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# Software Package Data Exchange (SPDX®) Specification

Version: 1.1-rc20120822a



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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 Odenca, 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.

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# 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.

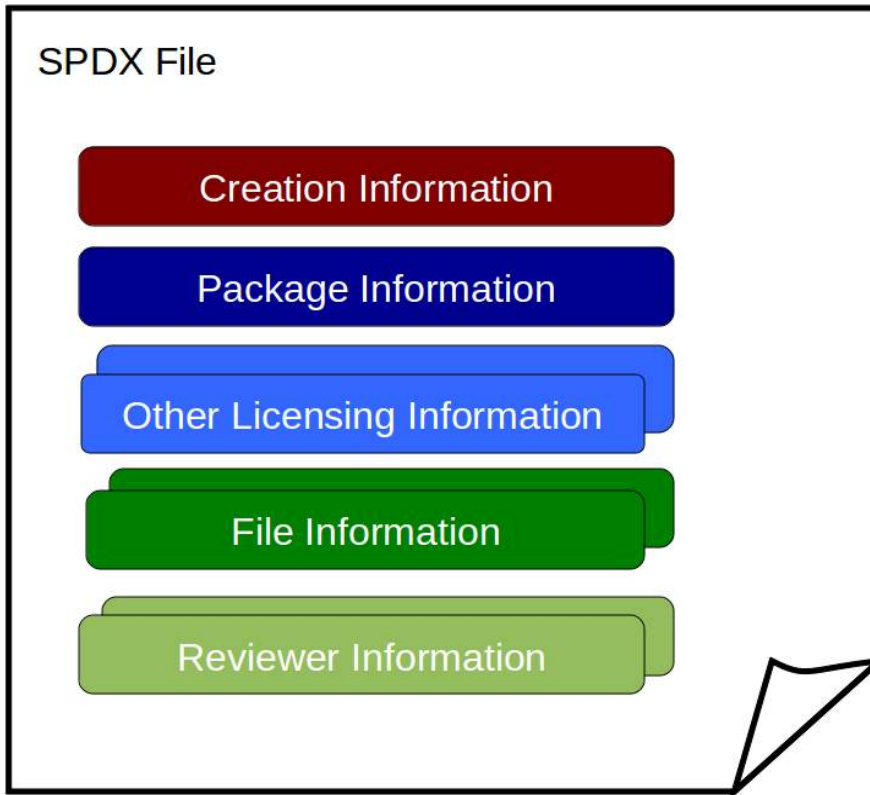


Figure 1. Overview of SPDX file contents.

## 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:

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## 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 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 a "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 brackets. 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>
This package provides the gnu c library, ....
</text>
```

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

**Example:**

```
<Package rdf:about="http://www.spdx.org/tools#SPDXANALYSIS?package">
  <description>
    This package provides the gnu c library, ....
  </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-rc20120822a.

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

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

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

**5.3.6 Tag:** "LicenseName:"

**Example:**

LicenseName: Beer-Ware License (Version 42)

**5.3.7 RDF: property** spdx:licenseName in **class** spdx:ExtractedLicensingInfo

**Example:**

```
<ExtractedLicensingInfo rdf:about="" :licenseRef-1>
  <licenseName> Beer-Ware License (Version 42) </licenseId>
</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” license. 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:"
- 6.8.6 RDF:** property `spdx:artifactOf/doap:Project/doap:name`

**Example:**

ArtifactOfProjectName: Jena

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

**Example:**

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

**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

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**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>
CIArtistic	<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>
ErIPL-1.1	<a href="#">Erlang Public License v1.1</a>

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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>
Framework-1.0	<a href="#">Framework 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>

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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>

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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

### Vocabulary

Version:

1.1-DRAFT (21 Aug 2012 18:26 UTC/61361e)

Latest Version:

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

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### 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 SdpxDocument 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 one
- [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 indicated 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 simple value that allows the contents of a file to be authenticated. Even small changes to the content of the file will change it's checksum value. 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/license/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 is declared by the authors of the package.

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 the 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 [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.

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 supported value 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 the contact information, of the person or organization who was the immediate supplier of the 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:

Any of:

- [xsd:string](#)
- [spdx:noassertion](#)

### Property: **versionInfo**

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

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: 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

**Individual: noassertion**

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

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 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.

```

Official SPDX® Specification 1.1-rc20120822a.

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```

        "|" / "}" /
        "~" )
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

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