 DEFINITION.....	5
1.3 WHY IS A COMMON FORMAT FOR DATA EXCHANGE NEEDED?.....	5
1.4 WHAT DOES THIS SPECIFICATION COVER?.....	5
1.5 WHAT IS NOT COVERED IN THE SPECIFICATION?.....	6
1.6 FORMAT REQUIREMENTS:.....	6
1.7 CONFORMANCE.....	7
<b>2 SPDX DOCUMENT INFORMATION.....</b>	<b>8</b>
2.1 SPDX VERSION .....	8
2.2 DATA LICENSE .....	8
2.3 DOCUMENT COMMENT .....	9
<b>3 CREATION INFORMATION.....</b>	<b>11</b>
3.1 CREATOR.....	11
3.2 CREATED.....	11
3.3 CREATOR COMMENT.....	12
<b>4 PACKAGE INFORMATION.....</b>	<b>13</b>
4.1 PACKAGE NAME.....	13
4.2 PACKAGE VERSION.....	13
4.3 PACKAGE FILE NAME.....	14
4.4 PACKAGE SUPPLIER.....	14
4.5 PACKAGE ORIGINATOR.....	15
4.6 PACKAGE DOWNLOAD LOCATION.....	15
4.7 PACKAGE VERIFICATION CODE.....	16
4.8 PACKAGE CHECKSUM.....	17
4.9 SOURCE INFORMATION.....	17
4.10 CONCLUDED LICENSE.....	18
4.11 ALL LICENSES INFORMATION FROM FILES.....	19
4.12 DECLARED LICENSE.....	20
4.13 COMMENTS ON LICENSE .....	21
4.14 COPYRIGHT TEXT.....	22
4.15 PACKAGE SUMMARY DESCRIPTION.....	22
4.16 PACKAGE DETAILED DESCRIPTION.....	23
<b>5 OTHER LICENSING INFORMATION DETECTED.....</b>	<b>24</b>
5.1 IDENTIFIER ASSIGNED.....	24
5.2 EXTRACTED TEXT .....	24
5.3 LICENSE NAME.....	25
5.4 LICENSE CROSS REFERENCE.....	25
5.5 LICENSE COMMENT .....	26
<b>6 FILE INFORMATION.....</b>	<b>27</b>
6.1 FILE NAME.....	27
6.2 FILE TYPE.....	27
6.3 FILE CHECKSUM.....	28

6.4 CONCLUDED LICENSE.....	28
6.5 LICENSE INFORMATION IN FILE.....	30
6.6 COMMENTS ON LICENSE .....	30
6.7 COPYRIGHT TEXT.....	31
6.8 ARTIFACT OF PROJECT NAME.....	32
6.9 ARTIFACT OF PROJECT HOMEPAGE.....	32
6.10 ARTIFACT OF PROJECT UNIFORM RESOURCE IDENTIFIER.....	33
6.11 FILE COMMENT.....	33
<b>7 REVIEW INFORMATION.....</b>	<b>34</b>
7.1 REVIEWER.....	34
7.2 REVIEW DATE.....	34
7.3 REVIEW COMMENT.....	35
<b>APPENDIX I. STANDARD LICENSE LIST.....</b>	<b>36</b>
<b>APPENDIX II. RDF DATA MODEL IMPLEMENTATION .....</b>	<b>41</b>
SPDX® VOCABULARY SPECIFICATION.....	41
INTRODUCTION.....	41
CLASSES.....	42
PROPERTIES.....	47
INDIVIDUALS.....	59
AGENT AND TOOL IDENTIFIERS.....	61
<b>APPENDIX III. CREATIVE COMMONS ATTRIBUTION LICENSE 3.0 UNPORTED.....</b>	<b>62</b>

# 1 Rationale

## 1.1 Charter

To create a set of data exchange standards that enable companies and organizations to share license and component information (metadata) for software packages and related content with the aim of facilitating license and other policy compliance.

## 1.2 Definition

The Software Package Data Exchange (SPDX®) specification is a standard format for communicating the components, licenses and copyrights associated with a software package. An SPDX file is associated with a particular software package and contains information about that package in the SPDX format.

## 1.3 Why is a common format for data exchange needed?

Companies and organizations (collectively “Organizations”) are widely using and reusing open source and other software packages. Compliance with the associated licenses requires a set of analysis activities and due diligence that each Organization performs independently including a manual and/or automated scan of software and identification of associated licenses followed by manual verification. Software development teams across the globe use the same open source packages, but little infrastructure exists to facilitate collaboration on the analysis or share the results of these analysis activities. As a result, many groups are performing the same work leading to duplicated efforts and redundant information. The SPDX working group seeks to create a data exchange format so that information about software packages and related content may be collected and shared in a common format with the goal of saving time and improving data accuracy.

## 1.4 What does this specification cover?

**1.4.1**     SPDX Document Information: Meta data to associate analysis results with a specific version of the SPDX file and license for use.

**1.4.2**     Creation Information: Information about how, when, and by whom the SPDX file was created.

**1.4.3**     Package Information: Facts that are common properties of the entire package.

**1.4.4**     License Information: A list of common licenses likely to be encountered and a standardized naming convention for referring to these licenses and other licenses also found within an SPDX document. This naming convention will also be the basis for extending this set of common licenses over time.

**1.4.5**     File Information: Facts (e.g. copyrights, licenses) that are specific to each file included in the package.

**1.4.6**     Reviewer Information: Information when and by whom the SPDX file was reviewed.

**1.4.7**     Evolution hooks: A set of mechanisms that permit extending the specification in a structured manner under specific future versions of the specification.

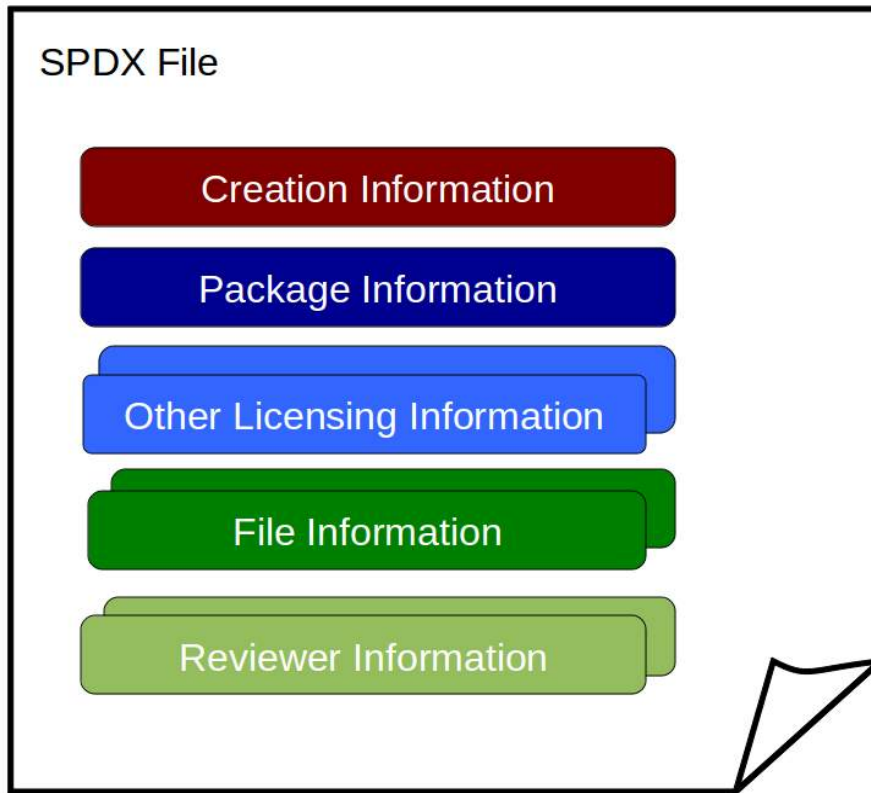


Figure 1. Overview of SPDX file contents.

## 1.5 What is not covered in the specification?

- 1.5.1** Information that cannot be derived from an inspection (whether manual or using automated tools) of the package to be analyzed.
- 1.5.2** How the data stored in an SPDX file is used by the recipient.
- 1.5.3** Any identification of any patent(s) which may or may not relate to the package.
- 1.5.4** Legal interpretation of the licenses or any compliance actions that have been or may need to be taken.

## 1.6 Format Requirements:

- 1.6.1** Must be in a human readable form.
- 1.6.2** Must be in a syntax that a software tool can read and write.
- 1.6.3** Must be suitable to be checked for syntactic correctness independent of how it was generated (human or tool).

- 1.6.4** The SPDX file character set must support UTF-8 encoding.
- 1.6.5** Must permit automated specification syntax validation.
- 1.6.6** Resource Description Framework (RDF) can be used to represent this information, as can an annotate tag value flat text file.
- 1.6.7** Interoperability with an annotate tag format and the RDF format will be preserved.

## **1.7 Conformance**

**1.7.1** A file can be designated an SPDX file, if it is compliant with the requirements of the SPDX Trademark License (See <http://www.spdx.org/trademark>).

**1.7.2** The official copyright notice to be used with any verbatim reproduction and/or distribution of this SPDX Specification 1.1 is:

"Official SPDX® Specification 1.1. Copyright © 2010-2012 Linux Foundation and its Contributors. Licensed under the Creative Commons Attribution License 3.0 Unported. All other rights are expressly reserved."

**1.7.3** The official copyright notice to be used with any non-verbatim reproduction and/or distribution of this SPDX Specification, including without limitation any partial use or combining this SPDX Specification with another work, is:

"This is not an official SPDX Specification. Portions herein have been reproduced from SPDX® Specification 1.1 found at [www.spdx.org](http://www.spdx.org). These portions are Copyright © 2010-2012 Linux Foundation and its Contributors, and are licensed under the Creative Commons Attribution License 3.0 Unported by the Linux Foundation and its Contributors. All other rights are expressly reserved by Linux Foundation and its Contributors."

## 2 SPDX Document Information

One instance is required for each SPDX file produced. It provides the necessary information for forward and backward compatibility for processing tools.

Fields:

### 2.1 SPDX Version

**2.1.1 Purpose:** Provide a reference number that can be used to understand how to parse and interpret the rest of the file. It will enable both future changes to the specification and to support backward compatibility. The version number consists of a major and minor version indicator. The major field will be incremented when incompatible changes between versions are made (one or more sections are created, modified or deleted). The minor field will be incremented when backwards compatible changes are made.

**2.1.2 Intent:** Here, parties exchanging information in accordance with SPDX specification need to provide 100% transparency as to which SPDX specification such Identification Information is conforming to.

**2.1.3 Cardinality:** Mandatory, one.

**2.1.4 Data Format:** "SPDX-M.N"  
where:  
M is major version number  
N is minor version number.

**2.1.5 Tag:** "SPDXVersion:"

**Example:**  
SPDXVersion: SPDX-1.1

**2.1.6 RDF:** spdx:specVersion

**Example:**  

```
<SpdxDocument rdf:about="http://www.spdx.org/tools#SPDXANALYSIS">
  <specVersion> SPDX-1.1 </specVersion>
</SpdxDocument>
```

### 2.2 Data License



**2.2.1 Purpose:** Compliance with the SPDX specification includes populating the SPDX fields therein with data related to such fields ("SPDX-Metadata"). The SPDX specification contains numerous fields where an SPDX author may provide relevant explanatory text in SPDX-Metadata. Without opining on the lawfulness of "database rights" (in jurisdictions where applicable), such explanatory text is copyrightable subject matter in most Berne Convention countries. By using the SPDX specification, or any portion hereof, you hereby agree that any copyright rights (as determined by your jurisdiction) in any SPDX-Metadata, including without limitation explanatory text, shall be subject to the terms of the below recited Creative Commons CC0 1.0 Universal license. For SPDX-Metadata not containing any copyright rights, you hereby agree and acknowledge that the SPDX-Metadata is provided to you "as-is" and without any representations or warranties of any kind concerning the SPDX-Metadata, express, implied, statutory or otherwise, including without limitation warranties of title, merchantability, fitness for a particular purpose, non infringement, or the absence of latent or other defects, accuracy, or the present or absence of errors, whether or not discoverable, all to the greatest extent permissible under applicable law.

**2.2.2 Intent:** This is to alleviate any concern that content (the data or database) in an SPDX file is subject to any form of intellectual property right that could restrict the re-use of the information or the creation of another SPDX file for the same project(s). This approach avoids intellectual property and related restrictions over the SPDX file, however individuals can still contract with each other to restrict release of specific collections of SPDX files (which map to software bill of materials) and the identification of the supplier of SPDX files.

**2.2.3 Cardinality:** Mandatory, one.

**2.2.4 Data Format:** "CC0-1.0"

**2.2.5 Tag:** "DataLicense:"

**Example:**

DataLicense: CC0-1.0

**2.2.6 RDF:** spdx:dataLicense

**Example:**

```
<SpdxDocument rdf:about"http://www.spdx.org/tools#SPDXANALYSIS">
  <dataLicense rdf:resource="http://spdx.org/licenses/CC0-1.0" />
</SpdxDocument>
```

## 2.3 Document Comment

**2.3.1 Purpose:** An optional field for creators of the SPDX file content to provide comments to the consumers of the SPDX document.

**2.3.2 Intent:** Here, the intent is to provide readers/reviewers with comments by the creator of the SPDX file about the SPDX document.

**2.3.3 Cardinality:** Optional, zero or one.

**2.3.4 Data Format:** free form text that can span multiple lines. In tag format this is delimited by <text> .. </text>, in RDF, it is delimited by <rdfs:comment>.

**2.3.5 Tag:** "DocumentComment:"

**Example:**

DocumentComment: <text>

This document was created using SPDX 1.1 using licenses from the web site.

</text>

### 2.3.6 RDF: property rdfs:comment in class SpdxDocument

**Example:**

```
<SpdxDocument rdf:about"http://www.spdx.org/tools#SPDXANALYSIS">  
  <rdfs:comment>  
    This document was created using SPDX 1.1 using licenses from the web site.  
  </rdfs:comment>  
</SpdxDocument>
```

### 3 Creation Information

One instance of the Creation Information field set is required per package instance.

Fields:

#### 3.1 Creator

**3.1.1 Purpose:** Identify who (or what, in the case of a tool) created the SPDX file. If the SPDX file was created by an individual, indicate the person's name. If the SPDX file was created on behalf of a company or organization, indicate the entity name. If the SPDX file was created using a software tool, the file should indicate the name and version for that tool. If multiple participants or tools were involved, use multiple instances of this field. Person name or organization name may be designated as "anonymous" if appropriate.

**3.1.2 Intent:** Here, the generation method will assist the recipient of the SPDX file in assessing the general reliability/accuracy of the analysis information.

**3.1.3 Cardinality:** Mandatory, one or many.

**3.1.4 Data Format:** single line of text with the following keywords:

"Person: person name" and optional "(email)"  
 "Organization: organization" and optional "(email)"  
 "Tool: toolidentifier-version"

**3.1.5 Tag:** "Creator:"

**Example:**

Creator: Person: Jane Doe ([jane.doe@example.com](mailto:jane.doe@example.com))  
 Creator: Organization: ExampleCodeInspect ([contact@example.com](mailto:contact@example.com))  
 Creator: Tool: LicenseFind-1.0

**3.1.6 RDF:** property `spdx:creator` in class `spdx:CreationInfo`

**Example:**

```
<CreationInfo>
  <creator> Person: Jane Doe (jane.doe@example.com) </creator>
  <creator> Organization: ExampleCodeInspect (contact@example.com) </creator>
  <creator> Tool: LicenseFind-1.0 </creator>
</CreationInfo>
```

#### 3.2 Created

**3.2.1 Purpose:** Identify when the SPDX file was originally created. The date is to be specified according to combined data and time in UTC format as specified in ISO 8601 standard. This field is distinct from the fields in section 7 which involves the addition of information during a subsequent review.

**3.2.2 Intent:** Here, the time stamp can serve as a verification as to whether the analysis needs to be updated.

**3.2.3 Cardinality:** Mandatory, one.

- 3.2.4 Data Format:** YYYY-MM-DDThh:mm:ssZ  
 where:  
     **YYYY** is year  
     **MM** is month with leading zero  
     **DD** is day with leading zero  
     **T** is delimiter for time  
     **hh** is hours with leading zero in 24 hour time  
     **mm** is minutes with leading zero  
     **ss** is seconds with leading zero  
     **Z** is universal time indicator
- 3.2.5 Tag:** "Created:"
- Example:**  
 Created: 2010-01-29T18:30:22Z
- 3.2.6 RDF: property** spdx:created **in class** spdx:CreationInfo
- Example:**  
 <CreationInfo>  
     <created> 2010-01-29T18:30:22Z </created>  
 </CreationInfo>

### 3.3 Creator Comment

- 3.3.1 Purpose:** An optional field for creators of the SPDX file to provide general comments about the creation of the SPDX file or any other relevant comment not included in the other fields.
- 3.3.2 Intent:** Here, the intent is to provide recipients of the SPDX file with comments by the creator of the SPDX file.
- 3.3.3 Cardinality:** Optional, one.
- 3.3.4 Data Format:** free form text that can span multiple lines.  
 In tag format this is delimited by <text> .. </text>, in RDF, it is delimited by <rdfs:comment>.
- 3.3.5 Tag:** "CreatorComment:"
- Example:**  
 CreatorComment: <text>  
 This package has been shipped in source and binary form.  
 The binaries were created with gcc 4.5.1 and expect to link to  
 compatible system run time libraries.  
 </text>
- 3.3.6 RDF: property** rdfs:comment **in class** spdx:CreationInfo
- Example:**  
 <CreationInfo>  
     <rdfs:comment> This package has been shipped in source and binary form.  
     The binaries were created with gcc 4.5.1 and expect to link to  
     compatible system run time libraries. </rdfs:comment>  
 </CreationInfo>

## 4 Package Information

One instance of the Package Information is required per package being analyzed. A package can contain sub-packages, but the information in this section is a reference to the entire contents of the package listed.

Fields:

### 4.1 Package Name

**4.1.1 Purpose:** Identify the full name of the package as given by Package Originator.

**4.1.2 Intent:** Here, the formal name of each package is an important conventional technical identifier to be maintained for each package.

**4.1.3 Cardinality:** Mandatory, one.

**4.1.4 DataFormat:** single line of text.

**4.1.5 Tag:** "PackageName:"

**Example:**

PackageName: glibc

**4.1.6 RDF: property** spdx:name in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <name>glibc</name>
</Package>
```

### 4.2 Package Version

**4.2.1 Purpose:** Identify the version of the package .

**4.2.2 Intent:** The versioning of a package is a useful for identification purposes and for indicating later changes for the package version.

**4.2.3 Cardinality:** Optional, one.

**4.2.4 DataFormat:** single line of text.

**4.2.5 Tag:** "PackageVersion:"

**Example:**

PackageVersion: 2.11.1

**4.2.6 RDF: property** spdx:versionInfo in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <versionInfo>2.11.1</versionInfo>
</Package>
```

## 4.3 Package File Name

**4.3.1 Purpose:** Provide the actual file name of the package. This may include the packaging and compression methods used as part of the file name.

**4.3.2 Intent:** Here, the actual file name of the compressed file containing the package is a significant technical element that needs to be included with each package identification information.

**4.3.3 Cardinality:** Optional, one.

**4.3.4 Data Format:** single line of text.

**4.3.5 Tag:** "PackageFileName:"

**Example:**

PackageFileName: glibc-2.11.1.tar.gz

**4.3.6 RDF: property** `spdx:packageFileName` in **class** `spdx:Package`

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <packageFileName>glibc 2.11.1.tar.gz</packageFileName>
</Package>
```

## 4.4 Package Supplier

**4.4.1 Purpose:** Identify the actual distribution source for the package identified in the SPDX file. This may or may not be different from the originating distribution source for the package. The name of the Package Supplier must be an organization or recognized author and not a web site. For example, Sourceforge is a host website, not a supplier, the supplier for `http://sourceforge.net/projects/bridge/` is "The Linux Foundation." NOASSERTION should be used if:

- (i) the SPDX file creator has attempted to but cannot reach a reasonable objective determination of who the supplier is;
- (ii) the project is orphaned and was obtained from a public website; or
- (iii) the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so).

**4.4.2 Intent:** This field assists with understanding the point of distribution for the code in the package. This field is vital for ensuring that a downstream package recipients can address any ambiguity or concerns that might arise with the information in the SPDX file or the contents of the package it documents.

**4.4.3 Cardinality:** Optional, one.

**4.4.4 Data Format:** single line of text with the following keywords | "NOASSERTION"

```
"Person:" person name and optional "("email")"
"Organization:" organization name and optional "(email)"
```

**4.4.5 Tag:** "PackageSupplier:"

**Example:**

PackageSupplier: Person: Jane Doe (jane.doe@example.com)

**4.4.6 RDF: property spdx:supplier in class spdx:Package****Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <supplier>Person: Jane Doe (jane.doe@example.com) </supplier>
</Package>
```

**4.5 Package Originator**

**4.5.1 Purpose:** If the package identified in the SPDX file originated from a different person or organization than identified as Package Supplier (see section 4.4 above), this field identifies from where or whom the package originally came. In some cases a package may be created and originally distributed by a different third party than the Package Supplier of the package. For example, the SPDX file identifies the package glibc and Red Hat as the Package Supplier, but Free Software foundation is the Package Originator. NOASSERTION should be used if:

- (i) the SPDX file creator has attempted to but cannot reach a reasonable objective determination of who the supplier is;
- (ii) the project is orphaned and was obtained from a public website; or
- (iii) the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so).

**4.5.2 Intent:** This field assists with understanding the point of origin of the code in the package. This field is vital for understanding who originally distributed a package and should help in addressing any ambiguity or concerns that might arise with the information in the SPDX file or the contents of the Package it documents.

**4.5.3 Cardinality:** Optional, one.

**4.5.4 Data Format:** single line of text with the following keywords | "NOASSERTION"

```
"Person:" person name and optional "(" email ")"
"Organization:" organization name and optional "(" email ")"
```

**4.5.5 Tag:** "PackageOriginator:"

**Example:**

```
PackageOriginator: Organization: ExampleCodeInspect (contact@example.com)
```

**4.5.6 RDF: property spdx:originator in class spdx:Package****Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <originator>Organization: ExampleCodeInspect (contact@example.com)
</originator>
</Package>
```

**4.6 Package Download Location**

**4.6.1 Purpose:** This field identifies the download Universal Resource Locator (URL) for the package at the time that the SPDX file was created. If there is no public URL, then it is explicitly marked as NONE. If there is insufficient knowledge about whether a public site exists or not, then NOASSERTION (which was considered UNKNOWN in SPDX 1.0) should be used.

**4.6.2 Intent:** Here, where to download the exact package being referenced is a critical verification and tracking datum.

**4.6.3 Cardinality:** Mandatory, one.

**4.6.4 Data Format:** uniform resource locator | "NONE" | "NOASSERTION"

**4.6.5 Tag:** "PackageDownloadLocation:"

**Example:**

PackageDownloadLocation: <http://ftp.gnu.org/gnu/glibc/glibc-2.11.2.tar.gz>

**4.6.6 RDF:** property `spdx:downloadLocation` in class `spdx:Package`

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <downloadLocation>
    http://ftp.gnu.org/gnu/glibc/glibc-2.11.2.tar.gz
  </downloadLocation>
</Package>
```

## 4.7 Package Verification Code

**4.7.1 Purpose:** This field provides an independently reproducible mechanism identifying specific contents of a package based on the actual files (except the SPDX file itself, if it is included in the package) that make up each package and that correlates to the data in this SPDX file. This identifier enables a recipient to determine if any file in the original package (that the analysis was done on) has been changed and permits inclusion of an SPDX file as part of a package.

**4.7.2 Intent:** Providing a unique identifier based on the files inside each package, eliminates confusion over which version or modification of a specific package the SPDX file refers to. It also permits one to embed the SPDX file within the package without altering the identifier.

**4.7.3 Cardinality:** Mandatory, one.

**4.7.4 Algorithm:**

```
verificationcode = 0
filelist = templist = ""
for all files in the package {
  if file is an "excludes" file, skip it /* exclude SPDX analysis file(s) */
  appended templist with "SHA1(file)/n"
}
sort templist in ascending order by SHA1 value
filelist = templist with "/n"s removed. /* ordered sequence of SHA1 values with no separators */
verificationcode = SHA1(filelist)
```

Where `SHA1(file)` applies a SHA1 algorithm on the contents of file and returns the result in lowercase hexadecimal digits.

Preferred sort order: '0','1','2','3','4','5','6','7','8','9','a','b','c','d','e','f' (ASCII order)

See reference: <http://unicode.org/reports/tr10/>

**4.7.5 Data Format:** single line of text with 160 bit binary represented as 40 hexadecimal digits

**4.7.6 Tag:** "PackageVerificationCode:" (and optionally "(excludes: FileName)")  
where FileName is as specified in 6.1.

**Example:**

PackageVerificationCode: d6a770ba38583ed4bb4525bd96e50461655d2758 (excludes: ./package.spdx)



#### 4.7.7 **RDF:** `spdx:packageVerificationCodeValue`, `spdx:packageVerificationCodeExcludedFile` in **class** `spdx:PackageVerificationCode`

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <packageVerificationCode>
    <PackageVerificationCode>
      <packageVerificationCodeValue>d6a770ba38583ed4bb4525bd96e50461655d2758
      </packageVerificationCodeValue>
      <packageVerificationCodeExcludedFile> ./package.spdx
      </packageVerificationCodeExcludesFile>
    </PackageVerificationCode>
  </packageVerificationCode>
</Package>
```

## 4.8 Package Checksum

**4.8.1 Purpose:** This field provides an independently reproducible mechanism that permits unique identification of a specific package that correlates to the data in this SPDX file. This identifier enables a recipient to determine if any file in the original package has been changed. If the SPDX file is to be included in a package, this value should not be calculated. The SHA-1 algorithm will be used to provide the checksum by default.

**4.8.2 Intent:** Here, by providing a unique identifier of each the package, confusion over which version or modification of a specific package the SPDX file references should be eliminated.

**4.8.3 Cardinality:** Optional, one.

**4.8.4 Algorithm: SHA1** (<http://tools.ietf.org/html/rfc3174>) is to be used on the package.

**4.8.5 Data Format:** There are two components, an algorithm identifier("SHA1") and a 160 bit value represented as 40 lowercase hexadecimal digits.

**4.8.6 Tag:** "PackageChecksum:"

**Example:**

PackageChecksum: SHA1: d6a770ba38583ed4bb4525bd96e50461655d2758

**4.8.7 **RDF: properties**** `spdx:algorithm`, `spdx:checksumValue` in **class** `spdx:checksum`

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <checksum>
    <Checksum>
      <algorithm rdf:resource="checksumAlgorithm_sha1"/>
      <checksumValue> d6a770ba38583ed4bb4525bd96e50461655d2758
      </checksumValue>
    </Checksum>
  </checksum>
</Package>
```

## 4.9 Source Information

**4.9.1 Purpose:** This field provides a place for the SPDX file creator to record any relevant background information or additional comments about the origin of the package. For example, this field might include comments indicating whether the package been pulled from a source code management system or has been repackaged.

**4.9.2 Intent:** Here, by providing a comment field, the SPDX file creator can provide additional information to describe any anomalies or discoveries in the determination of the origin of the package.

**4.9.3 Cardinality:** Optional, one.

**4.9.4 Data Format:** free form text that can span multiple lines.  
In tag format this is delimited by <text> .. </text>.

**4.9.5 Tag:** "PackageSourceInfo:"

**Example:**

PackageSourceInfo: uses glibc-2\_11-branch from git://sourceware.org/git/glibc.git.

**4.9.6 RDF:** spdx:sourceInfo

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <sourceInfo>uses glibc-2_11-branch from git://sourceware.org/git/glibc.git.
</sourceInfo>
</Package>
```

## 4.10 Concluded License

**4.10.1 Purpose:** This field contains the license the SPDX file creator has concluded as governing the package or alternative values, if the governing license cannot be determined. The options to populate this field are limited to:

- (a) the SPDX License List short form identifier, if the concluded license is on the SPDX License List;
- (b) a reference to the license text denoted by the LicenseRef-#, if the concluded license is not on the SPDX License List;
- (c) NOASSERTION should be used if:
  - (i) the SPDX file creator has attempted to but cannot reach a reasonable objective determination of the Concluded License;
  - (ii) the SPDX file creator is uncomfortable concluding a license, despite some license information being available;
  - (iii) the SPDX file creator has made no attempt to determine a Concluded License;
  - (iv) the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so); or
  - (v) there is no licensing information from which to conclude a license for the package.

With respect to (a) and (b) above, if there is more than one concluded license, all should be included. If the package recipient has a choice of multiple licenses, then each of the choices should be recited as a "disjunctive" license. If the Concluded License is not the same as the Declared License, a written explanation should be provided in the Comments on License field (section 4.13). With respect to (c), a written explanation in the Comments on License field (section 4.13) is preferred.

**4.10.2 Intent:** Here, the intent is for the SPDX file creator to analyze the license information in package, and other objective information, e.g., COPYING file, together with the results from any scanning tools, to arrive at a reasonably objective conclusion as to what license governs the package.

**4.10.3 Cardinality:** Mandatory, one.

**4.10.4 Data Format:** <short form identifier in Appendix I> | "LicenseRef"-N | "NOASSERTION" | "NONE" | <license set>

**4.10.5 Tag:** "PackageLicenseConcluded:"  
For a license set, when there is a choice between licenses ("disjunctive license"), they should be separated with "or" and enclosed in parentheses. When multiple licenses apply ("conjunctive license"), they should be separated with an "and" and enclosed in parentheses.

**Example:**

PackageLicenseConcluded: LGPL-2.0

**Example:**

PackageLicenseConcluded: (LGPL-2.0 or LicenseRef-3)

**4.10.6 RDF: property** spdx:licenseConcluded in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <licenseConcluded> rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
</Package>
```

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <licenseConcluded>
    <DisjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
      <member rdf:resource="_:licenseRef-3" />
    </DisjunctiveLicenseSet>
  </licenseConcluded>
</Package>
```

## 4.11 All Licenses Information from Files

**4.11.1 Purpose:** This field is to contain a list of all licenses found in the package. The relationship between licenses (i.e., conjunctive, disjunctive) is not specified in this field – it is simply a listing of all licenses found. The options to populate this list are limited to:

- (a) the SPDX License List short form identifier, if a detected license is on the SPDX License List;
- (b) a reference to the license, denoted by LicenseRef-#, if the detected license is not on the SPDX License List;
- (c) NONE, if no license information is detected in any of the files; or
- (d) NOASSERTION, if the SPDX file creator has not examined the contents of the actual files or if the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so).

**4.11.2 Intent:** Here, the intention is to capture all license information detected in the actual files.

**4.11.3 Cardinality:** Mandatory, one or many.

**4.11.4 Data Format:** <short form identifier in Appendix I> | "LicenseRef"-N | "NONE" | "NOASSERTION"

**4.11.5 Tag:** "PackageLicenseInfoFromFiles:"

**Example:**

PackageLicenseInfoFromFiles: GPL-2.0  
 PackageLicenseInfoFromFiles: LicenseRef-1  
 PackageLicenseInfoFromFiles: LicenseRef-2

**4.11.6 RDF: property** spdx:licenseInfoFromFiles in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <licenseInfoFromFiles rdf:resource="http://spdx.org/licenses/GPL-2.0" />
  <licenseInfoFromFiles rdf:resource="_.licenseRef-1" />
  <licenseInfoFromFiles rdf:resource="_.licenseRef-2" />
</Package>
```

## 4.12 Declared License

**4.12.1 Purpose:** This field lists the licenses that have been declared by the authors of the package. Any license information that does not originate from the package authors, e.g. license information from a third party repository, should not be included in this field. The options to populate this field are limited to:

- (a) the SPDX License List short form identifier, if the license is on the SPDX License List;
- (b) a reference to the license, denoted by LicenseRef-#, if the declared license is not on the SPDX License List;
- (c) NONE, if no license information is detected in any of the files; or
- (d) NOASSERTION, if the SPDX file creator has not examined the contents of the package or if the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so).

With respect to "a" and "b" above, if license information for more than one license is contained in the file, all should be reflected in this field. If the license information offers the package recipient a choice of licenses, then each of the choices should be recited as "disjunctive" licenses.

**4.12.2 Intent:** This is simply the license identified in text in one or more files (for example COPYING file) in the source code package. This field is not intended to capture license information obtained from an external source, such as the package website. Such information can be included in 4.10 Concluded License. This field may have multiple declared licenses, if multiple licenses are declared at the package level.

**4.12.3 Cardinality:** Mandatory, one.

**4.12.4 Data Format:** <short form identifier in Appendix I> | "LicenseRef"-N | "NONE" | "NOASSERTION" | <license set>

**4.12.5 Tag: "PackageLicenseDeclared:"**

For a license set, when there is a choice between licenses ("disjunctive license"), they should be separated with "or" and enclosed in parentheses. Similarly, when multiple licenses need to be applied ("conjunctive license"), they should be separated with "and" and enclosed in parentheses.

**Example:**

PackageLicenseDeclared: LGPL-2.0

**Example:**

PackageLicenseDeclared: (LGPL-2.0 and LicenseRef-3)

**4.12.6 RDF: property `spdx:licenseDeclared` in class `spdx:Package`****Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <licenseDeclared rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
</Package>
```

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <licenseDeclared>
    <DisjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
      <member rdf:resource="_:licenseRef-3" />
    </DisjunctiveLicenseSet>
  </licenseDeclared>
</Package>
```

**4.13 Comments on License**

**4.13.1 Purpose:** This field provides a place for the SPDX file creator to record any relevant background information or analysis that went in to arriving at the Concluded License for a package. If the Concluded License does not match the Declared License or License Information from Files, this should be explained by the SPDX file creator. Its is also preferable to include an explanation here when the Concluded License is NOASSERTION.

**4.13.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with a detailed explanation of how the Concluded License was determined if it does not match the License Information from the files or the source code package, is marked NOASSERTION, or other helpful information relevant to determining the license of the package.

**4.13.3 Cardinality:** Optional, one.

**4.13.4 Data Format:** free form text that can span multiple lines.  
In tag format this is delimited by `<text> .. </text>`,  
in RDF, it is delimited by `<licenseComments>`.

**4.13.5 Tag: "PackageLicenseComments:"**

**Example:**

PackageLicenseComments: <text>

The license for this project changed with the release of version x.y. The version of the project included here post-dates the license change.

</text>

**4.13.6 RDF: property** spdx:licenseComments **in class** spdx:Package**Example:**

<Package rdf:about="<http://www.spdx.org/toolsSPDXANALYSIS?package>">

<licenseComments>

This package has been shipped in source and binary form.

The binaries were created with gcc 4.5.1 and expect to link to compatible system run time libraries.

</licenseComments>

</Package>

**4.14 Copyright Text**

**4.14.1 Purpose:** Identify the copyright holders of the package, as well as any dates present. This will be a free form text field extracted from the package information files. The options to populate this field are limited to:

- (a) any text related to a copyright notice, even if not complete;
- (b) NONE if the package contains no license information whatsoever; or
- (c) NOASSERTION, if the SPDX file creator has not examined the contents of the package or if the SPDX file creator has intentionally provided no information(no meaning should be implied by doing so).

**4.14.2 Intent:** Record any copyright notices for the package.

**4.14.3 Cardinality:** Mandatory, one.

**4.14.4 Data Format:** free form text that can span multiple lines | "NOASSERTION" | "NONE"

**4.14.5 Tag:** "PackageCopyrightText:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

PackageCopyrightText: <text>

Copyright 2008-2010 John Smith

</text>

**4.14.6 RDF: property** spdx:copyrightText **in class** spdx:Package**Example:**

<Package rdf:about="<http://www.spdx.org/tools#SPDXANALYSIS?package>">

<copyrightText>

Copyright 2008-2010 John Smith

</copyrightText>

</Package>

**4.15 Package Summary Description**

**4.15.1 Purpose:** This field is a short description of the package

**4.15.2 Intent:** Here, the intent is to allow the recipient of the SPDX file to quickly understand the function or use of the package without having to parse the source code of the actual package.

**4.15.3 Cardinality:** Optional, one.

**4.15.4 Data Format:** free form text that can span multiple lines.

**4.15.5 Tag:** "PackageSummary:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

PackageSummary: <text> GNU C library. </text>

**4.15.6 RDF: property** spdx:summary in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <summary> GNU C library.</summary>
</Package>
```

## 4.16 Package Detailed Description

**4.16.1 Purpose:** This field is a more detailed description of the package. It may also be extracted from the packages itself.

**4.16.2 Intent:** Here, the intent is to provide recipients of the SPDX file with a detailed technical explanation of the functionality, anticipated use, and anticipated implementation of the package. This field may also include a description of improvements over prior versions of the package.

**4.16.3 Cardinality:** Optional, one.

**4.16.4 Data Format:** free form text than can span multiple lines.

**4.16.5 Tag:** "PackageDescription:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

PackageDescription: <text>

The GNU C Library defines functions that are specified by the ISO C standard, as well as additional features specific to POSIX and other derivatives of the Unix operating system, and extensions specific to GNU systems.  
</text>

**4.16.6 RDF: property** spdx:description in **class** spdx:Package

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <description>
    The GNU C Library defines functions that are specified by the
    ISO C standard, as well as additional features specific to POSIX and other
    derivatives of the Unix operating system, and extensions specific to GNU systems.
  </description>
</Package>
```

## 5 Other Licensing Information Detected

This section is used for any detected, declared or concluded licenses that are NOT on the SPDX License List. For the most up-to-date version of the list see: <http://spdx.org/licenses/>. The SPDX License List can also be found here in Appendix I.

One instance should be created for every unique license or licensing information reference detected in package that does not match one of the licenses on the SPDX License List. Each license instance should have the following fields.

Fields:

### 5.1 Identifier Assigned

**5.1.1 Purpose:** Provide a unique identifier to refer to licenses that are not found on the SPDX License List. This unique identifier can then be used in the packages and files sections of the SPDX file (sections 4 and 6, respectively).

**5.1.2 Intent:** Create a short form license identifier for license not on the SPDX License List.

**5.1.3 Cardinality:** Conditional (mandatory, one) if license is not on SPDX License List.

**5.1.4 Data Format:** "LicenseRef-"N where N is a unique numeric value.

**5.1.5 Tag:** "LicenseID:"

**Example:**

LicenseID: LicenseRef-1

**5.1.6 RDF: property** spdx:licenseID in **class** spdx:ExtractedLicensingInfo

**Example:**

```
< ExtractedLicensingInfo rdf:about="" :licenseRef-1>
  <licenseID> LicenseRef-1 </licenseID>
</ExtractedLicensingInfo>
```

### 5.2 Extracted Text

**5.2.1 Purpose:** Provide a copy of the actual text of the license reference extracted from the package or file that is associated with the License ID to aid in future analysis.

**5.2.2 Intent:** Provide the actual text as found in the package or file for a license that is not on the SPDX License List.

**5.2.3 Cardinality:** Conditional (Mandatory, one) if there is an Identifier Assigned.

**5.2.4 Data Format:** free form text field that may span multiple lines.

**5.2.5 Tag:** "ExtractedText:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

ExtractedText: <text>"THE BEER-WARE LICENSE" (Revision 42):  
<phk@FreeBSD.ORG> wrote this file. As long as you retain this notice you  
can do whatever you want with this stuff. If we meet some day, and you think this stuff

Official SPDX® Specification 1.1.

Copyright © 2010-2012 Linux Foundation and its Contributors.

Licensed under the Creative Commons Attribution License 3.0 Unported.

All other rights are expressly reserved.



is worth it, you can buy me a beer in return Poul-Henning Kamp </text>

**5.2.6 RDF: property** `spdx:extractedText` in **class** `spdx:ExtractedLicensingInfo`

**Example:**

```
<ExtractedLicensingInfo rdf:about="" :licenseRef-1>
  <licenseId> LicenseRef-1 </licenseId>
  <extractedText> "THE BEER-WARE LICENSE" (Revision 42):
    <phk@FreeBSD.ORG> wrote this file. As long as you retain this notice you
    can do whatever you want with this stuff. If we meet some day, and you think
    this stuff is worth it, you can buy me a beer in return Poul-Henning Kamp
  </extractedText>
</ExtractedLicensingInfo>
```

## 5.3 License Name

**5.3.1 Purpose:** Common name of the license not on the SPDX list. If there is no common name or it is not known, please use NOASSERTION.

**5.3.2 Intent:** Provides a human readable name suitable for use as a title or label of the license when showing compact lists of licenses from the SPDX data to humans.

**5.3.3 Cardinality:** Conditional (mandatory, one) if license is not on SPDX License List.

**5.3.4 Data Format:** single line of text | "NOASSERTION".

**5.3.5 Tag:** "LicenseName:"

**Example:**

LicenseName: Beer-Ware License (Version 42)

**5.3.6 RDF: property** `spdx:licenseName` in **class** `spdx:ExtractedLicensingInfo`

**Example:**

```
<ExtractedLicensingInfo rdf:about="" :licenseRef-1>
  <licenseName> Beer-Ware License (Version 42) </licenseName>
</ExtractedLicensingInfo>
```

## 5.4 License Cross Reference

**5.4.1 Purpose:** Provide a pointer to the official source of a license that is not included in the SPDX table, that is referenced by the id.

**5.4.2 Intent:** Canonical source for a license currently not on the SPDX License List.

**5.4.3 Cardinality:** Conditional (optional, one or more) if license is not on SPDX License List.

**5.4.4 Data Format:** uniform resource locator

**5.4.5 Tag:** "LicenseCrossReference:"

**Example:**

LicenseCrossReference: <http://people.freebsd.org/~phk/>

**5.4.6 RDF: property** `rdfs:seeAlso` in **class** `spdx:ExtractedLicensingInfo`

**Example:**

```
<ExtractedLicensingInfo rdf:about="" _:licenseRef-1>
  <rdfs:seeAlso> http://people.freebsd.org/~phk/ </rdfs:seeAlso>
</ExtractedLicensingInfo>
```

## 5.5 License Comment

**5.5.1 Purpose:** This field provides a place for the SPDX file creator to record any general comments about the license.

**5.5.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with more information determined after careful analysis of a license, or addition cross references.

**5.5.3 Cardinality:** Optional, one.

**5.5.4 Data Format:** free form text that can span multiple lines

**5.5.5 Tag:** "LicenseComment:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

```
LicenseComment: <text>
The beerware license has a couple of other standard variants.
</text>
```

**5.5.6 RDF: property** rdfs:comment in **class** spdx:ExtractedLicensingInfo

**Example:**

```
< ExtractedLicensingInfo rdf:about="" _:licenseRef-1>
  <rdfs:comment> The beerware license has a couple of other standard variants.
  </rdfs:comment>
</ExtractedLicensingInfo>
```

## 6 File Information

One instance of the File Information is required for each file in the software package. It provides important meta information about a given file including licenses and copyright. Each instance should include the following fields.

Fields:

### 6.1 File Name

**6.1.1 Purpose:** Identify the full path and filename that corresponds to the file information in this section.

**6.1.2 Intent:** To aid finding the correct file which corresponds to the file information.

**6.1.3 Cardinality:** Mandatory, one.

**6.1.4 Data Format:** A relative filename with the root of the package archive or directory. See <http://tools.ietf.org/html/rfc1738> for syntax.

**6.1.5 Tag:** "FileName:"

**Example:**

FileName: ./package/foo.c

**6.1.6 RDF: property** spdx:fileName in **class** spdx:File

**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <fileName>./package/foo.c</fileName>
</File>
```

### 6.2 File Type

**6.2.1 Purpose:** This field provides information about the type of file identified. This information can be determinative of license compliance requirements. The options to populate this field are limited to:

- (a) SOURCE if the file is human readable source code (.c, .html, etc.);
- (b) BINARY if the file is a compiled object or binary executable (.o, .a, etc.);
- (c) ARCHIVE if the file represents an archive (.tar, .jar, etc.); or
- (d) OTHER if the file doesn't fit into the above categories (pictures, audio, data files, etc.)

**6.2.2 Intent:** Here, this field is a reasonable estimation of the file type, from a developer perspective.

**6.2.3 Cardinality:** Optional, one.

**6.2.4 Data Format:** "SOURCE" | "BINARY" | "ARCHIVE" | "OTHER"

**6.2.5 Tag:** "FileType:"

**Example:**

FileType: BINARY

**6.2.6 RDF: property** `spdx:fileType` in **class** `spdx:File`**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <fileType rdf:resource="fileType_binary" />
</File>
```

**6.3 File Checksum**

**6.3.1 Purpose:** Provide a unique identifier to match analysis information on each specific file in a package.

**6.3.2 Intent:** Here, by providing a unique identifier of each file, confusion over which version/modification of a specific file should be eliminated.

**6.3.3 Cardinality:** Mandatory, one.

**6.3.4 Algorithm:** SHA1 (<http://tools.ietf.org/html/rfc3174>) is to be used on the file.

**6.3.5 Data Format:** There are two components, an algorithm identifier (SHA-1), a separator (":") and a 160 bit value represented as 40 hexadecimal digits.

**6.3.6 Tag:** "FileChecksum:"

**Example:**

FileChecksum: SHA1: d6a770ba38583ed4bb4525bd96e50461655d2758

**6.3.7 RDF: property** `spdx:Checksum` in **class** `spdx:File`**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <checksum>
    <Checksum>
      <algorithm>SHA1</algorithm>
      <checksumValue>d6a770ba38583ed4bb4525bd96e50461655d2758
    </checksumValue>
    </Checksum>
  </checksum>
</File>
```

**6.4 Concluded License**

**6.4.1 Purpose:** This field contains the license the SPDX file creator has concluded as governing the file or alternative values if the governing license cannot be determined. The options to populate this field are limited to:

- (a) the SPDX standardized license short form identifier, if the concluded license is on the SPDX License List;
- (b) a reference to the licenses, denoted by LicenseRef-#, if the concluded license is not on the SPDX License List;
- (c) NOASSERTION should be used if:
  - (i) the SPDX file creator has attempted to but cannot reach a reasonable objective determination of the concluded license;
  - (ii) the SPDX file creator is uncomfortable concluding a license, despite some license information being available;
  - (iii) the SPDX file creator has made no attempt to arrive at a concluded license;
  - (iv) the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so); or
  - (v) there is no license information from which to conclude a license for the file.

With respect to “a” and “b” above, if there is more than one concluded license, all should be included. If the package recipient has a choice of multiple licenses, then each of the choices should be recited as a “disjunctive” or “conjunctive” license, as appropriate. If the Concluded License is not the same as the License Information in File, a written explanation should be provided in the Comments on License field (section 6.6). With respect to (c), a written explanation in the Comments on License field is preferred.

**6.4.2 Intent:** Here, the intent is for the SPDX file creator to analyze the License Information in file (section 6.5) and other objective information, e.g., “COPYING FILE,” along with the results from any scanning tools, to arrive at a reasonably objective conclusion as to what license governs the file.

**6.4.3 Cardinality:** Mandatory, one.

**6.4.4 Data Format:** <short form identifier in Appendix I> | “LicenseRef”-N | “NOASSERTION” | “NONE” | <license set>

**6.4.5 Tag:** “LicenseConcluded:”

For a license set, when there is a choice between licenses (“disjunctive license”), they should be separated with “or” and enclosed in brackets. Similarly when multiple licenses need to be applied (“conjunctive license”), they should be separated with “and” and enclosed in parentheses.

**Example:**

LicenseConcluded: LGPL-2.0

**Example:**

LicenseConcluded: (LGPL-2.0 or LicenseRef-2)

**6.4.6 RDF: property** spdx:licenseConcluded in **class** spdx:File

**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <licenseConcluded> LGPL-2.0 </licenseConcluded>
</File>
```

**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <licenseConcluded>
    <ConjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0"/>
      <member rdf:resource="LicenseRef-2"/>
    </ConjunctiveLicenseSet>
  </licenseConcluded>
</File>
```

## 6.5 License Information in File

**6.5.1 Purpose:** This field contains the license information actually found in the file, if any. Any license information not actually in the file, e.g., "COPYING.txt" file in a toplevel directory, should not be reflected in this field. This information is most commonly found in the header of the file, although it may be in other areas of the actual file. The options to populate this field are limited to:

- (a) the SPDX License List short form identifier, if the license is on the SPDX License List;
- (b) a reference to the license, denoted by LicenseRef-#, if the license is not on the SPDX License List;
- (c) NONE, if the actual file contains no license information whatsoever; or
- (d) NOASSERTION, if the SPDX file creator has not examined the contents of the actual file or the SPDX file creator has intentionally provided no information (no meaning should be implied by doing so).

With respect to "a" and "b" above, if license information for more than one license is contained in the file or if the license information offers the package recipient a choice of licenses, then each of the choices should be listed as a separate entry.

**6.5.2 Intent:** Here, the intent is to provide the license information actually in the file, as compared to the Concluded License field.

**6.5.3 Cardinality:** Mandatory, one or many.

**6.5.4 Data Format:** <short form identifier in Appendix I> | "LicenseRef"-N | "NONE" | "NOASSERTION"

**6.5.5 Tag:** "LicenseInfoInFile:"

**Example:**

LicenseInfoInFile: GPL-2.0  
LicenseInfoInFile: LicenseRef-2

**6.5.6 RDF: property** `spdx:licenseInfoInFile` in **class** `spdx:File`

**Example:**

```
<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <licenseInfoInFile rdf:resource="http://spdx.org/licenses/GPL-2.0" />
  <licenseInfoInFile rdf:resource="LicenseRef-2" />
</File>
```

## 6.6 Comments on License

**6.6.1 Purpose:** This field provides a place for the SPDX file creator to record any relevant background references or analysis that went in to arriving at the Concluded License for a file. If the Concluded License does not match the License Information in File, this should be explained by the SPDX file creator. It is also preferable to include an explanation here when the Concluded License is NOASSERTION.

**6.6.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with a detailed explanation of how the Concluded License was determined if it does not match the License Information in File, is marked NOASSERTION, or other helpful information relevant to determining the license of the file.

**6.6.3 Cardinality:** Optional, one.

**6.6.4 Data Format:** free form text that can span multiple lines

- 6.6.5 Tag:** "LicenseComments:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

LicenseComments: <text>

The concluded license was taken from the package level that the file was included in.  
This information was found in the COPYING.txt file in the xyz directory.  
</text>

- 6.6.6 RDF: property** spdx:licenseComments in **class** spdx:File

**Example:**

<File:about="http://www.spdx.org/tools#SPDXANALYSIS?file">

<licenseComments>

The concluded license was taken from the package level that the file  
was included in. This information was found in the COPYING.txt file  
in the xyz directory. This package has been shipped in source and binary form.

</licenseComments>

</File>

## 6.7 Copyright Text

- 6.7.1 Purpose:** Identify the copyright holder of the file, as well as any dates present. This will be a freeform text field extracted from the actual file. The options to populate this field are limited to:

- (a) any text relating to a copyright notice, even if not complete;
- (b) NONE, if the file contains no license information whatsoever; or
- (c) NOASSERTION, if the SPDX creator has not examined the contents of the actual file or if the SPDX creator has intentionally provided no information (no meaning should be implied from the absence of an assertion).

- 6.7.2 Intent:** Record any copyright notice for the package.

- 6.7.3 Cardinality:** Mandatory, one.

- 6.7.4 Data Format:** free form text that can span multiple lines | "NONE" | "NOASSERTION"

- 6.7.5 Tag:** "FileCopyrightText:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

FileCopyrightText: <text> Copyright 2008-2010 John Smith </text>

- 6.7.6 RDF: property** spdx:copyrightText in **class** spdx:File

**Example:**

<File rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?file">

<copyrightText>

Copyright 2008-2010 John Smith

</copyrightText>

</File>

## 6.8 Artifact of Project Name

**6.8.1 Purpose:** To indicate that a file has been derived from a specific project.

**6.8.2 Intent:** To make it easier for recipients of the SPDX file to determine the original source of the identified file.

**6.8.3 Cardinality:** Optional, one.

**6.8.4 Data Format:** single line of text

**6.8.5 Tag:** "ArtifactOfProjectName:"

**Example:**

ArtifactOfProjectName: Jena

**6.8.6 RDF:** property `spdx:artifactOf/doap:Project/doap:name`

**Example:**

```
<File>
  <artifactOf>
    <doap:Project>
      <doap:name>Jena</doap:name>
    </doap:Project>
  </artifactOf>
</File>
```

## 6.9 Artifact of Project Homepage

**6.9.1 Purpose:** To indicate the location of the project from which the file has been derived.

**6.9.2 Intent:** To make it easier for consumers of the report to determine the original source of the file.

**6.9.3 Cardinality:** Optional, one.

**6.9.4 Data Format:** uniform resource locator | "UNKNOWN"

**6.9.5 Tag:** "ArtifactOfProjectHomePage:"

**Example:**

ArtifactOfProjectHomePage: <http://www.openjena.org/>

**6.9.6 RDF:** `spdx:artifactOf/doap:Project/doap:homepage`

**Example:**

```
<File>
  <artifactOf>
    <doap:Project>
      <doap:homepage rdf:resource="http://www.openjena.org/" />
    </doap:Project>
  </artifactOf>
</File>
```



## 6.10 Artifact of Project Uniform Resource Identifier

**6.10.1 Purpose:** To provide a linkage to the project resource in the doap document and permit interoperability between the different formats supported.

**6.10.2 Intent:** To make it easier for consumers of the report to determine the original source of the file.

**6.10.3 Cardinality:** Optional, one.

**6.10.4 Data Format:** uniform resource identifier

**6.10.5 Tag:** "ArtifactOfProjectURI:"

**Example:**

**ArtifactOfProjectURI:** <http://svn.apache.org/repos/asf/httpd/site/trunk/docs/doap.rdf>

**6.10.6 RDF:** spdx:artifactOf/doap

**Example:**

```
<File>
  <artifactOf
    rdf:resoure="http://svn.apache.org/repos/asf/httpd/site/trunk/docs/doap.rdf" />
</File>
```

## 6.11 File Comment

**6.11.1 Purpose:** This field provides a place for the SPDX file creator to record any general comments about the file.

**6.11.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with more information determined after careful analysis of a file.

**6.11.3 Cardinality:** Optional, one.

**6.11.4 Data Format:** free form text that can span multiple lines

**6.11.5 Tag:** "FileComment:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

```
FileComment: <text>
The concluded license was taken from the package level that the file was included in.
This information was found in the COPYING.txt file in the xyz directory.
</text>
```

**6.11.6 RDF: property** rdfs:comments in **class** spdx:File

**Example:**

```
<File:about="http://www.spdx.org/tools#SPDXANALYSIS?file">
  <rdfs:comment>
    The concluded license was taken from the package level that the file
    was included in. This information was found in the COPYING.txt file
    in the xyz directory. This package has been shipped in source and binary form.
  </rdfs:comment>
</File>
```

## 7 Review Information

Review information can be added after the initial SPDX file has been created. The set of fields are optional and multiple instances can be added. Once a Reviewer entry is added, the Review Date associated with the review is mandatory. The Created date should not be modified as a result of the addition of information regarding the conduct of a review. A Review Comments is optional.

Fields:

### 7.1 Reviewer

**7.1.1 Purpose:** This field identifies the person, organization or tool that has reviewed the SPDX file. This field is optional and thus there is no requirement for any reviewer to add a set of review information to the file. This can be considered as an equivalent to “signed off” or “reviewed by.” Additional reviewers can be added after the original version of the SPDX file is created and be appended to the original file.

**7.1.2 Intent:** Here, as time progresses certain reviewers will begin to gain credibility as reliable. This field intends to make such information transparent. It may also be important for participants in the software supply chain to validate whether upstream providers have reviewed the SPDX file.

**7.1.3 Cardinality:** Optional, one.

**7.1.4 Data Format:** single line of text with the following keywords.

“Person: person name” and optional “(email)”

“Organization: organization” and optional “(email)”

“Tool: tool identifier - version”

**7.1.5 Tag:** “Reviewer:”

**Example:**

Reviewer: Person: Jane Doe ([jane.doe@example.com](mailto:jane.doe@example.com))

**7.1.6 RDF: property** spdx:reviewer in **class** spdx:Review

**Example:**

<Review>

<reviewer> Person: Jane Doe ([jane@example.com](mailto:jane@example.com)) </reviewer>

</Review>

### 7.2 Review Date

**7.2.1 Purpose:** Identify when the review was done. This is to be specified according to the combined date and time in the UTC format, as specified in the ISO 8601 standard.

**7.2.2 Intent:** Here, the ReviewDate can serve as a verification as to when the actual review was done.

**7.2.3 Cardinality:** Conditional (Mandatory, one), if there is a Reviewer.

**7.2.4 Data Format:** YYYY-MM-DDThh:mm:ssZ

where:

YYYY is year

MM is month with leading zero

DD is day with leading zero

Official SPDX® Specification 1.1.

Copyright © 2010-2012 Linux Foundation and its Contributors.

Licensed under the Creative Commons Attribution License 3.0 Unported.

All other rights are expressly reserved.

**T** is delimiter for time  
**hh** is hours with leading zero in 24 hour time  
**mm** is minutes with leading zero  
**ss** is seconds with leading zero  
**Z** is universal time indicator

**7.2.5 Tag:** "ReviewDate:"

**Example:**

ReviewDate: 2010-01-29T18:30:22Z

**7.2.6 RDF: property** spdx:reviewDate **in class** spdx:Review

**Example:**

```
<Review>
  <reviewDate> 2010-01-29T18:30:22Z </reviewDate>
</Review>
```

### 7.3 Review Comment

**7.3.1 Purpose:** This optional free form text field permits the reviewer to provide commentary on the analysis.

**7.3.2 Intent:** This allows the reviewer to provide independent assessment and note any points where there is disagreement with the analysis.

**7.3.3 Cardinality:** Optional, one.

**7.3.4 Data Format:** free form text that can span multiple lines.

**7.3.5 Tag:** "ReviewComment:"  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

```
ReviewComment: <text>
All of the licenses seen in the file, are matching what was seen during manual
inspection. There are some terms that can influence the concluded license, and some
alternatives may be possible, but the concluded license is one of the options.
</text>
```

**7.3.6 RDF: property** rdfs:comment **in class** spdx:Review

**Example:**

```
<Review>
  <rdfs:comment>
    All of the licenses seen in the file, are matching what was seen during manual
    inspection. There are some terms that can influence the concluded license, and
    some alternatives may be possible, but the concluded license is one of the options.
  </rdfs:comment>
</Review>
```

## Appendix I. Standard License List

The SPDX License List is a list of commonly found open source software licenses for the purposes of being able to easily and efficiently identify such licenses in an SPDX document. The SPDX License List includes a standardized short identifier, full name for each license, vetted license text, other basic information, and a canonical permanent URL. By providing a short identifier, users can efficiently refer to a license without having to redundantly reproduce the full license.

The following table contains the full names and short identifiers for the SPDX License List, v1.16, which was released on June 20 2012. For the full and most up-to-date version of the SPDX License List, please see <http://spdx.org/licenses>

You may propose additional licenses be added to the SPDX License List by following the process at:

<http://spdx.org/wiki/spdx-license-list-process-requesting-new-licenses-be-added>

Guidelines for what constitutes a license match to the SPDX License List when generating an SPDX file can be found here:

<http://spdx.org/wiki/spdx-license-list-match-guidelines>

Exact match, of the formal license is expected unless indicated otherwise on the SPDX.org web site.

License Identifier	Full name of License
AFL-1.1	<a href="#">Academic Free License v1.1</a>
AFL-1.2	<a href="#">Academic Free License v1.2</a>
AFL-2.0	<a href="#">Academic Free License v2.0</a>
AFL-2.1	<a href="#">Academic Free License v2.1</a>
AFL-3.0	<a href="#">Academic Free License v3.0</a>
APL-1.0	<a href="#">Adaptive Public License 1.0</a>
ANTLR-PD	<a href="#">ANTLR Software Rights Notice</a>
Apache-1.0	<a href="#">Apache License 1.0</a>
Apache-1.1	<a href="#">Apache License 1.1</a>
Apache-2.0	<a href="#">Apache License 2.0</a>
APSL-1.0	<a href="#">Apple Public Source License 1.0</a>
APSL-1.1	<a href="#">Apple Public Source License 1.1</a>
APSL-1.2	<a href="#">Apple Public Source License 1.2</a>
APSL-2.0	<a href="#">Apple Public Source License 2.0</a>
Artistic-1.0	<a href="#">Artistic License 1.0</a>
Artistic-2.0	<a href="#">Artistic License 2.0</a>
AAL	<a href="#">Attribution Assurance License</a>
BSL-1.0	<a href="#">Boost Software License 1.0</a>
BSD-2-Clause	<a href="#">BSD 2-clause "Simplified" License</a>
BSD-2-Clause-NetBSD	<a href="#">BSD 2-clause "NetBSD" License</a>
BSD-2-Clause-FreeBSD	<a href="#">BSD 2-clause "FreeBSD" License</a>
BSD-3-Clause	<a href="#">BSD 3-clause "New" or "Revised" License</a>
BSD-4-Clause	<a href="#">BSD 4-clause "Original" or "Old" License</a>
BSD-4-Clause-UC	<a href="#">BSD-4-Clause (University of California-Specific)</a>

CECILL-1.0	<a href="#">CeCILL Free Software License Agreement v1.0</a>
CECILL-1.1	<a href="#">CeCILL Free Software License Agreement v1.1</a>
CECILL-2.0	<a href="#">CeCILL Free Software License Agreement v2.0</a>
CECILL-B	<a href="#">CeCILL-B Free Software License Agreement</a>
CECILL-C	<a href="#">CeCILL-C Free Software License Agreement</a>
ClArtistic	<a href="#">Clarified Artistic License</a>
CNRI-Python-GPL-Compatible	<a href="#">CNRI Python Open Source GPL Compatible License Agreement</a>
CNRI-Python	<a href="#">CNRI Python License</a>
CDDL-1.0	<a href="#">Common Development and Distribution License 1.0</a>
CDDL-1.1	<a href="#">Common Development and Distribution License 1.1</a>
CPAL-1.0	<a href="#">Common Public Attribution License 1.0</a>
CPL-1.0	<a href="#">Common Public License 1.0</a>
CATOSL-1.1	<a href="#">Computer Associates Trusted Open Source License 1.1</a>
CC-BY-1.0	<a href="#">Creative Commons Attribution 1.0</a>
CC-BY-2.0	<a href="#">Creative Commons Attribution 2.0</a>
CC-BY-2.5	<a href="#">Creative Commons Attribution 2.5</a>
CC-BY-3.0	<a href="#">Creative Commons Attribution 3.0</a>
CC-BY-ND-1.0	<a href="#">Creative Commons Attribution No Derivatives 1.0</a>
CC-BY-ND-2.0	<a href="#">Creative Commons Attribution No Derivatives 2.0</a>
CC-BY-ND-2.5	<a href="#">Creative Commons Attribution No Derivatives 2.5</a>
CC-BY-ND-3.0	<a href="#">Creative Commons Attribution No Derivatives 3.0</a>
CC-BY-NC-1.0	<a href="#">Creative Commons Attribution Non Commercial 1.0</a>
CC-BY-NC-2.0	<a href="#">Creative Commons Attribution Non Commercial 2.0</a>
CC-BY-NC-2.5	<a href="#">Creative Commons Attribution Non Commercial 2.5</a>
CC-BY-NC-3.0	<a href="#">Creative Commons Attribution Non Commercial 3.0</a>
CC-BY-NC-ND-1.0	<a href="#">Creative Commons Attribution Non Commercial No Derivatives 1.0</a>
CC-BY-NC-ND-2.0	<a href="#">Creative Commons Attribution Non Commercial No Derivatives 2.0</a>
CC-BY-NC-ND-2.5	<a href="#">Creative Commons Attribution Non Commercial No Derivatives 2.5</a>
CC-BY-NC-ND-3.0	<a href="#">Creative Commons Attribution Non Commercial No Derivatives 3.0</a>
CC-BY-NC-SA-1.0	<a href="#">Creative Commons Attribution Non Commercial Share Alike 1.0</a>
CC-BY-NC-SA-2.0	<a href="#">Creative Commons Attribution Non Commercial Share Alike 2.0</a>
CC-BY-NC-SA-2.5	<a href="#">Creative Commons Attribution Non Commercial Share Alike 2.5</a>
CC-BY-NC-SA-3.0	<a href="#">Creative Commons Attribution Non Commercial Share Alike 3.0</a>
CC-BY-SA-1.0	<a href="#">Creative Commons Attribution Share Alike 1.0</a>
CC-BY-SA-2.0	<a href="#">Creative Commons Attribution Share Alike 2.0</a>
CC-BY-SA-2.5	<a href="#">Creative Commons Attribution Share Alike 2.5</a>
CC-BY-SA-3.0	<a href="#">Creative Commons Attribution Share Alike 3.0</a>
CC0-1.0	<a href="#">Creative Commons Zero v1.0 Universal</a>
CUA-OPL-1.0	<a href="#">CUA Office Public License v1.0</a>
EPL-1.0	<a href="#">Eclipse Public License 1.0</a>
eCos-2.0	<a href="#">eCos license version 2.0</a>
ECL-1.0	<a href="#">Educational Community License v1.0</a>
ECL-2.0	<a href="#">Educational Community License v2.0</a>
EFL-1.0	<a href="#">Eiffel Forum License v1.0</a>
EFL-2.0	<a href="#">Eiffel Forum License v2.0</a>
Entessa	<a href="#">Entessa Public License</a>
ErlPL-1.1	<a href="#">Erlang Public License v1.1</a>

EUDatagrid	<a href="#">EU DataGrid Software License</a>
EUPL-1.0	<a href="#">European Union Public License 1.0</a>
EUPL-1.1	<a href="#">European Union Public License 1.1</a>
Fair	<a href="#">Fair License</a>
Frameworkx-1.0	<a href="#">Frameworkx Open License 1.0</a>
AGPL-3.0	<a href="#">GNU Affero General Public License v3</a>
GFDL-1.1	<a href="#">GNU Free Documentation License v1.1</a>
GFDL-1.2	<a href="#">GNU Free Documentation License v1.2</a>
GFDL-1.3	<a href="#">GNU Free Documentation License v1.3</a>
GPL-1.0	<a href="#">GNU General Public License v1.0 only</a>
GPL-1.0+	<a href="#">GNU General Public License v1.0 or later</a>
GPL-2.0	<a href="#">GNU General Public License v2.0 only</a>
GPL-2.0+	<a href="#">GNU General Public License v2.0 or later</a>
GPL-2.0-with-autoconf-exception	<a href="#">GNU General Public License v2.0 w/Autoconf exception</a>
GPL-2.0-with-bison-exception	<a href="#">GNU General Public License v2.0 w/Bison exception</a>
GPL-2.0-with-classpath-exception	<a href="#">GNU General Public License v2.0 w/Classpath exception</a>
GPL-2.0-with-font-exception	<a href="#">GNU General Public License v2.0 w/Font exception</a>
GPL-2.0-with-GCC-exception	<a href="#">GNU General Public License v2.0 w/GCC Runtime Library exception</a>
GPL-3.0	<a href="#">GNU General Public License v3.0 only</a>
GPL-3.0+	<a href="#">GNU General Public License v3.0 or later</a>
GPL-3.0-with-autoconf-exception	<a href="#">GNU General Public License v3.0 w/Autoconf exception</a>
GPL-3.0-with-GCC-exception	<a href="#">GNU General Public License v3.0 w/GCC Runtime Library exception</a>
LGPL-2.1	<a href="#">GNU Lesser General Public License v2.1 only</a>
LGPL-2.1+	<a href="#">GNU Lesser General Public License v2.1 or later</a>
LGPL-3.0	<a href="#">GNU Lesser General Public License v3.0 only</a>
LGPL-3.0+	<a href="#">GNU Lesser General Public License v3.0 or later</a>
LGPL-2.0	<a href="#">GNU Library General Public License v2 only</a>
LGPL-2.0+	<a href="#">GNU Library General Public License v2 or later</a>
gSOAP-1.3b	<a href="#">gSOAP Public License v1.b</a>
HPND	<a href="#">Historic Permission Notice and Disclaimer</a>
IPL-1.0	<a href="#">IBM Public License v1.0</a>
IPA	<a href="#">IPA Font License</a>
ISC	<a href="#">ISC License (Bind, DHCP Server)</a>
LPPL-1.0	<a href="#">LaTeX Project Public License v1.0</a>
LPPL-1.1	<a href="#">LaTeX Project Public License v1.1</a>
LPPL-1.2	<a href="#">LaTeX Project Public License v1.2</a>
LPPL-1.3c	<a href="#">LaTeX Project Public License v1.3c</a>
Libpng	<a href="#">libpng License</a>
LPL-1.0	<a href="#">Lucent Public License Version 1.0 (Plan9)</a>
LPL-1.02	<a href="#">Lucent Public License v1.02</a>
MS-PL	<a href="#">Microsoft Public License</a>
MS-RL	<a href="#">Microsoft Reciprocal License</a>
MirOS	<a href="#">MirOS Licence</a>
MIT	<a href="#">MIT license</a>
Motosoto	<a href="#">Motosoto License</a>

MPL-1.0	<a href="#">Mozilla Public License 1.0</a>
MPL-1.1	<a href="#">Mozilla Public License 1.1</a>
MPL-2.0	<a href="#">Mozilla Public License 2.0</a>
MPL-2.0-no-copyleft-exception	<a href="#">Mozilla Public License 2.0 (no copyleft)</a>
Multics	<a href="#">Multics License</a>
NASA-1.3	<a href="#">NASA Open Source Agreement 1.3</a>
Nauman	<a href="#">Naumen Public License</a>
NGPL	<a href="#">Nethack General Public License</a>
Nokia	<a href="#">Nokia Open Source License</a>
NPOSL-3.0	<a href="#">Non-Profit Open Software License 3.0</a>
NTP	<a href="#">NTP License</a>
OCLC-2.0	<a href="#">OCLC Research Public License 2.0</a>
ODbL-1.0	<a href="#">ODC Open Database License v1.0</a>
PDDL-1.0	<a href="#">ODC Public Domain Dedication &amp; License 1.0</a>
OGTSL	<a href="#">Open Group Test Suite License</a>
OSL-1.0	<a href="#">Open Software License 1.0</a>
OSL-2.0	<a href="#">Open Software License 2.0</a>
OSL-2.1	<a href="#">Open Software License 2.1</a>
OSL-3.0	<a href="#">Open Software License 3.0</a>
OLDAP-2.8	<a href="#">OpenLDAP Public License v2.8</a>
OpenSSL	<a href="#">OpenSSL License</a>
PHP-3.0	<a href="#">PHP License v3.0</a>
PHP-3.01	<a href="#">PHP License v3.01</a>
PostgreSQL	<a href="#">PostgreSQL License</a>
Python-2.0	<a href="#">Python License 2.0</a>
QPL-1.0	<a href="#">Q Public License 1.0</a>
RPSL-1.0	<a href="#">RealNetworks Public Source License v1.0</a>
RPL-1.5	<a href="#">Reciprocal Public License 1.5</a>
RHeCos-1.1	<a href="#">Red Hat eCos Public License v1.1</a>
RSCPL	<a href="#">Ricoh Source Code Public License</a>
Ruby	<a href="#">Ruby License</a>
SAX-PD	<a href="#">Sax Public Domain Notice</a>
OFL-1.0	<a href="#">SIL Open Font License 1.0</a>
OFL-1.1	<a href="#">SIL Open Font License 1.1</a>
SimPL-2.0	<a href="#">Simple Public License 2.0</a>
Sleepycat	<a href="#">Sleepycat License</a>
SugarCRM-1.1.3	<a href="#">SugarCRM Public License v1.1.3</a>
SPL-1.0	<a href="#">Sun Public License v1.0</a>
Watcom-1.0	<a href="#">Sybase Open Watcom Public License 1.0</a>
NCSA	<a href="#">University of Illinois/NCSA Open Source License</a>
VSL-1.0	<a href="#">Vovida Software License v1.0</a>
W3C	<a href="#">W3C Software and Notice License</a>
WXwindows	<a href="#">wxWindows Library License</a>
Xnet	<a href="#">X.Net License</a>
XFree86-1.1	<a href="#">XFree86 License 1.1</a>
YPL-1.0	<a href="#">Yahoo! Public License v1.0</a>
YPL-1.1	<a href="#">Yahoo! Public License v1.1</a>

Zimbra-1.3	<a href="#">Zimbra Public License v1.3</a>
Zlib	<a href="#">zlib License</a>
ZPL-1.1	<a href="#">Zope Public License 1.1</a>
ZPL-2.0	<a href="#">Zope Public License 2.0</a>
ZPL-2.1	<a href="#">Zope Public License 2.1</a>



## Appendix II. RDF Data Model Implementation

### SPDX® Vocabulary Specification

Version:

1.1 (Final)

Latest Version:

<http://spdx.org/rdf/terms>

Copyright © 2010-2012 Linux Foundation and its Contributors. All other rights are expressly reserved.

Licensed under the [Creative Commons Attribution License 3.0 unported](#).

### Introduction

This specification describes the SPDX® language, defined as a dictionary of named properties and classes using W3C's RDF Technology.

SPDX® is designed to allow the exchange of data about software packages. This information includes general information about the package, licensing information about the package as a whole, a manifest of files contained in the package and licensing information related to the contained files.

### About this document

This is an RDFa annotated HTML document that defines the SPDX® RDF vocabulary using the Web Ontology Language. It is RDFa 1.0 compatible and may be consumed by any RDFa 1.0 compatible parser. The same information is available in [RDF/XML](#) and [Turtle](#) formats if those are more convenient.

RDF is a widely used data interchange technology which allows heterogeneous systems communicate even when their internal models/implementations are incompatible. For more details on RDF, this [RDF primer](#) helpful for gaining a basic understanding.

### Prefixes used in this document

The `spdx` prefix used in this document expands to `http://spdx.org/rdf/terms#`. Any terms in this document without an explicit prefix may be assumed to be in the `spdx` namespace.

### Other vocabularies used by this one

In addition to the `spdx` prefix the following prefixes are also used. Each of these reference another vocabulary imported and used by the SPDX vocabulary.

- [DOAP](#)
- [RDFS](#)

## Classes

- [SpdxDocument](#)
- [CreationInfo](#)
- [Package](#)
- [ExtractedLicensingInfo](#)
- [Checksum](#)
- [PackageVerificationCode](#)
- [File](#)
- [Review](#)
- [License](#)
- [ConjunctiveLicenseSet](#)
- [DisjunctiveLicenseSet](#)
- [AnyLicenseInfo](#)
- [SimpleLicenseInfo](#)

### Class: SpdxDocument

An SpdxDocument is a summary of the contents, provenance, ownership and licensing analysis of a specific software package. This is, effectively, the top level of SPDX information.

Status:

stable

Properties:

- [specVersion](#) Cardinality: Mandatory, one
- [dataLicense](#) Cardinality: Mandatory, one
- [rdfs:comment](#) Cardinality: Optional, zero or one
- [creationInfo](#) Cardinality: Mandatory, one
- [describesPackage](#) Cardinality: Mandatory, one
- [hasExtractedLicensingInfo](#) Cardinality: Optional, zero or more
- [referencesFile](#) Cardinality: Mandatory, one or more
- [reviewed](#) Cardinality: Optional, zero or more.

**Class: CreationInfo**

A CreationInfo provides information about the individuals, organizations and tools involved in the creation of an [SpdxDocument](#).

Status:

stable

Properties:

- [creator](#) Cardinality: Mandatory, one or more
- [created](#) Cardinality: Mandatory, one
- [rdfs:comment](#) Cardinality: Optional, zero or one

**Class: Package**

A Package represents a collection of software files that are delivered as a single functional component.

Status:

stable

Properties:

- [name](#) Cardinality: Mandatory, one
- [versionInfo](#) Cardinality: Optional, zero or one
- [packageFileName](#) Cardinality: Optional, zero or one
- [supplier](#) Cardinality: Optional, zero or one
- [originator](#) Cardinality: Optional, zero or one
- [downloadLocation](#) Cardinality: Mandatory, one
- [packageVerificationCode](#) Cardinality: Mandatory, one
- [checksum](#) Cardinality: Optional, zero or one
- [sourceInfo](#) Cardinality: Optional, zero or one
- [licenseConcluded](#) Cardinality: Mandatory, one
- [licenseInfoFromFiles](#) Cardinality: Mandatory, one or more
- [licenseDeclared](#) Cardinality: Mandatory, one
- [licenseComments](#) Cardinality: Optional, zero or one

- [copyrightText](#) Cardinality: Mandatory, one
- [summary](#) Cardinality: Optional, zero or one
- [description](#) Cardinality: Optional, zero or one
- [hasFile](#) Cardinality: Mandatory, one or more

### Class: **ExtractedLicensingInfo**

An `ExtractedLicensingInfo` represents a license or licensing notice that was found in the package. Any license text that is recognized as a license may be represented as a [License](#) rather than an `ExtractedLicensingInfo`.

Status:

stable

Properties:

- [licenseId](#) Cardinality: Mandatory, one
- [name](#) Cardinality: Optional, zero or more
- [extractedText](#) Cardinality: Mandatory, one
- [rdfs:comment](#) Cardinality: Optional, zero or one
- [rdfs:seeAlso](#) Cardinality: Optional, zero or more

### Class: **File**

A `File` represents a named sequence of information that is contained in a software package.

Status:

stable

Properties:

- [fileName](#) Cardinality: Mandatory, one
- [rdfs:comment](#) Cardinality: Optional, zero or one
- [fileType](#) Cardinality: Optional, zero or one
- [checksum](#) Cardinality: Mandatory, one
- [licenseConcluded](#) Cardinality: Mandatory, one
- [licenseInfoInFile](#) Cardinality: Mandatory, one or more

- [licenseComments](#) Cardinality: Optional, zero or one
- [copyrightText](#) Cardinality: Mandatory, one
- [artifactOf](#) Cardinality: Optional, zero or one

### Class: Review

A Review represents an audit and signoff by an individual, organization or tool on the information in an [SpxDocument](#).

Status:

stable

Properties:

- [reviewer](#) Cardinality: Mandatory, one
- [reviewDate](#) Cardinality: Mandatory, one
- [rdfs:comment](#) Cardinality: Optional, zero or one

### Class: License

A License represents a copyright license. The [SPDX license list website](#) is annotated with these properties (using [RDFa](#)) to allow license data published there to be easily processed.

The license list is populated in accordance with the [License List fields guidelines](#). These guidelines are not normative and may change over time. SPDX tooling should not rely on values in the license list conforming to the current guidelines.

Status:

stable

Properties:

- [licenseId](#) Cardinality: Mandatory, one

A short human readable unique name for the license.

- [name](#) Cardinality: Optional, zero or one

A full name, including version if applicable, of the license.

- [licenseText](#) Cardinality: Mandatory, one

Full text of the license.

- [isOsiApproved](#) Cardinality: Mandatory, one

Indicates if the [OSI](#) has approved the license.

- [standardLicenseHeader](#) Cardinality: Optional, zero or one

License author's preferred text to indicate that a file is covered by the license.

- [rdfs:comment](#) Cardinality: Optional, zero or one

Factual notes regarding the license such as release date.

- [rdfs:seeAlso](#) Cardinality: Optional, zero or more

A link to the license on another website.

### Class: Checksum

A Checksum is a value that allows the contents of a file to be authenticated. Even small changes to the content of the file will change its checksum. This class allows the results of a variety of checksum and cryptographic message digest algorithms to be represented.

Status:

stable

Properties:

- [algorithm](#) Cardinality: Mandatory, one
- [checksumValue](#) Cardinality: Mandatory, one

### Class: PackageVerificationCode

A manifest based verification code (the algorithm is defined in section 4.7 of the full specification) of the package. This allows consumers of this data and/or database to determine if a package they have in hand is identical to the package from which the data was produced. This algorithm works even if the SPDX document is included in the package.

Status:

stable

Properties:

- [packageVerificationCodeExcludedFile](#) Cardinality: Optional, zero or more
- [packageVerificationCodeValue](#) Cardinality: Mandatory, one

### Class: ConjunctiveLicenseSet

A ConjunctiveLicenseSet represents a set of [licensing information](#) all of which apply.

This class refines [rdfs:Container](#).

Status:

stable

Properties:

- [member](#) Cardinality: Mandatory, two or more.

**Class: DisjunctiveLicenseSet**

A DisjunctiveLicenseSet represents a set of [licensing information](#) where only one license applies at a time. This class implies that the recipient gets to choose one of these licenses they would prefer to use.

This class refines [rdfs:Container](#).

Status:

stable

Properties:

- [member](#) Cardinality: Mandatory, two or more.

**Class: AnyLicenseInfo**

The AnyLicenseInfo class includes all resources that represent licensing information.

Status:

stable

Members

All resources in any of the following classes:

- [License](#)
- [ExtractedLicensingInfo](#)
- [ConjunctiveLicenseSet](#)
- [DisjunctiveLicenseSet](#)

**Class: SimpleLicenseInfo**

The SimpleLicenseInfo class includes all resources that represent simple, atomic, licensing information.

Status:

stable

Members

All resources in any of the following classes:

- [License](#)
- [ExtractedLicensingInfo](#)

**Properties**

- [algorithm](#)
- [artifactOf](#)
- [checksum](#)
- [checksumValue](#)
- [copyrightText](#)
- [created](#)
- [creationInfo](#)
- [creator](#)
- [dataLicense](#)
- [describesPackage](#)

- [description](#)
- [downloadLocation](#)
- [extractedText](#)
- [fileName](#)
- [fileType](#)
- [hasExtractedLicensingInfo](#)
- [hasFile](#)
- [isOsiApproved](#)
- [licenseComments](#)
- [licenseConcluded](#)
- [licenseDeclared](#)
- [licenseId](#)
- [licenseText](#)
- [licenseInfoFromFiles](#)
- [licenseInfoInFile](#)
- [member](#)
- [name](#)
- [originator](#)
- [packageFileName](#)
- [packageVerificationCode](#)
- [packageVerificationCodeExcludedFile](#)
- [packageVerificationCodeValue](#)
- [referencesFile](#)
- [reviewDate](#)
- [reviewed](#)
- [reviewer](#)
- [sourceInfo](#)
- [specVersion](#)
- [standardLicenseHeader](#)
- [summary](#)
- [supplier](#)
- [versionInfo](#)

**Property: algorithm**

Identifies the algorithm used to produce the subject [Checksum](#). Currently, [SHA-1](#) is the only supported algorithm. It is anticipated that other algorithms will be supported at a later time.

Status:

stable

Domain:

[Checksum](#)

Range:

[spdx:checksumAlgorithm\\_sha1](#)



**Property: artifactOf**

Indicates the project in which the file originated.

Tools must preserve doap:homepage and doap:name properties and the URI (if one is known) of doap:Project resources that are values of this property. All other properties of doap:Projects are not directly supported by SPDX and may be dropped when translating to or from some SPDX formats.

Status:

stable

Domain:

[File](#)

Range:

[doap:Project](#)

**Property: checksum**

The checksum property provides a mechanism that can be used to verify that the contents of a [File](#) or [Package](#) have not changed.

Status:

stable

Domain:

Any of:

- [Package](#)
- [File](#)

Range:

[Checksum](#)

**Property: checksumValue**

The checksumValue property provides a lower case hexadecimal encoded digest value produced using a specific algorithm.

Status:

stable

Domain:

[Checksum](#)

Range:

[xsd:hexBinary](#)

**Property: created**

The date and time at which the [SpdxDocument](#) was created. This value must in UTC and have 'Z' as its timezone indicator.

Status:

stable

Domain:

[CreationInfo](#)

Range:

[xsd:dateTime](#)

**Property: copyrightText**

The text of copyright declarations recited in the [Package](#) or [File](#).

Status:

stable

Domain:

Any of:

- [Package](#)
- [File](#)

Range:

Any of:

- [rdfs:Literal](#)
- [spdx:none](#)
- [spdx:noassertion](#)

**Property: creationInfo**

The `creationInfo` property relates an [SpdxDocument](#) to a set of information about the creation of the [SpdxDocument](#).

Status:

stable

Domain:

[SpdxDocument](#)

Range:

[CreationInfo](#)

**Property: creator**

The name and, optionally, contact information of a person, organization or tool that created, or was used to create, the [SpdxDocument](#).

Values of this property must conform to the [agent and tool syntax](#).

Status:

stable

Domain:

[CreationInfo](#)

Range:

[xsd:string](#)

**Property: dataLicense**

The licensing under which the [creator](#) of this SPDX document allows related data to be reproduced.

The only valid value for this property is <http://spdx.org/licenses/CC0-1.0>. This is to alleviate any concern that content (the data) in an SPDX file is subject to any form of intellectual property right that could restrict the re-use of the information or the creation of another SPDX file for the same project(s). This approach avoids intellectual property and related restrictions over the SPDX file, however individuals can still contract one to one to restrict release of specific collections of SPDX files (which map to software bill of materials) and the

identification of the supplier of SPDX files.

Status:

stable

Domain:

[SpdxDocument](#)

Range:

<http://spdx.org/licenses/CC0-1.0>

### Property: **describesPackage**

The describesPackage property relates an SpdxDocument to the package which it describes.

Status:

stable

Domain:

[SpdxDocument](#)

Range:

[Package](#)

### Property: **description**

Provides a detailed description of the package.

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#)

### Property: **downloadLocation**

The URI at which this package is available for download. Private (i.e., not publicly reachable) URIs are acceptable as values of this property.

The values <http://spdx.org/rdf/terms#none> and <http://spdx.org/rdf/terms#noassertion> may be used to specify that the package is not downloadable or that no attempt was made to determine its download location, respectively.

Status:

stable

Domain:

[Package](#)

Range:

[xsd:anyURI](#)

### Property: **extractedText**

Verbatim license or licensing notice text that was discovered.

Status:

stable

Domain:

[ExtractedLicensingInfo](#)

Range:

[xsd:string](#)

**Property: fileName**

The name of the file relative to the root of the package.

Status:

stable

Domain:

[File](#)

Range:

[xsd:string](#)

**Property: fileType**

The type of the file.

Status:

stable

Domain:

[File](#)

Range:

One of:

- [spdx:fileType\\_source](#)

Indicates the file is a source code file.

- [spdx:fileType\\_archive](#)

Indicates the file is an archive file.

- [spdx:fileType\\_binary](#)

Indicates the file is not a text file. `fileType_archive` is preferred for archive files even though they are binary.

- [spdx:fileType\\_other](#)

Indicates the file did not fall into any of the other categories.

**Property: hasExtractedLicensingInfo**

Indicates that a particular [ExtractedLicensingInfo](#) was defined in the subject [SpdxDocument](#).

Status:

stable

Domain:

[SpdxDocument](#)

Range:

[ExtractedLicensingInfo](#)

### Property: **hasFile**

Indicates that a particular [file](#) belongs to a [package](#).

Status:

stable

Domain:

[Package](#)

Range:

[File](#)

### Property: **isOsiApproved**

Indicates that a particular [license](#) has been approved by the [OSI](#) as an open source licenses. If this property is true there *should* be a *seeAlso* property linking to the OSI version of the license.

Status:

stable

Domain:

[License](#)

Range:

[xsd:boolean](#)

### Property: **licenseComments**

The `licenseComments` property allows the preparer of the SPDX document to describe why the licensing in [spdx:licenseConcluded](#) was chosen.

Status:

stable

Domain:

Any of:

- [Package](#)
- [File](#)

Range:

[xsd:string](#)

### Property: **licenseConcluded**

The licensing that the preparer of this SPDX document has concluded, based on the evidence, actually applies to the package.

Status:

stable

Domain:

Any of:

- [Package](#)

- [File](#)

Range:

Any of:

- [AnyLicenseInfo](#)
- [spdx:none](#)
- [spdx:noassertion](#)

### Property: **licenseDeclared**

The licensing that the creators of the software in the package, or the packager, have declared. Declarations by the original software creator should be preferred, if they exist.

Status:

stable

Domain:

[Package](#)

Range:

Any of:

- [AnyLicenseInfo](#)
- [spdx:none](#)
- [spdx:noassertion](#)

### Property: **licenseId**

A short name for the license that is at least 3 characters long and made up of the characters from the set 'a'-'z', 'A'-'Z', '0'-'9', '+', '\_', '.', and '-'. Formally, all `licenseId` values must match the regular expression: `[-+_.a-zA-Z0-9]{3,}`

Status:

stable

Domain:

- [License](#)
- [ExtractedLicensingInfo](#)

Range:

[xsd:string](#)

### Property: **licenseText**

The full text of the license.

Status:

stable

Domain:

[License](#)

Range:

[xsd:string](#)

**Property: `licenseInfoFromFiles`**

The licensing information that was discovered directly within the package. There will be an instance of this property for each distinct value of all [licenseInfoInFile](#) properties of all files contained in the package.

Status:

stable

Domain:

[Package](#)

Range:

Any of:

- [SimpleLicenseInfo](#)
- [spdx:none](#)
- [spdx:noassertion](#)

**Property: `licenseInfoInFile`**

Licensing information that was discovered directly in the subject file.

Status:

stable

Domain:

[File](#)

Range:

Any of:

- [SimpleLicenseInfo](#)
- [spdx:none](#)
- [spdx:noassertion](#)

**Property: `member`**

A [license](#), or other licensing information, that is a member of the subject license set.

Status:

stable

Domain:

Any of:

- [ConjunctiveLicenseSet](#)
- [DisjunctiveLicenseSet](#)

Range:

[AnyLicenseInfo](#)

Refines:

[rdfs:member](#)

**Property: `name`**

The full human readable name of the item. This should include version information when applicable.

Status:

stable

Domain:

Any of:

- [Package](#)
- [ExtractedLicensingInfo](#)
- [License](#)

Range:

[xsd:string](#)

Refines:

[rdfs:label](#)

#### Property: **originator**

The name and, optionally, contact information of the person or organization that originally created the package.

Values of this property must conform to the [agent and tool syntax](#).

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#) or the individual [spdx:noassertion](#)

#### Property: **packageFileName**

The base name of the package file name. For example, `zlib-1.2.5.tar.gz`.

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#)

#### Property: **packageVerificationCode**

A manifest based authentication code for the package. This allows consumers of this data to determine if a package they have in hand is identical to the package from which the data was produced. This algorithm works even if the SPDX document is included in the package. This algorithm is described in detail in the SPDX specification.

The package verification code algorithm is defined in section 4.7 of the full specification.

Status:

stable

Domain:

[Package](#)

Range:

[PackageVerificationCode](#)



**Property: packageVerificationCodeExcludedFile**

A file that was excluded when calculating the [package verification code](#). This is usually a file containing SPDX data regarding the package. If a package contains more than one SPDX file all SPDX files must be excluded from the package verification code. If this is not done it would be impossible to correctly calculate the verification codes in both files.

Status:

stable

Domain:

[PackageVerificationCode](#)

Range:

[xsd:string](#)

**Property: packageVerificationCodeValue**

The actual package verification code as a hex encoded value.

Status:

stable

Domain:

[PackageVerificationCode](#)

Range:

[xsd:hexBinary](#)

**Property: referencesFile**

Indicates that a particular file belongs as part of the set of analyzed files in the [SpdxDocument](#).

Status:

stable

Domain:

[SpdxDocument](#)

Range:

[File](#)

**Property: reviewDate**

The date and time at which the [SpdxDocument](#) was reviewed. This value must be in UTC and have 'Z' as its timezone indicator.

Status:

stable

Domain:

[Review](#)

Range:

[xsd:dateTime](#)

**Property: reviewed**

The review property relates a [SpdxDocument](#) to the review history.

Status:  
stable  
Domain:  
[SpdxDocument](#)  
Range:  
[Review](#)

**Property: reviewer**

The name and, optionally, contact information of the person who performed the review.

Values of this property must conform to the [agent and tool syntax](#).

Status:  
stable  
Domain:  
[Review](#)  
Range:  
[xsd:string](#)

**Property: sourceInfo**

Allows the producer(s) of the SPDX document to describe how the package was acquired and/or changed from the original source.

Status:  
stable  
Domain:  
[Package](#)  
Range:  
[xsd:string](#)

**Property: specVersion**

Identifies the version of this specification that was used to produce this SPDX document. The value for this version of the spec is SPDX-1.1. The value SPDX-1.0 may also be supported by SPDX tools for backwards compatibility purposes.

Status:  
stable  
Domain:  
[SpdxDocument](#)  
Range:  
[xsd:string](#)

**Property: standardLicenseHeader**

Text specifically delineated by the license, or license appendix, as the preferred way to indicate that a source, or other, file is copyable under the license.

Status:  
stable

Domain:

[License](#)

Range:

[xsd:string](#)

### Property: summary

Provides a short description of the package.

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#)

### Property: supplier

The name and, optionally, contact information of the person or organization who was the immediate supplier of this package to the recipient. The supplier may be different than [originator](#) when the software has been repackaged. Values of this property must conform to the [agent and tool syntax](#).

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#) or the individual [spdx:noassertion](#)

### Property: versionInfo

Provides an indication of the version of the package that is described by this [SpxDocument](#).

Status:

stable

Domain:

[Package](#)

Range:

[xsd:string](#)

### Individuals

- [checksumAlgorithm\\_sha1](#)
- [fileType\\_archive](#)
- [fileType\\_binary](#)
- [fileType\\_other](#)
- [fileType\\_source](#)
- [noassertion](#)
- [none](#)

**Individual: checksumAlgorithm\_sha1**

Indicates the algorithm used was [SHA-1](#)

Status:  
stable

**Individual: fileType\_archive**

Indicates the file is an archive file.

Status:  
stable

**Individual: fileType\_binary**

Indicates the file is not a text file. [spdx:filetype\\_archive](#) is preferred for archive files even though they are binary.

Status:  
stable

**Individual: fileType\_other**

Indicates the file is not a [source](#), [archive](#) or [binary](#) file.

Status:  
stable

**Individual: fileType\_source**

Indicates the file is a source code file.

Status:  
stable

**Individual: noassertion**

Indicates that the preparer of the SPDX document is not making any assertion regarding the value of this field.

Status:  
stable

**Individual: none**

When this value is used as the object of a property it indicates that the preparer of the [SpdxDocument](#) believes that there is no value for the property. This value should only be used if there is sufficient evidence to support this assertion.

Status:  
stable

## Agent and Tool Identifiers

Fields that identify entities that have acted in relation to the SPDX file are single line of text which name the agent or tool and, optionally, provide contact information. For example, "Person: Jane Doe (jane.doe@example.com)", "Organization: ExampleCodeInspect (contact@example.com)" and "Tool: LicenseFind - 1.0". The exact syntax of agent and tool identifications is described below in [ABNF](#).

```

agent                = person / organization

tool                 = "Tool: " name 0*1( " " DASH " " version)
person               = "Person: " name 0*1contact-info
organization         = "Organization: " name 0*1contact-info

name                 = 1*( UNRESERVED ) / U+0022 1*( VCHAR-SANS-QUOTE ) U+0022
contact-info         = " (" email-addr ")"
email-addr           = local-name-atom *( "." local-name-atom ) "@" domain-name-atom
1*( "." domain-name-atom )

version              = 1*VCHAR-SANS-QUOTE

local-name-atom      = 1*( ALPHA / DIGIT /           ; Printable US-ASCII
    "!" / "#" /           ; characters not including
    "$" / "%" /           ; specials.
    "&" / "'" /
    "*" / "+" /
    "-" / "/" /
    "=" / "?" /
    "^" / " " /
    "`" / "{" /
    "|" / "}" /
    "~" )

domain-name-atom     = 1*( ALPHA / DIGIT / "-" )

DASH                 = U+2010 / U+2212 /           ; hyphen, minus, em dash and
    U+2013 / U+2014       ; en dash

UNRESERVED           = U+0020-U+0027 /           ; visible unicode characters
    U+0029-U+0080 /       ; except '(' and dashes
    U+00A0-U+200F /
    U+2011-U+2027 /
    U+202A-U+2211 /
    U+2213-U+E01EF

VCHAR-SANS-QUOTE     = U+0020-U+0021 /           ; visible unicode characters
    U+0023-U+0080 /       ; except quotation mark
    U+00a0-U+E01EF

```

## Appendix III. Creative Commons Attribution License 3.0 Unported

### License

THE WORK (AS DEFINED BELOW) IS PROVIDED UNDER THE TERMS OF THIS CREATIVE COMMONS PUBLIC LICENSE ("CCPL" OR "LICENSE"). THE WORK IS PROTECTED BY COPYRIGHT AND/OR OTHER APPLICABLE LAW. ANY USE OF THE WORK OTHER THAN AS AUTHORIZED UNDER THIS LICENSE OR COPYRIGHT LAW IS PROHIBITED.

BY EXERCISING ANY RIGHTS TO THE WORK PROVIDED HERE, YOU ACCEPT AND AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE. TO THE EXTENT THIS LICENSE MAY BE CONSIDERED TO BE A CONTRACT, THE LICENSOR GRANTS YOU THE RIGHTS CONTAINED HERE IN CONSIDERATION OF YOUR ACCEPTANCE OF SUCH TERMS AND CONDITIONS.

### 1. Definitions

- a. **"Adaptation"** means a work based upon the Work, or upon the Work and other pre-existing works, such as a translation, adaptation, derivative work, arrangement of music or other alterations of a literary or artistic work, or phonogram or performance and includes cinematographic adaptations or any other form in which the Work may be recast, transformed, or adapted including in any form recognizably derived from the original, except that a work that constitutes a Collection will not be considered an Adaptation for the purpose of this License. For the avoidance of doubt, where the Work is a musical work, performance or phonogram, the synchronization of the Work in timed-relation with a moving image ("synching") will be considered an Adaptation for the purpose of this License.
- b. **"Collection"** means a collection of literary or artistic works, such as encyclopedias and anthologies, or performances, phonograms or broadcasts, or other works or subject matter other than works listed in Section 1(f) below, which, by reason of the selection and arrangement of their contents, constitute intellectual creations, in which the Work is included in its entirety in unmodified form along with one or more other contributions, each constituting separate and independent works in themselves, which together are assembled into a collective whole. A work that constitutes a Collection will not be considered an Adaptation (as defined above) for the purposes of this License.
- c. **"Distribute"** means to make available to the public the original and copies of the Work or Adaptation, as appropriate, through sale or other transfer of ownership.
- d. **"Licensor"** means the individual, individuals, entity or entities that offer(s) the Work under the terms of this License.
- e. **"Original Author"** means, in the case of a literary or artistic work, the individual, individuals, entity or entities who created the Work or if no individual or entity can be identified, the publisher; and in addition (i) in the case of a performance the actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret or otherwise perform literary or artistic works or expressions of folklore; (ii) in the case of a phonogram the producer being the person or legal entity who first fixes the sounds of a performance or other sounds; and, (iii) in the case of broadcasts, the organization that transmits the broadcast.
- f. **"Work"** means the literary and/or artistic work offered under the terms of this License including without limitation any production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression including digital form, such as a book, pamphlet and other writing; a lecture, address, sermon or other work of the same nature; a dramatic or dramatico-musical work; a choreographic work or entertainment in dumb show; a musical composition with or without words; a cinematographic work to which are assimilated works expressed by a process analogous to cinematography; a work of drawing, painting, architecture, sculpture, engraving or lithography; a photographic work to which are assimilated works expressed by a process analogous to photography; a work of applied art; an illustration, map, plan, sketch or three-dimensional work relative to geography, topography, architecture or science; a performance; a broadcast; a phonogram; a compilation of data to the extent it is protected as a copyrightable work; or a work performed by a variety or circus performer to the extent it is not otherwise considered a literary or artistic work.

Official SPDX® Specification 1.1.

Copyright © 2010-2012 Linux Foundation and its Contributors.

Licensed under the Creative Commons Attribution License 3.0 Unported.

All other rights are expressly reserved.

- g. **"You"** means an individual or entity exercising rights under this License who has not previously violated the terms of this License with respect to the Work, or who has received express permission from the Licensor to exercise rights under this License despite a previous violation.
- h. **"Publicly Perform"** means to perform public recitations of the Work and to communicate to the public those public recitations, by any means or process, including by wire or wireless means or public digital performances; to make available to the public Works in such a way that members of the public may access these Works from a place and at a place individually chosen by them; to perform the Work to the public by any means or process and the communication to the public of the performances of the Work, including by public digital performance; to broadcast and rebroadcast the Work by any means including signs, sounds or images.
- i. **"Reproduce"** means to make copies of the Work by any means including without limitation by sound or visual recordings and the right of fixation and reproducing fixations of the Work, including storage of a protected performance or phonogram in digital form or other electronic medium.

**2. Fair Dealing Rights.** Nothing in this License is intended to reduce, limit, or restrict any uses free from copyright or rights arising from limitations or exceptions that are provided for in connection with the copyright protection under copyright law or other applicable laws.

**3. License Grant.** Subject to the terms and conditions of this License, Licensor hereby grants You a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) license to exercise the rights in the Work as stated below:

- a. to Reproduce the Work, to incorporate the Work into one or more Collections, and to Reproduce the Work as incorporated in the Collections;
- b. to create and Reproduce Adaptations provided that any such Adaptation, including any translation in any medium, takes reasonable steps to clearly label, demarcate or otherwise identify that changes were made to the original Work. For example, a translation could be marked "The original work was translated from English to Spanish," or a modification could indicate "The original work has been modified.";
- c. to Distribute and Publicly Perform the Work including as incorporated in Collections; and,
- d. to Distribute and Publicly Perform Adaptations.
- e. For the avoidance of doubt:
  - i. **Non-waivable Compulsory License Schemes.** In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme cannot be waived, the Licensor reserves the exclusive right to collect such royalties for any exercise by You of the rights granted under this License;
  - ii. **Waivable Compulsory License Schemes.** In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme can be waived, the Licensor waives the exclusive right to collect such royalties for any exercise by You of the rights granted under this License; and,
  - iii. **Voluntary License Schemes.** The Licensor waives the right to collect royalties, whether individually or, in the event that the Licensor is a member of a collecting society that administers voluntary licensing schemes, via that society, from any exercise by You of the rights granted under this License.

The above rights may be exercised in all media and formats whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats. Subject to Section 8(f), all rights not expressly granted by Licensor are hereby reserved.

**4. Restrictions.** The license granted in Section 3 above is expressly made subject to and limited by the following restrictions:

- a. You may Distribute or Publicly Perform the Work only under the terms of this License. You must include a copy of, or the Uniform Resource Identifier (URI) for, this License with every copy of the Work You Distribute or Publicly Perform. You may not offer or impose any terms on the Work that restrict the terms of this License or the ability of the recipient of the Work to exercise the rights granted to that recipient under the terms of the License. You may not sublicense the Work. You must keep intact all notices that refer to this License and to the disclaimer of warranties with every copy of the Work You Distribute or Publicly Perform. When You Distribute or Publicly Perform the Work, You may not impose any effective technological measures on the Work that restrict the ability of a recipient of the Work from You to exercise the rights granted to that recipient under the terms of the License. This Section 4(a) applies to the Work as incorporated in a Collection, but this does not require the Collection apart from the Work itself to be made subject to the terms of this License. If You create a Collection, upon notice from any Licensor You must, to the extent practicable, remove from the Collection any credit as required by Section 4(b), as requested. If You create an Adaptation, upon notice from any Licensor You must, to the extent practicable, remove from the Adaptation any credit as required by Section 4(b), as requested.
- b. If You Distribute, or Publicly Perform the Work or any Adaptations or Collections, You must, unless a request has been made pursuant to Section 4(a), keep intact all copyright notices for the Work and provide, reasonable to the medium or means You are utilizing: (i) the name of the Original Author (or pseudonym, if applicable) if supplied, and/or if the Original Author and/or Licensor designate another party or parties (e.g., a sponsor institute, publishing entity, journal) for attribution ("Attribution Parties") in Licensor's copyright notice, terms of service or by other reasonable means, the name of such party or parties; (ii) the title of the Work if supplied; (iii) to the extent reasonably practicable, the URI, if any, that Licensor specifies to be associated with the Work, unless such URI does not refer to the copyright notice or licensing information for the Work; and (iv) , consistent with Section 3(b), in the case of an Adaptation, a credit identifying the use of the Work in the Adaptation (e.g., "French translation of the Work by Original Author," or "Screenplay based on original Work by Original Author"). The credit required by this Section 4 (b) may be implemented in any reasonable manner; provided, however, that in the case of a Adaptation or Collection, at a minimum such credit will appear, if a credit for all contributing authors of the Adaptation or Collection appears, then as part of these credits and in a manner at least as prominent as the credits for the other contributing authors. For the avoidance of doubt, You may only use the credit required by this Section for the purpose of attribution in the manner set out above and, by exercising Your rights under this License, You may not implicitly or explicitly assert or imply any connection with, sponsorship or endorsement by the Original Author, Licensor and/or Attribution Parties, as appropriate, of You or Your use of the Work, without the separate, express prior written permission of the Original Author, Licensor and/or Attribution Parties.
- c. Except as otherwise agreed in writing by the Licensor or as may be otherwise permitted by applicable law, if You Reproduce, Distribute or Publicly Perform the Work either by itself or as part of any Adaptations or Collections, You must not distort, mutilate, modify or take other derogatory action in relation to the Work which would be prejudicial to the Original Author's honor or reputation. Licensor agrees that in those jurisdictions (e.g. Japan), in which any exercise of the right granted in Section 3(b) of this License (the right to make Adaptations) would be deemed to be a distortion, mutilation, modification or other derogatory action prejudicial to the Original Author's honor and reputation, the Licensor will waive or not assert, as appropriate, this Section, to the fullest extent permitted by the applicable national law, to enable You to reasonably exercise Your right under Section 3(b) of this License (right to make Adaptations) but not otherwise.

## 5. Representations, Warranties and Disclaimer



UNLESS OTHERWISE MUTUALLY AGREED TO BY THE PARTIES IN WRITING, LICENSOR OFFERS THE WORK AS-IS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND CONCERNING THE WORK, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTIBILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, OR THE ABSENCE OF LATENT OR OTHER DEFECTS, ACCURACY, OR THE PRESENCE OF ABSENCE OF ERRORS, WHETHER OR NOT DISCOVERABLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO SUCH EXCLUSION MAY NOT APPLY TO YOU.

**6. Limitation on Liability.** EXCEPT TO THE EXTENT REQUIRED BY APPLICABLE LAW, IN NO EVENT WILL LICENSOR BE LIABLE TO YOU ON ANY LEGAL THEORY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF THIS LICENSE OR THE USE OF THE WORK, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

## 7. Termination

- a. This License and the rights granted hereunder will terminate automatically upon any breach by You of the terms of this License. Individuals or entities who have received Adaptations or Collections from You under this License, however, will not have their licenses terminated provided such individuals or entities remain in full compliance with those licenses. Sections 1, 2, 5, 6, 7, and 8 will survive any termination of this License.
- b. Subject to the above terms and conditions, the license granted here is perpetual (for the duration of the applicable copyright in the Work). Notwithstanding the above, Licensor reserves the right to release the Work under different license terms or to stop distributing the Work at any time; provided, however that any such election will not serve to withdraw this License (or any other license that has been, or is required to be, granted under the terms of this License), and this License will continue in full force and effect unless terminated as stated above.

## 8. Miscellaneous

- a. Each time You Distribute or Publicly Perform the Work or a Collection, the Licensor offers to the recipient a license to the Work on the same terms and conditions as the license granted to You under this License.
- b. Each time You Distribute or Publicly Perform an Adaptation, Licensor offers to the recipient a license to the original Work on the same terms and conditions as the license granted to You under this License.
- c. If any provision of this License is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this License, and without further action by the parties to this agreement, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.
- d. No term or provision of this License shall be deemed waived and no breach consented to unless such waiver or consent shall be in writing and signed by the party to be charged with such waiver or consent.
- e. This License constitutes the entire agreement between the parties with respect to the Work licensed here. There are no understandings, agreements or representations with respect to the Work not specified here. Licensor shall not be bound by any additional provisions that may appear in any communication from You. This License may not be modified without the mutual written agreement of the Licensor and You.
- f. The rights granted under, and the subject matter referenced, in this License were drafted utilizing the terminology of the Berne Convention for the Protection of Literary and Artistic Works (as amended on September 28, 1979), the Rome Convention of 1961, the WIPO Copyright Treaty of 1996, the WIPO Performances and Phonograms Treaty of 1996 and the Universal Copyright Convention (as revised on July 24, 1971). These rights and subject matter take effect in the relevant jurisdiction in which the License terms are sought to be enforced according to the corresponding provisions of the implementation of those treaty provisions in the applicable national law. If the standard suite of rights granted under applicable copyright law includes additional rights not granted under this License, such

additional rights are deemed to be included in the License; this License is not intended to restrict the license of any rights under applicable law.