



# Software Package Data Exchange (SPDX<sup>®</sup>)

Specification Version: 2.0

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# TABLE OF CONTENTS

<b>1</b>	<b>Rationale.....</b>	<b>6</b>
1.1	Charter .....	6
1.2	Definition .....	6
1.3	Why is a common format for data exchange needed? .....	6
1.4	What does this specification cover? .....	6
1.5	What is not covered in the specification? .....	7
1.6	Format Requirements .....	7
1.7	Conformance.....	8
1.8	Differences from SPDX Specification 1.2 .....	8
<b>2</b>	<b>Document Creation Information.....</b>	<b>10</b>
2.1	SPDX Version .....	10
2.2	Data License.....	10
2.3	SPDX Identifier.....	11
2.4	Document Name .....	12
2.5	SPDX Document Namespace .....	12
2.6	External Document References .....	14
2.7	License List Version.....	15
2.8	Creator .....	15
2.9	Created.....	16
2.10	Creator Comment.....	17
2.11	Document Comment.....	17
<b>3</b>	<b>Package Information.....</b>	<b>19</b>
3.1	Package Name .....	19
3.2	Package SPDX Identifier .....	19
3.3	Package Version .....	20
3.4	Package File Name .....	21
3.5	Package Supplier.....	21
3.6	Package Originator.....	22
3.7	Package Download Location.....	23
3.8	Package Verification Code .....	26
3.9	Package Checksum .....	27
3.10	Package Home Page .....	28
3.11	Source Information .....	29
3.12	Concluded License .....	29
3.13	All Licenses Information from Files .....	30
3.14	Declared License.....	31
3.15	Comments on License .....	32
3.16	Copyright Text .....	33
3.17	Package Summary Description .....	34
3.18	Package Detailed Description.....	34

3.19	Package Comment .....	35
<b>4</b>	<b>File Information .....</b>	<b>36</b>
4.1	File Name .....	36
4.2	File SPDX Identifier .....	36
4.3	File Type .....	37
4.4	File Checksum .....	38
4.5	Concluded License.....	39
4.6	License Information in File.....	40
4.7	Comments on License .....	41
4.8	Copyright Text .....	42
4.9	Artifact of Project Name.....	42
4.10	Artifact of Project Homepage .....	43
4.11	Artifact of Project Uniform Resource Identifier .....	44
4.12	File Comment.....	44
4.13	File Notice .....	45
4.14	File Contributor.....	46
4.15	File Dependencies (deprecated).....	46
<b>5</b>	<b>Other Licensing Information Detected .....</b>	<b>48</b>
5.1	License Identifier .....	48
5.2	Extracted Text .....	48
5.3	License Name.....	49
5.4	License Cross Reference .....	50
5.5	License Comment.....	50
<b>6</b>	<b>Relationships between SPDX Elements.....</b>	<b>52</b>
6.1	Relationship .....	52
6.2	Relationship Comment .....	56
<b>7</b>	<b>Annotations.....</b>	<b>57</b>
7.1	Annotator.....	57
7.2	Annotation Date .....	57
7.3	Annotation Type .....	58
7.4	SPDX Identifier Reference .....	58
7.5	Annotation Comment.....	59
<b>8</b>	<b>Review Information (deprecated).....</b>	<b>61</b>
8.1	Reviewer (deprecated) .....	61
8.2	Review Date (deprecated).....	62
8.3	Review Comment (deprecated).....	62
<b>Appendix I: SPDX License List .....</b>	<b>64</b>	
I.1	Licenses with Short Form Identifiers.....	64
I.2	Exceptions List .....	76
I.3	Deprecated Licenses.....	77
<b>Appendix II: License Matching Guidelines and Templates .....</b>	<b>78</b>	
<b>Appendix III: RDF Data Model Implementation and Identifier Syntax.....</b>	<b>79</b>	
Agent and Tool Identifiers .....	80	

<b>Appendix IV: SPDX License Expressions .....</b>	<b>81</b>
<b>Overview .....</b>	<b>81</b>
<b>Simple License Expressions .....</b>	<b>82</b>
<b>Composite License Expressions .....</b>	<b>82</b>
1) Disjunctive "OR" Operator .....	82
2) Conjunctive "AND" Operator .....	82
3) Exception "WITH" Operator .....	82
4) Order of Precedence and Parentheses .....	83
<b>Appendix V: Creative Commons Attribution License 3.0 Unported .....</b>	<b>84</b>

# 1 Rationale

## 1.1 Charter

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

## 1.2 Definition

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

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

Companies and organizations (collectively “Organizations”) are widely using and reusing open source and other software packages. Compliance with the associated licenses requires a set of analysis activities and due diligence that each Organization performs independently, which may include 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 Creation Information: Meta data to associate analysis results with a specific version of the SPDX file and license for use, and provide information on how, when, and by whom the SPDX file was created.
- 1.4.2**      Package Information: Facts that are common properties of the entire package.
- 1.4.3**      File Information: Facts (e.g. copyrights, licenses) that are specific to each file included in the package.
- 1.4.4**      Other Licensing Information Detected: A way to capture information about and refer to licenses that are not on the SPDX License List .
- 1.4.5**      Relationships Between SPDX Elements: Information on how Documents, Packages & Files relate to each other.

#### 1.4.6 Annotations: Information about when and by whom the SPDX file was reviewed.

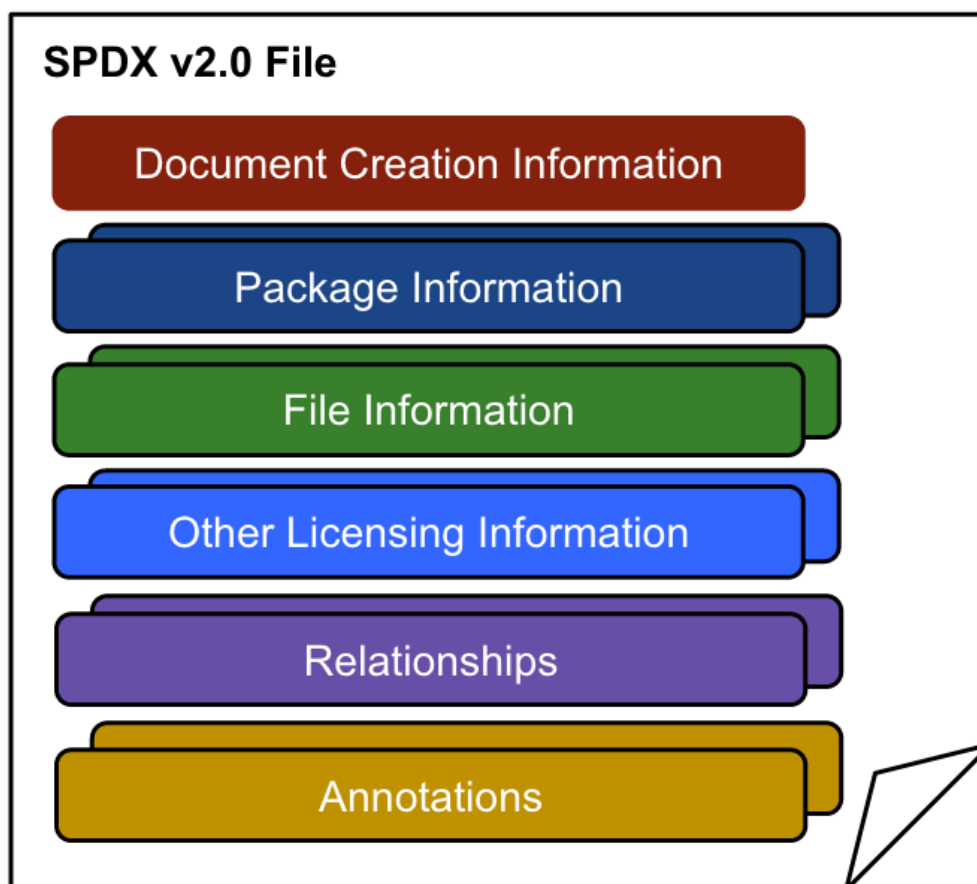


Figure 1 Overview of SPDX 2.0 document contents.

## 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 annotated tag value flat text file.
- 1.6.7** Interoperability with an annotate tag format and the RDF format will be preserved.
- 1.6.8** Tags and RDF properties are case sensitive.

## 1.7 Conformance

- 1.7.1** A file can be designated an SPDX document, if it is compliant with the requirements of the SPDX Trademark License (See the [SPDX Trademark Page](#)).
- 1.7.2** The official copyright notice to be used with any verbatim reproduction and/or distribution of this SPDX Specification 2.0 is:

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## 1.8 Differences from SPDX Specification 1.2

- 1.8.1** Abstraction has been applied to the underlying model with the inclusion of SPDX elements. With SPDX 2.0, the concept of an SPDX element is introduced (see Appendix III). This includes SPDX Documents, SPDX Files, and SPDX Packages, each of which gets associated with an SPDX Identifier which is denoted by "SPDXRef-".
- 1.8.2** SPDX relationships have been added to allow any SPDX element to have a relationship to other SPDX elements. This can be used for a variety of purposes including documenting a



hierarchy of sub-packages, documenting the origin of an SPDX element, and documenting modifications or corrections (annotations) to an SPDX element.

**1.8.3** The ability to reference SPDX elements outside the current SPDX document itself (external references).

**1.8.4** Additional file types are now supported.

**1.8.5** Additional checksum algorithms are now supported.

**1.8.6** Review Information section is deprecated. It is recommended to provide document reviews with Annotations (Section 7).

**1.8.7** A License Expression Syntax has been introduced and documented in Appendix IV.

## 2 Document Creation 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 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-2.0

**2.1.6 RDF: spdx:specVersion**

**Example:**

```
<SpdxDocument rdf:about="">
  <specVersion>SPDX-2.0</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 document creator 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 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 presence 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="">
  <dataLicense rdf:resource="http://spdx.org/licenses/CC0-1.0" />
</SpdxDocument>
```

## 2.3 SPDX Identifier

**2.3.1 Purpose:** Identify the current SPDX document which may be referenced in relationships by other files, packages internally and documents externally. To reference another SPDX document in total, this identifier should be used with the external document identifier preceding it. See the "Relationships between SPDX Elements" section for examples .

**2.3.2 Intent:** Provide a way for the document to refer to itself in relationship to other elements.

**2.3.3 Cardinality: Mandatory, one.**

**2.3.4 DataFormat: "SPDXRef-DOCUMENT"**

**2.3.5 Tag: "SPDXID:"**

**Example:**

SPDXID: SPDXRef-DOCUMENT

- 2.3.6 RDF:** The URI for the document is the document namespace appended by “#SPDXRef-DOCUMENT”

```
<spdx:SpdxDocument rdf:about="http://spdx.org/spdxdocs/spdx-example-444504E0-4F89-41D3-9A0C-0305E82C3301#SPDXRef-DOCUMENT">
...
</spdx:SpdxDocument>
```

## 2.4 Document Name

- 2.4.1 Purpose:** Identify name of this document as designated by creator.
- 2.4.2 Intent:** Here, the name of each document is an important convention and easier to refer to than the URI.
- 2.4.3 Cardinality:** Mandatory, one.
- 2.4.4 DataFormat:** single line of text.
- 2.4.5 Tag:** “DocumentName:”

**Example:**

```
DocumentName: glibc-v2.3
DocumentName: ubuntu-14.04
```

- 2.4.6 RDF:** property spdx:name in class Document

**Example:**

```
<SpdxDocument rdf:about="">
  <name>glibc-v2.3</name>
</SpdxDocument>

<SpdxDocument rdf:about="">
  <name>ubuntu-14.04</name>
</SpdxDocument>
```

## 2.5 SPDX Document Namespace

- 2.5.1 Purpose:** This field provided an SPDX document specific namespace as a unique absolute [Uniform Resource Identifier](#) (URI) as specified in [RFC 2396](#), with the exception of the ‘#’ delimiter. The URI must be unique for the SPDX document including the specific version of the SPDX document. If the SPDX document is updated, thereby creating a new version, a new URI for the updated document must be used. There can only be one URI for an SPDX document and only one SPDX document for a given URI. The SPDX Document URI cannot contain a URI “part” (e.g. the “#” character), since the “#” is used to uniquely identify SPDX element identifiers.

- 2.5.2 Intent:** The URI provides an unambiguous mechanism for other SPDX documents to reference SPDX elements within this SPDX document. See section 3.5 for a description on how

external documents are referenced. Although it is not required, the URI can be constructed in a way which provides information on how the SPDX document can be found. For example, the URI can be a URL referencing the SPDX document itself, if it is available on the internet. A best practice for creating the URI for SPDX documents available on the public internet is `http://[CreatorWebsite]/[pathToSpdx]/[DocumentName]-[UUID]` where:

- CreatorWebsite is a website hosted by the creator of the document. (e.g. an SPDX document provided by SPDX would be `spdx.org`)
- PathToSpdx is a path to where SPDX documents are stored on the website (e.g. `/spdx/spdxdocs`)
- DocumentName is a name given to the SPDX Document itself, typically the (set of) package name(s) followed by the version. (see section 2.4).
- UUID is a [universally unique identifier](#). The UUID could be a version 4 random UUID which can be generated from the [Online UUID Generator](#) or a version 5 UUID generated from a sha1 checksum known to be unique for this specific SPDX document version.
- If the creator does not own their own website, a default SPDX CreatorWebsite and PathToSpdx can be used `'spdx.org/spdxdocs'`. Note that the SPDX documents are not currently stored or accessible on this website. The URI is only used to create a unique ID following the above conventions.

Note that the URI does not have to be accessible. It is only intended to provide a unique ID. In many cases, the URI will point to a web accessible document, but this should not be assumed to be the case.

**2.5.3 Cardinality:** Mandatory, one.

**2.5.4 Data Format:** unique absolute [Uniform Resource Identifier](#) (URI) as specified in [RFC 2396](#), with the exception of the '#' character.

The URI must be unique for the SPDX document including the specific version of the SPDX document. If the SPDX document is updated, thereby creating a new version, a new URI for the updated document must be used. There can only be one URI for an SPDX document and only one SPDX document for a given URI.

The SPDX Document URI cannot contain a URI "part" (e.g. the "#" delimiter), since the "#" is used to uniquely identify SPDX element identifiers.

**2.5.5 Tag:** "DocumentNamespace:"

**Example:**

DocumentNamespace:`http://spdx.org/spdxdocs/spdx-tools-v1.2-3F2504E0-4F89-41D3-9A0C-0305E82C3301`

**2.5.6 RDF:** The unique ID is the URI for the SPDX document

**Example:**

<SpxDocument  
rdf:about="http://spdx.org/spdxdocs/spdx-tools-v1.2-3F2504E0-4F89-41D3-9A0C-0305E82C3301">

```

<rdfs:comment>
  This document was created using SPDX 2.0 using licenses from the web site.
</rdfs:comment>
</SpdxDocument>

```

## 2.6 External Document References

**2.6.1 Purpose:** Identify any external SPDX documents referenced within this SPDX document.

**2.6.2 Intent:** SPDX elements may be related to other SPDX elements. These elements may be in external SPDX documents. An SPDX element could be a file, package, or SPDX document.

**2.6.3 Cardinality:** Optional, one or many.

**2.6.4 Data Format:** “DocumentRef-”[idstring] [SPDX Document URI] [Checksum]  
 where  
 [idstring] is a unique string containing letters, numbers, “.”, “-” or “+”.  
 [SPDX Document URI] is the unique ID for the external document  
 as defined in section 2.5 of that referenced document,  
 [Checksum] is a checksum of the external document following the checksum  
 format defined in section 3.9.

**2.6.5 Tag:** “ExternalDocumentRef:”

**Example:**

```
ExternalDocumentRef: DocumentRef-spx-tool-1.2 http://spdx.org/spdxdocs/spdx-tools-
v1.2-3F2504E0-4F89-41D3-9A0C-0305E82C3301 SHA1: d6a770ba38583ed4bb4525bd96e50461655d2759
```

**2.6.6 RDF:** property `spdx:externalDocumentRef` in class `spdx:Document` range `ExternalDocumentRef`. The `ExternalDocumentRef` contains two properties:

- `spdxDocument` - the `SpdxDocument` being referenced
- `checksum` - the checksum of the referenced SPDX document

**Example:**

```

<externalDocumentRef>
  <ExternalDocumentRef>
    <spdx:externalDocumentId>DocumentRef-spx-tool-
1.2</spdx:externalDocumentId>
    <spdxDocument rdf:about="http://spdx.org/spdxdocs/spdx-tools-v1.2-3F2504E0-4F89-
41D3-9A0C-0305E82C3301" />
    <checksum>
      <Checksum>
        <algorithm rdf:resource="checksumAlgorithm_sha1"/>
        <checksumValue>d6a770ba38583ed4bb4525bd96e50461655d2758
        </checksumValue>
      </Checksum>
    </checksum>
  </ExternalDocumentRef>
</externalDocumentRef>

```

Notes: in RDF, a namespace can be created for the external document reference if a short form name for the external reference is desired.

## 2.7 License List Version

**2.7.1 Purpose:** An optional field for creators of the SPDX file to provide the version of the SPDX License List used when the SPDX file was created.

**2.7.2 Intent:** Recognizing that licenses are added to the SPDX License List over time, and with each subsequent version, the intent is to provide recipients of the SPDX file with the version of the SPDX License List used. This anticipates that in the future, an SPDX file may have used a version of the SPDX License List that is older than the then current one.

**2.7.3 Cardinality:** Optional, one.

**2.7.4 Data Format:** “M.N”  
where:  
M is major version number  
N is minor version number.

**2.7.5 Tag:** “LicenseListVersion:”

Example:  
LicenseListVersion: 2.0

**2.7.6 RDF:** property licenseListVersion in class spdx:CreationInfo

Example:  
<CreationInfo>  
  <licenseListVersion>2.0</licenseListVersion>  
</CreationInfo>

## 2.8 Creator

**2.8.1 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, 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.

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

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

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

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

"Tool: toolidentifier-version"

### 2.8.5 Tag: "Creator:"

Example:

Creator: Person: Jane Doe ()

Creator: Organization: ExampleCodeInspect ()

Creator: Tool: LicenseFind-1.0

### 2.8.6 RDF: property spdx:creator in class spdx:CreationInfo

Example:

```
<CreationInfo>
```

```
  <creator> Person: Jane Doe () </creator>
```

```
  <creator> Organization: ExampleCodeInspect () </creator>
```

```
  <creator> Tool: LicenseFind-1.0 </creator>
```

```
</CreationInfo>
```

## 2.9 Created

**2.9.1 Purpose:** Identify when the SPDX file was originally created. The date is to be specified according to combined date 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.

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

**2.9.3 Cardinality:** Mandatory, one.

**2.9.4 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

### 2.9.5 Tag: "Created:"

Example:

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

### 2.9.6 RDF: property spdx:created in class spdx:CreationInfo

Example:



```
<CreationInfo>
  <created> 2010-01-29T18:30:22Z </created>
</CreationInfo>
```

## 2.10 Creator Comment

**2.10.1 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.

**2.10.2 Intent:** Here, the intent is to provide recipients of the SPDX file with comments by the creator of the SPDX file.

**2.10.3 Cardinality:** Optional, one.

**2.10.4 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>`.

**2.10.5 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>
```

**2.10.6 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>
```

## 2.11 Document Comment

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

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

**2.11.3 Cardinality:** Optional, one.

**2.11.4 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>`.

**2.11.5 Tag:** "DocumentComment:"

Example:

DocumentComment: <text>

This document was created using SPDX 2.0, version 2.3 of the SPDX License List and referring to licenses in file MyCompany.Approved.Licenses.spdx.

</text>

**2.11.6 RDF:** property rdfs:comment in class SpdxDocument

Example:

<SpdxDocument rdf:about="">

<rdfs:comment>

This document was created using SPDX 2.0, version 2.3 of the SPDX License List and referring to licenses in file MyCompany.Approved.Licenses.spdx.

</rdfs:comment>

</SpdxDocument>

## 3 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.

In SPDX 2.0, it is not necessary to have a package wrapping a set of files.

In tag:value format, the order in which package and files occur is syntactically significant.

- A new Package Information section is denoted by the Package Name field.
- All Package Information fields must be grouped together before the start of a Files section.
- All files contained in a package must immediately follow the package.
- A new Package Information section (via Package Name) denotes the start of an other package.
- Sub-packages should not be nested inside a Package Information section, but should be separate and should use a Relationship to clarify.
- Annotations on the package and Relationships from the package may appear after the Package Information before any file information.

Fields:

### 3.1 Package Name

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

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

**3.1.3 Cardinality:** Mandatory, one.

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

**3.1.5 Tag:** "PackageName:"

**Example:**

PackageName: glibc

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

**Example:**

```
<Package rdf:about="">
  <name>glibc</name>
</Package>
```

### 3.2 Package SPDX Identifier

**3.2.1 Purpose:** Uniquely identify any element in an SPDX document which may be referenced by other elements. These may be referenced internally and externally with the addition of the SPDX Document Identifier.

**3.2.2 Intent:** There may be several versions of the same package within an SPDX

document. Each element needs to be able to be referred to uniquely so that relationships between elements can be clearly articulated.

**3.2.3 Cardinality:** Mandatory, one.

**3.2.4 DataFormat:** “SPDXRef-[idstring]”

where **[idstring]** is a unique string containing letters, numbers, “.”, “-”.

**3.2.5 Tag:** “SPDXID:”

**Example:**  
SPDXID: SPDXRef-1

**3.2.6 RDF:** The URI for the element will follow the form: [SpdxDocumentURI]#SPDXRef-[idstring] where [SpdxDocumentURI] is the URI for the SPDX Document containing the element.

**Example using xml:base:**

```
<rdf:RDF xml:base=
"http://acme.com/spdxdocs/acmeproject/v1.2/1BE2A4FF-5F1A-48D3-8483-28A9B0349A1B">
...
<Package rdf:ID="SPDXRef-1">
...
</Package>
```

**Example using document URI:**

```
<Package rdf:about=
"http://acme.com/spdxdocs/acmeproject/v1.2/1BE2A4FF-5F1A-48D3-8483-28A9B0349A1B#SPDXRef-1">
...
</Package>
```

## 3.3 Package Version

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

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

**3.3.3 Cardinality:** Optional, one.

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

**3.3.5 Tag:** “PackageVersion:”

**Example:**  
PackageVersion: 2.11.1

**3.3.6 RDF: property** `spdx:versionInfo` in **class** `spdx:Package`**Example:**

```
<Package rdf:about="">
  <versionInfo>2.11.1</versionInfo>
</Package>
```

**3.4 Package File Name**

**3.4.1 Purpose:** Provide the actual file name of the package, or path of the directory being treated as a package. This may include the packaging and compression methods used as part of the file name, if appropriate.

**3.4.2 Intent:** Here, the actual file name of the compressed file containing the package may be a significant technical element that needs to be included with each package identification information. If a grouping, like a set of files in a subdirectory, is being treated as a package, the subdirectory name may be appropriate to provide. Subdirectory name is preceded with a “./”, see <http://www.ietf.org/rfc/rfc3986.txt> for syntax.

**3.4.3 Cardinality:** Optional, one.

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

**3.4.5 Tag:** “PackageFileName.”

**Example:**

```
PackageFileName: glibc-2.11.1.tar.gz
```

**Example (subdirectory being treated as a package):**

```
PackageFileName: ./myrootdir/mysubdir1
```

**3.4.6 RDF: property** `spdx:packageFileName` in **class** `spdx:Package`**Example:**

```
<Package rdf:about="">
  <packageFileName>glibc 2.11.1.tar.gz</packageFileName>
</Package>
```

**Example (subdirectory being treated as a package):**

```
<Package rdf:about="">
  <packageFileName>./myrootdir/mysubdir1</packageFileName>
</Package>
```

**3.5 Package Supplier**

**3.5.1 Purpose:** Identify the actual distribution source for the package/directory 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).

**3.5.2 Intent:** This field assists with understanding the point of distribution for the code in the package. This field is vital for ensuring that 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.

**3.5.3 Cardinality:** Optional, one.

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

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

**3.5.5 Tag:** "PackageSupplier:"

**Example:**

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

**3.5.6 RDF:** property spdx:supplier in class spdx:Package

**Example:**

```
<Package rdf:about="">
  <supplier>Person: Jane Doe (jane.doe@example.com) </supplier>
</Package>
```

## 3.6 Package Originator

**3.6.1 Purpose:** If the package identified in the SPDX file originated from a different person or organization than identified as Package Supplier (see section 3.5 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 originator 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).

**3.6.2 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.

**3.6.3 Cardinality:** Optional, one.

**3.6.4 Data Format:** single line of text with the following keywords | “NOASSERTION”

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

**3.6.5 Tag:** “PackageOriginator:”

**Example:**

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

**3.6.6 RDF:** property spdx:originator in class spdx:Package

**Example:**

```
<Package rdf:about="">
  <originator>Organization: ExampleCodeInspect (contact@example.com)
</originator>
</Package>
```

## 3.7 Package Download Location

**3.7.1 Purpose:** This section identifies the download Universal Resource Locator (URL), or a specific location within a version control system (VCS) for the package at the time that the SPDX file was created.

- NONE should be used if there is no public (or internal) URL whatsoever.
- NOASSERTION should be used if the SPDX file creator has made no attempt to determine the download location, has intentionally provided no information (no meaning should be implied by doing so) or there is insufficient knowledge about whether a public or internal download mechanism exists.

**3.7.2 Intent:** Here, where and how to download the exact package being referenced is critical verification and tracking data.

**3.7.3 Cardinality:** Mandatory, one.

**3.7.4 Data Format:** uniform resource locator | VCS location | “NONE” | “NOASSERTION”

For version-controlled files, the VCS location syntax is similar to a URL and has the:  
<vcs\_tool>+<transport>://<host\_name>[/<path\_to\_repository>][@<revision\_tag\_or\_branch>][#<sub\_path>]

This VCS location compact notation (inspired and mostly adopted from [https://pip.pypa.io/en/latest/reference/pip\\_install.html#vcs-support](https://pip.pypa.io/en/latest/reference/pip_install.html#vcs-support) as of 20150220) supports referencing locations in version control systems such as Git, Mercurial, Subversion and Bazaar, and specifies the type of VCS tool using url prefixes: “git+”, “hg+”, “bzt+”, “svn+” and specific transport schemes such as SSH or HTTPS.

Specifying sub-paths, branch names, a commit hash, a revision or a tag name is recommended, and supported using the “@” delimiter for commits and the “#” delimiter for

sub-paths.

Using user names and password in the host\_name is not supported and should be considered as an error. User access control to URLs or VCS repositories must be handled outside of an SPDX document.

In VCS location compact notations, the trailing slashes in <host\_name>, <path\_to\_repository> are not significant. Leading and trailing slashes in <sub\_path> are not significant.

### 3.7.5 Tag: "PackageDownloadLocation:"

#### Example for a plain URL:

PackageDownloadLocation: <http://ftp.gnu.org/gnu/glibc/glibc-ports-2.15.tar.gz>

#### Example for Git:

SPDX supports git, git+git, git+https, git+http and git+ssh transports. git and git+git are equivalent.

Here are the supported forms:

```
PackageDownloadLocation: git://git.myproject.org/MyProject
PackageDownloadLocation: git+https://git.myproject.org/MyProject.git
PackageDownloadLocation: git+http://git.myproject.org/MyProject
PackageDownloadLocation: git+ssh://git.myproject.org/MyProject.git
PackageDownloadLocation: git+git://git.myproject.org/MyProject
PackageDownloadLocation: git+git@git.myproject.org:MyProject
```

To specify a sub-path to a file or directory inside a repository use the "#" delimiter:

```
PackageDownloadLocation: git://git.myproject.org/MyProject#src/somefile.c
PackageDownloadLocation: git+https://git.myproject.org/MyProject#src/Class.java
```

To specify branch names, a commit hash or a tag name, use the "@" delimiter:

```
PackageDownloadLocation: git://git.myproject.org/MyProject.git@master
PackageDownloadLocation: git+https://git.myproject.org/MyProject.git@v1.0
PackageDownloadLocation:
git://git.myproject.org/MyProject.git@da39a3ee5e6b4b0d3255bfef95601890afd80709
```

Sub-paths and branch names or commit hash can be combined too:

```
PackageDownloadLocation: git+https://git.myproject.org/MyProject.git@master#src/MyClass.cpp
PackageDownloadLocation:
git+https://git.myproject.org/MyProject@da39a3ee5e6b4b0d3255bfef95601890afd80709#lib/variable.rb
```

#### Example for Mercurial:

SPDX supported schemes are: hg+http, hg+https, hg+static-http and hg+ssh.

The supported forms are:

```
PackageDownloadLocation: hg+http://hg.myproject.org/MyProject
PackageDownloadLocation: hg+https://hg.myproject.org/MyProject
PackageDownloadLocation: hg+ssh://hg.myproject.org/MyProject
```

To specify a sub-path to a file or directory inside a repository use the "#" delimiter:

```
PackageDownloadLocation: hg+https://hg.myproject.org/MyProject#src/somefile.c
```



PackageDownloadLocation: hg+https://hg.myproject.org/MyProject#src/Class.java

To pass branch names, a commit hash, a tag name or a local branch name use the "@" delimiter:

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@da39a3ee5e6b

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@2019

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@v1.0

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@special\_feature

Sub-paths and branch names or commit hash can be combined too:

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@master#/src/MyClass.cpp

PackageDownloadLocation: hg+https://hg.myproject.org/MyProject@da39a3ee5e6b#lib/variable.rb

### Example for Subversion:

SPDX supports the URL schemes svn, svn+svn, svn+http, svn+https, svn+ssh. svn and svn+svn are equivalent.

The supported forms are:

PackageDownloadLocation: svn://svn.myproject.org/svn/MyProject

PackageDownloadLocation: svn+svn://svn.myproject.org/svn/MyProject

PackageDownloadLocation: svn+http://svn.myproject.org/svn/MyProject/trunk

PackageDownloadLocation: svn+https://svn.myproject.org/svn/MyProject/trunk

To specify a sub-path to a file or directory inside a repository use the "#" delimiter:

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject#src/somefile.c

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject#src/Class.java

This support is less important for SVN since the URL path can also contain sub-paths; this two forms are equivalent:

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject/trunk#src/somefile.c

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject/trunk/src/somefile.c

You can specify a revision using the "@" delimiter:

PackageDownloadLocation: svn+https://svn.myproject.org/svn/MyProject/trunk@2019

Sub-paths and revisions can be combined too:

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject@123#/src/MyClass.cpp

PackageDownloadLocation: svn+https://svn.myproject.org/MyProject/trunk@1234#lib/variable/variable.rb

### Example for Bazaar:

SPDX supports Bazaar using the bzd+http, bzd+https, bzd+ssh, bzd+sftp, bzd+ftp and bzd+lp schemes.

The supported forms are:

PackageDownloadLocation: bzd+https://bzd.myproject.org/MyProject/trunk

PackageDownloadLocation: bzd+http://bzd.myproject.org/MyProject/trunk

PackageDownloadLocation: bzd+sftp://myproject.org/MyProject/trunk

PackageDownloadLocation: bzd+ssh://myproject.org/MyProject/trunk

PackageDownloadLocation: bzd+ftp://myproject.org/MyProject/trunk

PackageDownloadLocation: bzd+lp:MyProject

To specify a sub-path to a file or directory inside a repository use the "#" delimiter:

PackageDownloadLocation: bzd+https://bzd.myproject.org/MyProject/trunk#src/somefile.c

PackageDownloadLocation: bzd+https://bzd.myproject.org/MyProject/trunk#src/Class.java

You can specify a revision or tag using the "@" delimiter:

```
PackageDownloadLocation: bzd+https://bzd.myproject.org/MyProject/trunk@2019
PackageDownloadLocation: bzd+http://bzd.myproject.org/MyProject/trunk@v1.0
```

Sub-paths and revisions can be combined too:

```
PackageDownloadLocation: bzd+https://bzd.myproject.org/MyProject/trunk@2019#src/somefile.c
```

### 3.7.6 RDF: property `spdx:downloadLocation` in class `spdx:Package`

**Example:**

```
<Package rdf:about="">
  <downloadLocation>
    http://ftp.gnu.org/gnu/glibc/glibc-ports-2.15.tar.gz
  </downloadLocation>
</Package>
```

```
<Package rdf:about="">
  <downloadLocation>
    git+https://git.myproject.org/MyProject.git@v10.0#src/lib.c
  </downloadLocation>
</Package>
```

## 3.8 Package Verification Code

**3.8.1 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.

**3.8.2 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.

**3.8.3 Cardinality:** Mandatory, one.

**3.8.4 Algorithm:**

```
verificationcode = 0
filelist = templist = ""
for all files in the package {
  if file is an "excludes" file, skip it /* exclude SPDX analysis file(s) */
  append 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.

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

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

**3.8.6 Tag:** “PackageVerificationCode:” (and optionally “(excludes: FileName)”) where FileName is as specified in 6.1.

**Example:**

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

**4.8.7 RDF:** spdx:packageVerificationCodeValue, spdx:packageVerificationCodeExcludedFile in class spdx:PackageVerificationCode

**Example:**

```
<Package rdf:about="">
  <packageVerificationCode>
    <PackageVerificationCode>
      <packageVerificationCodeValue>d6a770ba38583ed4bb4525bd96e50461655d2758
    </packageVerificationCodeValue>
    <packageVerificationCodeExcludedFile> ./package.spdx
    </packageVerificationCodeExcludedFile>
  </PackageVerificationCode>
</packageVerificationCode>
</Package>
```

## 3.9 Package Checksum

**3.9.1 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.

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

**3.9.3 Cardinality:** Optional, one or many.

**3.9.4 Algorithms that can be used:** SHA1, SHA256, MD5

**3.9.5 Data Format:** There are three components, an algorithm identifier(“SHA1”), a colon separator “:” and a bit value represented as lowercase hexadecimal digits (appropriate as output to the algorithm).

**3.9.6 Tag:** “PackageChecksum:”

**Example:**

```
PackageChecksum: SHA1: 85ed0817af83a24ad8da68c2b5094de69833983c
PackageChecksum: SHA256:
11b6d3ee554eedf79299905a98f9b9a04e498210b59f15094c916c91d150efcd
PackageChecksum: MD5: 624c1abb3664f4b35547e7c73864ad24
```

**3.9.7 RDF: properties** spdx:algorithm, spdx:checksumValue in **class** spdx:checksum**Example:**

```

<Package rdf:about="">
  <checksum>
    <Checksum>
      <algorithm rdf:resource="http://spdx.org/rdf/terms#checksumAlgorithm_sha1"/>
      <checksumValue> 85ed0817af83a24ad8da68c2b5094de69833983c
      </checksumValue>
    </Checksum>
    <Checksum>
      <algorithm
        rdf:resource="http://spdx.org/rdf/terms#checksumAlgorithm_sha256"/>
      <checksumValue>
        11b6d3ee554eedf79299905a98f9b9a04e498210b59f15094c916c91d150efcd
      </checksumValue>
    </Checksum>
    <Checksum>
      <algorithm rdf:resource="http://spdx.org/rdf/terms#checksumAlgorithm_md5"/>
      <checksumValue> 624c1abb3664f4b35547e7c73864ad24
      </checksumValue>
    </Checksum>
  </checksum>
</Package>

```

**3.10 Package Home Page**

**3.10.1 Purpose:** This field provides a place for the SPDX file creator to record a web site that serves as the package's home page. This link can also be used to reference further information about the package referenced by the SPDX file creator.

- NONE should be used if there is no package home page whatsoever.
- NOASSERTION should be used if the SPDX file creator has made no attempt to determine the home page, has intentionally provided no information (no meaning should be implied by doing so) or there is insufficient knowledge about whether a home page exists.

**3.10.2 Intent:** Here, by providing a link to the package's home page, the SPDX file creator can provide additional information useful for analysis. This saves the recipient of the SPDX file who is looking for more info from having to search for and verify a match between the package and the associated project homepage.

**3.10.3 Cardinality:** Optional, one.

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

**3.10.5 Tag:** "PackageHomePage:"

**Example:**

PackageHomePage: <http://ftp.gnu.org/gnu/glibc>

### 3.10.6 RDF: property doap:homepage in class spdx:Package

**Example:**

```
<Package rdf:about="">
  <doap:homepage >http://ftp.gnu.org/gnu/glibc/"</doap:homepage>
</Package>
```

## 3.11 Source Information

**3.11.1 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 was pulled from a source code management system or has been repackaged.

**3.11.2 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.

**3.11.3 Cardinality:** Optional, one.

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

**3.11.5 Tag:** "PackageSourceInfo:"

**Example:**

```
PackageSourceInfo: <text>
uses glibc-2_11-branch from git://sourceware.org/git/glibc.git. </text>
```

**3.11.6 RDF:** spdx:sourceInfo

**Example:**

```
<Package rdf:about="">
  <sourceInfo>uses glibc-2_11-branch from git://sourceware.org/git/glibc.git.
  </sourceInfo>
</Package>
```

## 3.12 Concluded License

**3.12.1 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 valid SPDX License Expression as defined in Appendix IV.
- NONE should be used if there is no licensing information from which to conclude a license for the package.
- 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).

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 3.15). With respect to NOASSERTION, a written explanation in the Comments on License field (section 3.15) is preferred.

**3.12.2 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.

**3.12.3 Cardinality:** Mandatory, one.

**3.12.4 Data Format:** <SPDX License Expression> | “NONE” | “NOASSERTION”

where:

<SPDX License Expression> is a valid SPDX License Expression as defined in Appendix IV.

**3.12.5 Tag:** “PackageLicenseConcluded:”

**Example:**

PackageLicenseConcluded: LGPL-2.0

**Example:**

PackageLicenseConcluded: (LGPL-2.0 OR LicenseRef-3)

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

**Example:**

```
<Package rdf:about="">
  <licenseConcluded rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
</Package>
```

**Example:**

```
<Package rdf:about="">
  <licenseConcluded>
    <DisjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
      <member rdf:resource="LicenseRef-3" />
    </DisjunctiveLicenseSet>
  </licenseConcluded>
</Package>
```

## 3.13 All Licenses Information from Files

**3.13.1 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:

- the SPDX License List short form identifier, if a detected license is on the SPDX License List.
- a user defined license reference denoted by LicenseRef-[idstring] (for a license not on the SPDX License List).
- NONE, if no license information is detected in any of the files.
- 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).

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

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

**3.13.4 Data Format:** <short form identifier in Appendix I> |  
 ["DocumentRef-"[idstring]":"LicenseRef"-[idstring] |  
 | "NONE" | "NOASSERTION"

where:

SPDX "DocumentRef-"[idstring] is an optional reference to an external

document as described in section 2.6

[idstring] is a unique string containing letters, numbers, ".", or "-"

**3.13.5 Tag:** "PackageLicenseInfoFromFiles:"

**Example:**

PackageLicenseInfoFromFiles: GPL-2.0

PackageLicenseInfoFromFiles: LicenseRef-1

PackageLicenseInfoFromFiles: LicenseRef-2

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

**Example:**

```
<Package rdf:about="">
  <licenseInfoFromFiles rdf:resource=" http://spdx.org/licenses/GPL-2.0" />
  <licenseInfoFromFiles rdf:resource="LicenseRef-1" />
  <licenseInfoFromFiles rdf:resource="LicenseRef-2" />
</Package>
```

## 3.14 Declared License

**3.14.1 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 valid SPDX License Expression as defined in Appendix IV.
- NONE, if no license information is detected in any of the files.
- 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).

**3.14.2 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 Concluded License (section 3.12). This field may have multiple Declared Licenses, if multiple licenses are declared at the package level.

**3.14.3 Cardinality:** Mandatory, one.

**3.14.4 Data Format:** <SPDX License Expression> | “NONE” | “NOASSERTION”

where:

<SPDX License Expression> is a valid SPDX License Expression as defined in Appendix IV.

**3.14.5 Tag:** “PackageLicenseDeclared:”

**Example:**

PackageLicenseDeclared: LGPL-2.0

**Example:**

PackageLicenseDeclared: (LGPL-2.0 **AND** LicenseRef-3)

**3.14.6 RDF: property** spdx:licenseDeclared in **class** spdx:Package

**Example:**

```
<Package rdf:about="">
  <licenseDeclared rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
</Package>
```

**Example:**

```
<Package rdf:about="">
  <licenseDeclared>
    <ConjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0" />
      <member rdf:resource="LicenseRef-3" />
    </ConjunctiveLicenseSet>
  </licenseDeclared>
</Package>
```

## 3.15 Comments on License

**3.15.1 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. It is also preferable to include an explanation here when the Concluded License is NOASSERTION.

**3.15.2 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.



**3.15.3 Cardinality:** Optional, one.

**3.15.4 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>`.

**3.15.5 Tag:** "PackageLicenseComments:"

**Example:**

PackageLicenseComments: `<text>`

The license for this project changed with the release of version 1.4. The version of the project included here post-dates the license change.

`</text>`

**3.15.6 RDF: property** `spdx:licenseComments` in **class** `spdx:Package`

**Example:**

`<Package rdf:about="">`

`<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>`

## 3.16 Copyright Text

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

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

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

**3.16.3 Cardinality:** Mandatory, one.

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

**3.16.5 Tag:** "PackageCopyrightText:"

In tag format multiple lines are delimited by `<text> .. </text>`.

**Example:**

PackageCopyrightText: `<text>`

Copyright 2008-2010 John Smith

`</text>`

**3.16.6 RDF: property** `spdx:copyrightText` in **class** `spdx:Package`

**Example:**

```
<Package rdf:about="">
  <copyrightText>
    Copyright 2008-2010 John Smith
  </copyrightText>
</Package>
```

**3.17 Package Summary Description**

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

**3.17.2 Intent:** Here, the intent is to allow the SPDX file creator to provide concise information about the function or use of the package without having to parse the source code of the actual package.

**3.17.3 Cardinality:** Optional, one.

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

**3.17.5 Tag:** “PackageSummary:”  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

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

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

**Example:**

```
<Package rdf:about="">
  <summary> GNU C library.</summary>
</Package>
```

**3.18 Package Detailed Description**

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

**3.18.2 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.

**3.18.3 Cardinality:** Optional, one.

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

**3.18.5 Tag:** “PackageDescription:”  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

```
PackageDescription: <text>
```

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

</text>

### 3.18.6 RDF: property `spdx:description` in class `spdx:Package`

**Example:**

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

## 3.19 Package Comment

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

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

**3.19.3 Cardinality:** Optional, one.

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

**3.19.5 Tag:** "PackageComment:"  
In tag format multiple lines are delimited by `<text> .. </text>`.

**Example:**

```
PackageComment: <text>
The Concluded License was found in the COPYING.txt file in the xyz directory.
</text>
```

### 3.19.6 RDF: property `rdfs:comment` in class `spdx:Package`

**Example:**

```
<Package rdf:about="">
  <rdfs:comment>
    The Concluded License was found in the COPYING.txt file
    in the xyz directory.
  </rdfs:comment>
</Package>
```

## 4 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. In SPDX 2.0, it is not necessary to have a package wrapping a set of files.

When implementing tag:value format, the positioning of File elements is syntactically significant:

- Files are assumed to be associated with the Package that immediately precedes it, if a package exists.
- Presence of a new package signals the end of the set of files associated with the original package, unless an explicit Relationship is used.
- If a Package contains files, the File Information section must follow its Package Information section.
- If a File is not part of any package, it must precede any Package section reference in the SPDX document.
- The first field to start off the description of a File must be the File Name in tag:value format.
- File information is associated with the File Name that precedes it.
- Annotations on the file and Relationships from the file may appear after the file information, before the next file or Package section.

Fields:

### 4.1 File Name

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

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

**4.1.3 Cardinality:** Mandatory, one.

**4.1.4 Data Format:** A relative filename with the root of the package archive or directory. In general, every filename is preceded with a “./”, see <http://www.ietf.org/rfc/rfc3986.txt> for syntax.

**4.1.5 Tag:** “FileName:”

**Example:**

FileName: ./package/foo.c

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

**Example:**

```
<File rdf:about="e">
  <fileName> ./package/foo.c</fileName>
</File>
```

### 4.2 File SPDX Identifier

**4.2.1 Purpose:** Uniquely identify any element in an SPDX document which may be referenced by other elements. These may be referenced internally and externally with the addition of the SPDX Document Identifier.

**4.2.2 Intent:** There may be several versions of the same file within an SPDX document. Each element needs to be able to be referred to uniquely so that relationships between elements can be clearly articulated.

**4.2.3 Cardinality:** Mandatory, one.

**4.2.4 DataFormat:** “SPDXRef-[idstring]”

where [idstring] is a unique string containing letters, numbers, “.”, “-”.

**4.2.5 Tag:** “SPDXID:”

**Example:**  
SPDXID: SPDXRef-1

**4.2.6 RDF:** The URI for the element will follow the form: [SpdxDocumentURI]#SPDXRef-[idstring] where [SpdxDocumentURI] is the URI for the SPDX Document containing the element.

**Example using xml:base:**

```
<rdf:RDF xml:base=
"http://acme.com/spdxdocs/acmeproject/v1.2/1BE2A4FF-5F1A-48D3-8483-28A9B0349A1B"
...
<File rdf:ID="SPDXRef-1">
...
</File>
```

**Example using document URI:**

```
<File rdf:about=
"http://acme.com/spdxdocs/acmeproject/v1.2/1BE2A4FF-5F1A-48D3-8483-28A9B0349A1B#SPDXRef-1">
...
</File>
```

## 4.3 File Type

**4.3.1 Purpose:** This field provides information about the type of file identified. File Type is intrinsic to the file, independent of how the file is being used. A file may have more than one file type assigned to it, however 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, target image or binary executable (.o, .a, etc.);
- c) ARCHIVE if the file represents an archive (.tar, .jar, etc.);
- d) APPLICATION if the file is associated with a specific application type (MIME type of application/\*);
- e) AUDIO if the file is associated with an audio file (MIME type of audio/\*, ie. .mp3);
- f) IMAGE if the file is associated with an picture image file (MIME type of image/\*, ie. .jpg, .gif);
- g) TEXT if the file is human readable text file (MIME type of text/\*);
- h) VIDEO if the file is associated with a video file type (MIME type of video/\*);
- i) DOCUMENTATION if the file serves as documentation;

- j) SPDX if the file is an SPDX document;
- k) OTHER if the file doesn't fit into the above categories (generated artifacts, data files, etc.)

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

**4.3.3 Cardinality:** Optional, multiple.

**4.3.4 Data Format:** "SOURCE" | "BINARY" | "ARCHIVE" | "APPLICATION" | "AUDIO" | "IMAGE" | "TEXT" | "VIDEO" | "DOCUMENTATION" | "SPDX" | "OTHER"

**4.3.5 Tag:** "FileType:"

**Example:**

FileType: BINARY

**Example:** (for a README.TXT)

FileType: TEXT

FileType: DOCUMENTATION

**Example** (foo.exe)

FileType: BINARY

FileType: APPLICATION

**4.3.6 RDF: property** spdx:fileType in **class** spdx:File

**Example:**

```
<File rdf:about="file1">
  <fileType rdf:resource="fileType_binary" />
</File>
```

**Example:** (where file2 is a README.TXT)

```
<File rdf:about="file2">
  <fileType rdf:resource="fhttp://spdx.org/rdf/terms#ileType_text" />
  <fileType rdf:resource="fhttp://spdx.org/rdf/terms#ileType_documentation" />
</File>
```

## 4.4 File Checksum

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

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

**4.4.3 Cardinality:** Mandatory, one SHA1, others may be optionally provided.

**4.4.4 Algorithm:** SHA1() is to be used on the file. Other algorithms that can be provided optionally include SHA256(), MD5().

**4.4.5 Data Format:** There are three components, an algorithm identifier (SHA1), a separator

(":") and a 160 bit value represented as 40 lowercase hexadecimal digits. For other algorithms, an appropriate number of hexadecimal digits is expected.

#### 4.4.6 Tag: "FileChecksum:"

**Example:**

FileChecksum: SHA1: d6a770ba38583ed4bb4525bd96e50461655d2758

FileChecksum: MD5: 624c1abb3664f4b35547e7c73864ad24

#### 4.4.7 RDF: property spdx:Checksum in class spdx:File

**Example:**

```
<File rdf:about="">
  <checksum>
    <Checksum>
      <algorithm rdf:resource="http://spdx.org/rdf/terms#checksumAlgorithm_sha1"/>
      <checksumValue>d6a770ba38583ed4bb4525bd96e50461655d2758
    </checksumValue>
  </Checksum>
  <Checksum>
    <algorithm rdf:resource="http://spdx.org/rdf/terms#checksumAlgorithm_md5"/>
    <checksumValue> 624c1abb3664f4b35547e7c73864ad24
    </checksumValue>
  </Checksum>
</checksum>
</File>
```

## 4.5 Concluded License

**4.5.1 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 valid SPDX License Expression as defined in Appendix IV.
- NONE should be used if there is no licensing information from which to conclude a license for the file.
- 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).

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 4.7). With respect to NOASSERTION, a written explanation in the Comments on License field (section 4.7) is preferred.

**4.5.2 Intent:** Here, the intent is for the SPDX file creator to analyze the License Information in file (section 4.6) 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.

**4.5.3 Cardinality:** Mandatory, one.

**4.5.4 Data Format:** <SPDX Licence Expression> | “NONE” | “NOASSERTION”

where:

<SPDX License Expression> is a valid SPDX License Expression as defined in Appendix IV.

**4.5.5 Tag:** “LicenseConcluded:”

**Example:**

LicenseConcluded: LGPL-2.0

**Example:**

LicenseConcluded: (LGPL-2.0 OR LicenseRef-2)

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

**Example:**

```
<File rdf:about="file">
  <licenseConcluded>LGPL-2.0</licenseConcluded>
</File>
```

**Example:**

```
<File rdf:about="">
  <licenseConcluded>
    <DisjunctiveLicenseSet>
      <member rdf:resource="http://spdx.org/licenses/LGPL-2.0"/>
      <member rdf:resource="LicenseRef-2"/>
    </DisjunctiveLicenseSet>
  </licenseConcluded>
</File>
```

## 4.6 License Information in File

**4.6.1 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 top level 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:

- the SPDX License List short form identifier, if the license is on the SPDX License List.
- a reference to the license, denoted by LicenseRef-[idstring], if the license is not on the SPDX License List.
- NONE, if the actual file contains no license information whatsoever.
- 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).

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.

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

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

**4.6.4 Data Format:** <short form identifier in Appendix I> |  
 ["DocumentRef-"[idstring]":"LicenseRef"-[idstring] |  
 | "NONE" | "NOASSERTION"

where:

SPDX "DocumentRef-"[idstring]: is an optional reference to an external  
 document as described in section 2.6  
 [idstring] is a unique string containing letters, numbers, "." or "-"

**4.6.5 Tag:** "LicenseInfoInFile:"

**Example:**

LicenseInfoInFile: GPL-2.0  
 LicenseInfoInFile: LicenseRef-2

**4.6.6 RDF: property** spdx:licenseInfoInFile in **class** spdx:File

**Example:**

```
<File rdf:about="file1">
  <licenseInfoInFile rdf:resource="http://spdx.org/licenses/GPL-2.0" />
  <licenseInfoInFile rdf:resource="LicenseRef-2" />
</File>
```

## 4.7 Comments on License

**4.7.1 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.

**4.7.2 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.

**4.7.3 Cardinality:** Optional, one.

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

**4.7.5 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>

#### 4.7.6 **RDF: property** spdx:licenseComments in **class** spdx:File

**Example:**

```
<File rdf:about="">
  <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>
```

## 4.8 Copyright Text

**4.8.1 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:

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

**4.8.2 Intent:** Record any copyright notice for the package.

**4.8.3 Cardinality:** Mandatory, one.

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

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

**Example:**

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

**4.8.6 RDF: property** spdx:copyrightText in **class** spdx:File

**Example:**

```
<File rdf:about="">
  <copyrightText>
    Copyright 2008-2010 John Smith
  </copyrightText>
</File>
```

## 4.9 Artifact of Project Name

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

**4.9.2 Intent:** To make it easier for recipients of the SPDX file to determine the original source of the identified file. If the project is not described in an SPDX Document, then ArtifactOf can be used.

If the project is described in another SPDX Document, then Relationship should be used.

**4.9.3 Cardinality:** Optional, one or many.

**4.9.4 Data Format:** single line of text. In Tag/value format the ArtifactOfProjectName must precede any optional ArtifactOf optional properties (e.g. ArtifactOfHomePage and ArtifactOfURI).

**4.9.5 Tag:** "ArtifactOfProjectName:"

**Example:**

ArtifactOfProjectName: Jena

**4.9.6 RDF:** property spdx:artifactOf/doap:Project/doap:name

**Example:**

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

## 4.10 Artifact of Project Homepage

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

**4.10.2 Intent:** To make it easier for recipients of the SPDX file to determine the original source of the identified file. If the project is described in another SPDX Document, then Relationship should be used.

**4.10.3 Cardinality:** Optional, one or many.

**4.10.4 Data Format:** uniform resource locator | "UNKNOWN".

In Tag/value format all optional ArtifactOf fields must follow immediately below the ArtifactOfProjectName.

**4.10.5 Tag:** "ArtifactOfProjectHomePage:"

**Example:**

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

**4.10.6 RDF:** spdx:artifactOf/doap:Project/doap:homepage

**Example:**

```
<File>
```

```

    <artifactOf>
      <doap:Project>
        <doap:homepage >http://www.openjena.org/</doap:homepage>
      </doap:Project>
    </artifactOf>
  </File>

```

## 4.11 Artifact of Project Uniform Resource Identifier

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

**4.11.2 Intent:** To make it easier for recipients of the SPDX file to determine the original source of the identified file. If the project is described in another SPDX Document, then Relationship should be used.

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

**4.11.4 Data Format:** uniform resource identifier.

In Tag/value format all optional ArtifactOf fields must follow immediately below the ArtifactOfProjectName.

**4.11.5 Tag:** "ArtifactOfProjectURI:"

**Example:**

**ArtifactOfProjectURI:** http://subversion.apache.org/doap.rdf

**4.11.6 RDF:** spdx:artifactOf/doap

**Example:**

```

<File>
  <artifactOf rdf:resource="http://subversion.apache.org/" />
</File>

```

<!-- Note: within the DOAP file at http://subversion.apache.org/doap.rdf the value "http://subversion.apache.org/" is the URI of the describes resource of type doap:Project ->

## 4.12 File Comment

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

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

**4.12.3 Cardinality:** Optional, one.

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

- 4.12.5 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>`

- 4.12.6 RDF: property** `rdfs:comments` in **class** `spdx:File`

**Example:**`<File rdf:about="">``<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>`

## 4.13 File Notice

- 4.13.1 Purpose:** This field provides a place for the SPDX file creator to record legal notices potentially found in the file. This may or may not include copyright statements.

- 4.13.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with notices that may require additional review or publication as a requirement of distribution.

- 4.13.3 Cardinality:** Optional, one.

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

- 4.13.5 Tag: “FileNotice:”**  
In tag format multiple lines are delimited by `<text> .. </text>`.

**Example:**FileNotice: `<text>`Copyright (c) 2001 Aaron Lehmann [aaroni@vitelus.com](mailto:aaroni@vitelus.com)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

`</text>`

- 4.13.6 RDF: property** `noticeText` in **class** `spdx:File`

**Example:**`<File rdf:about="">`

```
<noticeText>
Copyright (c) 2001 Aaron Lehmann aaroni@vitelus.com
```

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:  
The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

```
</noticeText>
</File>
```

## 4.14 File Contributor

**4.14.1 Purpose:** This field provides a place for the SPDX file creator to record file contributors. Contributors could include names of copyright holders and/or authors who may not be copyright holders, yet contributed to the file content.

**4.14.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with a list of one or more contributors (credits). This is one way of providing acknowledgement to the contributors of a file. This would be useful, for example, if a recipient company wanted to contact copyright holders to inquire about alternate licensing.

**4.14.3 Cardinality:** Optional, one or many.

**4.14.4 Data Format:** free form text on a single line.

**4.14.5 Tag:** "FileContributor:"  
In tag format single line per contributor.

**Example:**

```
FileContributor: Modified by Paul Mundt lethal@linux-sh.org
FileContributor: The Regents of the University of California
FileContributor: IBM Corporation
```

**4.14.6 RDF: property** fileContributor in **class** spdx:File

**Example:**

```
<File rdf:about="">
  <fileContributor> Modified by Paul Mundt lethal@linux-sh.org </fileContributor>
  <fileContributor> The Regents of the University of California </fileContributor>
  <fileContributor> IBM Corporation </fileContributor>
</File>
```

## 4.15 File Dependencies (deprecated)

This field is deprecated in SPDX 2.0 in favor of using Section 8 which provides more granularity about relationships.

**4.15.1 Purpose:** The field provides a place for the SPDX file creator to record a list of other files (referenceable within this SPDX file) which the file is a derivative of and/or depends on for the build (e.g., source file or build script for a binary program or library). The list of files may not necessarily represent the list of all file dependencies, but possibly the ones that impact the licensing and/or may be needed as part of the file distribution obligation.

**4.15.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with file dependency information based on the build system that created the file. These other files may impact the licensing of the file and/or may be required to satisfy the distribution obligation of the file (e.g., source files subject to a copyleft license).

**4.15.3 Cardinality:** Optional, one or many.

**4.15.4 Data Format:** Reference to the file within the SPDX document. For the Tag format, this will be the filename. For the RDF format, it will be a reference to the actual file node.

**4.15.5 Tag:** "FileDependency:"

**Example:**

```
FileDependency:./busybox-1.20.2/shell/match.h
FileDependency:./busybox-1.20.2/shell/match.c
FileDependency:./busybox-1.20.2/shell/ash.c
```

**4.15.6 RDF: property** spdx:fileDependency in **class** spdx:File

**Example:**

```
<File rdf:nodeID="A0">
  <fileName>./package/source1.java</fileName>
</File>

<File rdf:nodeID="A1">
  <fileName>./package/source2.java</fileName>
</File>

<File rdf:nodeID="A3">
  <fileName>./package/source3.java</fileName>
</File>

<File rdf:about="">
  <fileName>./package/mylibrary.jar</fileName>
  <fileDependency rdf:nodeID="A0"/>
  <fileDependency rdf:nodeID="A1"/>
  <fileDependency rdf:nodeID="A2"/>
</File>
```

## 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 License Identifier

**5.1.1 Purpose:** Provide a locally 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 human readable short form license identifier for a license not on the SPDX License List. This identifier should be unique within the SPDX file. In previous versions of SPDX, the references were required to be sequential numbers, but as of version 1.2, creators may specify references that are easier for humans to remember and mentally map.

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

**5.1.4 Data Format:** "LicenseRef-[idstring]"  
where  
[idstring] is a unique string containing letters, numbers, ".", "-" or "+".

**5.1.5 Tag:** "LicenseID:"

**Examples:**

LicenseID: LicenseRef-1  
LicenseID: LicenseRef-Bereware-4.2

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

**Examples:**

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

<ExtractedLicensingInfo rdf:about="licenseRef-Bereware-4.2">
  <licenseID>LicenseRef-Bereware-4.2</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 Identifier Assigned 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 1 (if only short reference to license present in File):**

ExtractedText: `<text>This software is licensed under the Beer License.</text>`

**Example 2 (if indeed full text of license present in File):**

ExtractedText: `<text>"THE WHISKEY-WARE LICENSE": whiskeyfan@example.com 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 bottle of whiskey in return </text>`

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

**Example 1 (if only short reference to license present in File):**

```
<ExtractedLicensingInfo rdf:about="licenseRef-Whiskeyware">
  <licenseId>LicenseRef-Whiskeyware</licenseId>
  <extractedText> This software is licensed under the WHISKEY-WARE
LICENSE.</extractedText>
</ExtractedLicensingInfo>
```

**Example 2 (if indeed full text of license present in File):**

```
<ExtractedLicensingInfo rdf:about="licenseRef-Whiskeyware">
  <licenseId>LicenseRef-Whiskeyware</licenseId>
  <extractedText> ""THE WHISKEY-WARE LICENSE": whiskeyfan@example.com 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 bottle of whiskey in return.
</extractedText>
</ExtractedLicensingInfo>
```

## 5.3 License Name

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

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

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

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

**5.3.5 Tag:** "LicenseName:"

Example:

LicenseName: Beer-Ware License (Version 42)

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

Example:

```
<ExtractedLicensingInfo rdf:about="licenseRef-Berware-42">
  <name>Beer-Ware License (Version 42)</name>
</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 License List, that is referenced by the License Identifier Assigned.

**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 Relationships between SPDX Elements

### 6.1 Relationship

**6.1.1 Purpose:** This field provides information about the relationship between two SPDX elements. For example, you can represent a relationship between two different Files, between a Package and a File, between two Packages, or between one SPDXDocument and another SPDXDocument. The relationships between two elements that are supported are:

| Relationship   | Description   | Example   |
|----------------|---|---|
| DESCRIBES      | Is to be used when SPDXRef-DOCUMENT describes SPDXRef-A       | An SPDX document 'WildFly.spdx' describes package 'WildFly'. Note this is a logical relationship to help organize related items within an SPDX document that is mandatory if more than one package or set of files (not in a package) is present. |
| DESCRIBED_BY   | Is to be used when SPDXRef-A is described by SPDXREF-Document | The package 'WildFly' is described by SPDX document 'Wildfly.spdx'.   |
| CONTAINS       | Is to be used when SPDXRef-A contains SPDXRef-B.              | An ARCHIVE file 'bar.tgz' contains a SOURCE file 'foo.c'.   |
| CONTAINED_BY   | Is to be used when SPDXRef-A is contained by SPDXRef-B.       | A SOURCE file foo.c is contained by ARCHIVE file 'bar.tgz'  |
| GENERATES      | Is to be used when SPDXRef-A generates the SPDXRef-B.         | A SOURCE file 'makefile.mk' generates a BINARY file 'a.out'   |
| GENERATED_FROM | Is to be used when SPDXRef-A was generated from SPDXRef-B.    | A BINARY file 'a.out' has been generated from a SOURCE file 'makefile.mk'.<br><br>A BINARY file 'foolib.a' is generated from a SOURCE file 'bar.c'.   |

|                       |   |  |
|-----------------------|---|--|
| ANCESTOR_OF           | Is to be used when SPDXRef-A is an ancestor (same lineage but pre-dates) SPDXRef-B                    | A SOURCE file 'makefile.mk' is a version of the original ancestor SOURCE file 'makefile2.mk'   |
| DESCENDANT_OF         | Is to be used when SPDXRef-A is a descendant of (same lineage but postdates) SPDXRef-B.               | A SOURCE file 'makefile2.mk' is a descendant of the original SOURCE file 'makefile.mk'   |
| VARIANT_OF            | Is to be used when SPDXRef-A is a variant of (same lineage but not clear which came first) SPDXRef-B. | A SOURCE file 'makefile2.mk' is a variant of SOURCE file 'makefile.mk' if they differ by some edit, but there is no way to tell which came first (no reliable date information). |
| DISTRIBUTION_ARTIFACT | Is to be used when distributing SPDXRef-A requires that SPDXRef-B also be distributed.                | A BINARY file 'foo.o' requires that the ARCHIVE file 'bar-sources.tgz' be made available on distribution.  |
| PATCH_FOR             | Is to be used when SPDXRef-A is a patch file for (to be applied to) SPDXRef-B.                        | A SOURCE file 'foo.diff' is a patch file for SOURCE file 'foo.c'.  |
| PATCH_APPLIED         | Is to be used when SPDXRef-A is a patch file that has been applied to SPDXRef-B.                      | A SOURCE file 'foo.diff' is a patch file that has been applied to SOURCE file 'foo-patched.c'.   |
| COPY_OF               | Is to be used when SPDXRef-A is an exact copy of SPDXRef-B.   | A BINARY file 'alib.a' is an exact copy of BINARY file 'a2lib.a'.  |
| FILE_ADDED            | Is to be used when SPDXRef-A is a file added to SPDXRef-B.  | A SOURCE file 'foo.c' has been added to package ARCHIVE 'bar.tgz'.   |
| FILE_DELETED          | Is to be used when SPDXRef-A is a file was deleted from to SPDXRef-B.                                 | A SOURCE file 'foo.diff' has been deleted from package ARCHIVE 'bar.tgz'.  |
| FILE_MODIFIED         | Is to be used when SPDXRef-A is a file that was modified from SPDXRef-B.                              | A SOURCE file 'foo.c' has been modified from SOURCE file 'foo.orig.c'.   |

|                       |   |   |
|-----------------------|---|---|
| EXPANDED_FROM_ARCHIVE | Is to be used when SPDXRef-A is expanded from the archive SPDXRef-B.      | A SOURCE file 'foo.c', has been expanded from the archive ARCHIVE file 'xyz.tgz'.   |
| DYNAMIC_LINK          | Is to be used when SPDXRef-A dynamically links to SPDXRef-B.              | An APPLICATION file 'myapp' dynamically links to BINARY file 'zlib.so'.   |
| STATIC_LINK           | Is to be used when SPDXRef-A statically links to SPDXRef-B.               | An APPLICATION file 'myapp' statically links to BINARY 'zlib.a'.  |
| DATA_FILE_OF          | Is to be used when SPDXRef-A is a data file used in SPDXRef-B.            | An IMAGE file 'kitty.jpg' is a data file of an APPLICATION 'hellokitty'.  |
| TEST_CASE_OF          | Is to be used when SPDXRef-A is a test case used in testing SPDXRef-B.    | A SOURCE file testMyCode.java is a unit test file used to test an APPLICATION MyPackage.  |
| BUILD_TOOL_OF         | Is to be used when SPDXRef-A is used to build SPDXRef-B.                  | A SOURCE file 'makefile.mk' is used to build an APPLICATION 'zlib'.   |
| DOCUMENTATION_OF      | Is to be used when SPDXRef-A provides documentation of SPDXRef-B.         | A DOCUMENTATION file 'readme.txt' documents the APPLICATION 'zlib'.   |
| OPTIONAL_COMPONENT_OF | Is to be used when SPDXRef-A is an optional component of SPDXRef-B.       | A SOURCE file 'foo.c' (which is in the contributors directory) may or may not be included in the build of APPLICATION 'atthebar'.   |
| METAFILE_OF           | Is to be used when SPDXRef-A is a metafile of SPDXRef-B.                  | A SOURCE file 'pom.xml' is a metafile of the APPLICATION 'Apache Xerces'.   |
| PACKAGE_OF            | Is to be used when SPDXRef-A is used as a package as part of SPDXRef-B.   | A Linux distribution contains an APPLICATION package gawk as part of the distribution MyLinuxDistro.                                |
| AMENDS                | Is to be used when (current) SPDXRef-DOCUMENT amends the SPDX information | (Current) SPDX document A version 2 contains a correction to a previous version of the SPDX document A version 1. Note the reserved |

|                  |  |   |
|------------------|--|---|
|                  | in SPDXRef-B.  | identifier SPDXRef-DOCUMENT for the current document is required. |
| PREREQUISITE_FOR | Is to be used when SPDXRef-A is a prerequisite for SPDXRef-B   | A library 'bar.dll' is a prerequisite for APPLICATION 'foo.exe'   |
| HAS_PREREQUISITE | Is to be used when SPDXRef-A has as a prerequisite SPDXRef-B   | An APPLICATION 'foo.exe' has prerequisite 'bar.dll'               |
| OTHER            | Is to be used for a relationship which has not been defined in the formal SPDX specification. A description of the relationship should be included in the Relationship comments field. |   |

**6.1.2** Intent: Here, this field is a reasonable estimation of the relation between two identified elements (i.e. files or packages, or documents), from a developer perspective.

**6.1.3** Cardinality: Optional, multiple.

**6.1.4 Data Format:**

["DocumentRef-"[idstring]":"]SPDXID <relationship> ["DocumentRef-"[idstring]":"]SPDXID  
 where DocumentRef-[idstring]: is an optional reference to an external SPDX document as described in section 2.6  
 where SPDXID is a string containing letters, numbers, ".", "-", as described in sections (2.3, 3.2, 4.2).  
 where <relationship> is one of the documented relationship types in table 6.1.1.

**6.1.5** Tag: "Relationship:"

**Examples:**

Relationship: SPDXRef-grep CONTAINS SPDXRef-make  
 RelationshipComment: Package grep contains file make

Relationship: SPDXRef-DOCUMENT AMENDS DocumentRef-SPDXA:SPDXRef-DOCUMENT  
 RelationshipComment: This current document is an amendment of the SPDXA document.

**6.1.6** RDF: property relationship in any SpdxElement

**Examples:**

<SpdxElement rdf:about="#SPDXRef-45">

```

    <relationship>
      <Relationship>
        <spdx:relatedSpdxElement>
          <spdx:SpdxElement rdf:about="http://spdx.org/spdxdocs/spdx-tools-v1.2-3F2504E0-4F89-
          41D3-9A0C-0305E82C3301#SPDXRef-ToolsElement"/>
        </spdx:relatedSpdxElement>

    <relationshipType>http://spdx.org/rdf/terms#relationshipType_contains</relationshipType>
      </Relationship>
    </relationship>
    ...
  </SpdxElement>

```

## 6.2 Relationship Comment

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

**6.2.2 Intent:** Here, the intent is to provide the recipient of the SPDX file with more information determined after careful analysis of the relationship between two elements in an SPDX file.

**6.2.3 Cardinality:** Optional, one.

**6.2.4 Data Format:** free form text that can span multiple lines, refers only to the immediately preceding relationship.

**6.2.5 Tag:** "RelationshipComment:"  
 In tag format multiple lines are delimited by <text> .. </text>.  
 A RelationshipComment: must be the line immediately after a "Relationship:"

**Example:**

```

RelationshipComment: <text>
The package foo.tgz is a pre-requisite for building executable bar.
</text>

```

**6.2.6 RDF:** property rdfs:comments in class spdx:Relationship

**Example:**

```

<Relationship rdf:about="">
  <rdfs:comment>
    The package foo.tgz is a pre-requisite for building executable bar.
  </rdfs:comment>
  ...
</Relationship>

```



## 7 Annotations

### 7.1 Annotator

**7.1.1 Purpose:** This field identifies the person, organization or tool that has commented on a file, package, or the entire document.

**7.1.2 Intent:** It may also be important for participants in the software supply chain to validate and add information on ambiguous files, and packages.

**7.1.3 Cardinality:** Conditional (Mandatory, one), if there is an Annotation.

**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:** "Annotator:"

**Example:**

Annotator: Person: Jane Doe ()

**7.1.6 RDF: property** spdx:annotator in **class** spdx:Annotation

**Example:**

```
<Annotation>
  <annotator> Person: Jane Doe () </annotator>
</Annotations>
```

### 7.2 Annotation Date

**7.2.1 Purpose:** Identify when the comment was made. 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 Annotation Date can serve as a verification as to when the actual review was done.

**7.2.3 Cardinality:** Conditional (Mandatory, one), if there is an Annotation.

**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  
**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:** "AnnotationDate:"

**Example:**

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

**7.2.6 RDF: property** spdx:annotationDate in **class** spdx:Annotation

**Example:**

```
</Annotation>
  <annotationDate> 2010-01-29T18:30:22Z </annotation Date>
</Annotation>
```

## 7.3 Annotation Type

**7.3.1 Purpose:** This field describes the type of annotation.

**7.3.2 Intent:** This allows the type of annotation to be recorded.

**7.3.3 Cardinality:** Conditional (Mandatory, one), if there is an Annotation.

**7.3.4 Data Format:** "REVIEW" | "OTHER"

**7.3.5 Tag:** "AnnotationType:"

**Example:**

AnnotationType: REVIEW

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

**Example:**

```
<Annotation>
  <spdx:annotationType rdf:resource="http://spdx.org/rdf/terms#annotationType_other"/>
</Annotation>
```

## 7.4 SPDX Identifier Reference

**7.4.1 Purpose:** Uniquely identify the element in an SPDX document which is being referenced. These may be referenced internally and externally with the addition of the SPDX Document Identifier.

**7.4.2 Intent:** There may be several versions of the same package or file within an SPDX document. Each element needs to be able to be referred to uniquely so that relationships between elements can be clearly articulated.

**7.4.3 Cardinality:** Conditional (Mandatory, one), if there is an Annotation.

**7.4.4 DataFormat:** ["DocumentRef-"[idstring]":"]SPDXID

where:

- [“DocumentRef-”[idstring]”.:”] is an optional reference to an external SPDX document as described in section 2.6
- SPDXID is a unique string containing letters, numbers, “.”,“-” as described in Sections 2.3, 3.2 and 4.2.

#### 7.4.5 Tag: “SPDXREF:”

**Example:**

SPDXREF: SPDXRef-45

Example:

SPDXREF: DocumentRef-spx-tool-1.2:SPDXRef-5

#### 7.4.6 RDF:

**For RDF, the annotations are a property of the SPDX element it is annotating.**

```
<SpxElement rdf:about="#SPDXRef-45">
  <annotation>
    <Annotation>
      ...
    </Annotation>
  </annotation>
</SpxElement rdf:about="#SPDXRef-45">
```

## 7.5 Annotation Comment

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

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

**7.5.3 Cardinality:** Conditional (Mandatory, one), if there is an Annotation.

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

**7.5.5 Tag:** “AnnotationComment:”  
In tag format multiple lines are delimited by <text> .. </text>.

**Example:**

AnnotationComment: <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>

**7.5.6 RDF:** property rdfs:comment in class spdx:Annotation

**Example:**

<Annotation>

```
<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>  
</Annotation >
```

## 8 Review Information (deprecated)

The review information section is included for compatibility with SPDX 1.2, and is deprecated in SPDX 2.0. Any review information should use an Annotation (as described in Section 7) with an annotation type of `annotationType_review`.

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:

### 8.1 Reviewer (deprecated)

This field is deprecated in SPDX 2.0.

**8.1.1 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.

**8.1.2 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.

**8.1.3 Cardinality:** Optional, one.

**8.1.4 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"

**8.1.5 Tag:** "Reviewer:"

**Example:**

Reviewer: Person: Jane Doe ()

**8.1.6 RDF: property** `spdx:reviewer` in **class** `spdx:Review`

**Example:**

```
<Review>
  <reviewer> Person: Jane Doe () </reviewer>
</Review>
```

## 8.2 Review Date (deprecated)

This field is deprecated in SPDX 2.0.

**8.2.1 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.

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

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

**8.2.4 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

**8.2.5 Tag:** "ReviewDate:"

**Example:**

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

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

**Example:**

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

## 8.3 Review Comment (deprecated)

This field is deprecated in SPDX 2.0.

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

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

**8.3.3 Cardinality:** Optional, one.

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

**8.3.5 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>

**8.3.6 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: SPDX License List

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

- **[License Exceptions](#)**: The list of commonly found exceptions to open source licenses, which can be used with the [License Expression Syntax](#) operator, "WITH" to create a license with an exception.
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| Yahoo! Public License v1.0               | <a href="#">YPL-1.0</a>              |
| Yahoo! Public License v1.1               | <a href="#">YPL-1.1</a>              |
| Zed License                              | <a href="#">Zed</a>                  |
| Zend License v2.0                        | <a href="#">Zend-2.0</a>             |
| Zimbra Public License v1.3               | <a href="#">Zimbra-1.3</a>           |
| Zimbra Public License v1.4               | <a href="#">Zimbra-1.4</a>           |
| zlib License                             | <a href="#">Zlib</a>                 |
| zlib/libpng License with Acknowledgement | <a href="#">zlib-acknowledgement</a> |
| Zope Public License 1.1                  | <a href="#">ZPL-1.1</a>              |
| Zope Public License 2.0                  | <a href="#">ZPL-2.0</a>              |
| Zope Public License 2.1                  | <a href="#">ZPL-2.1</a>              |

## I.2 Exceptions List

| Full Name of Exception  | SPDX License Exception                  |
|-------------------------|---|
| Autoconf exception 2.0  | <a href="#">Autoconf-exception-2.0</a>  |
| Autoconf exception 3.0  | <a href="#">Autoconf-exception-3.0</a>  |
| Bison exception 2.2     | <a href="#">Bison-exception-2.2</a>     |
| Classpath exception 2.0 | <a href="#">Classpath-exception-2.0</a> |
| eCos exception 2.0      | <a href="#">eCos-exception-2.0</a>      |

|                                   |   |
|-----------------------------------|---|
| Font exception 2.0                | <a href="#">Font-exception-2.0</a>      |
| GCC Runtime Library exception 2.0 | <a href="#">GCC-exception-2.0</a>       |
| GCC Runtime Library exception 3.1 | <a href="#">GCC-exception-3.1</a>       |
| WxWindows Library Exception 3.1   | <a href="#">WxWindows-exception-3.1</a> |

### I.3 Deprecated Licenses

| Full Name of License  | Deprecated SPDX License Identifier               |
|---|--|
| eCos license version 2.0  | <a href="#">eCos-2.0</a>                         |
| GNU General Public License v1.0 or later                        | <a href="#">GPL-1.0+</a>                         |
| GNU General Public License v2.0 or later                        | <a href="#">GPL-2.0+</a>                         |
| GNU General Public License v2.0 w/Autoconf exception            | <a href="#">GPL-2.0-with-autoconf-exception</a>  |
| GNU General Public License v2.0 w/Bison exception               | <a href="#">GPL-2.0-with-bison-exception</a>     |
| GNU General Public License v2.0 w/Classpath exception           | <a href="#">GPL-2.0-with-classpath-exception</a> |
| GNU General Public License v2.0 w/Font exception                | <a href="#">GPL-2.0-with-font-exception</a>      |
| GNU General Public License v2.0 w/GCC Runtime Library exception | <a href="#">GPL-2.0-with-GCC-exception</a>       |
| GNU General Public License v3.0 or later                        | <a href="#">GPL-3.0+</a>                         |
| GNU General Public License v3.0 w/Autoconf exception            | <a href="#">GPL-3.0-with-autoconf-exception</a>  |
| GNU General Public License v3.0 w/GCC Runtime Library exception | <a href="#">GPL-3.0-with-GCC-exception</a>       |
| GNU Lesser General Public License v2.1 or later                 | <a href="#">LGPL-2.1+</a>                        |
| GNU Lesser General Public License v3.0 or later                 | <a href="#">LGPL-3.0+</a>                        |
| GNU Library General Public License v2 or later                  | <a href="#">LGPL-2.0+</a>                        |
| Standard ML of New Jersey License                               | <a href="#">StandardML-NJ</a>                    |
| wxWindows Library License                                       | <a href="#">WXwindows</a>                        |

## Appendix II: License Matching Guidelines and Templates

The [SPDX License List Matching Guidelines](#) provide guidelines to be used for the purposes of matching licenses and license exceptions against those found on the SPDX License List. There is no intent here to make a judgment or interpretation, but merely to ensure that when one SPDX creator identifies a license as “BSD 3-clause,” for example, it is indeed the same license as what someone else identifies as “BSD 3-clause” and the same license as what is listed on the SPDX License List. Examples of how to apply some of the matching guidelines to a license or exception are provided via templates. Templates are comprised of technical markup within the master license text file to provide further or specific guidance to SPDX document creators or tool makers. Not all licenses or exceptions will have templates with markups.

### SPDX License List Template Access

The master files for the SPDX License List includes a spreadsheet listing all the licenses, deprecated licenses, and license exceptions; and the text for each license in a .txt file. These files are available in a [Git repository](#). Text that can be considered replaceable or omissible for matching purposes is indicated in the .txt file with markup as per the description below.

RDFa Access: The template text for the license can be accessed using the RDF tag `licenseTemplate` on the web page containing the license.

### Template Format

A template is composed of text with zero or more rules embedded in it.

A rule is a variable section of a license wrapped between double angle brackets “<<>>” and is composed of 4 fields. Each field is separated with a semi-colon “;”. Rules cannot be embedded within other rules. Rule fields begin with a case sensitive tag followed by an equal sign “=”.

Rule fields:

- **type:** indicates whether the text is replaceable or omissible as [per Matching Guideline #2](#) (“Substantive Text”).
  - Indicated by <<var; . . . >> or...
  - Indicated by <<beginOptional; . . . >> and <<endOptional>> respectively.
  - This field is the first field and is required.
- **name:** name of the field in the template.
  - This field is unique within each license template.
  - This field is required.
- **original:** the original text of the rule.
  - This field is required for a rule type: <<var; . . . >>
- **match:** a [POSIX extended regular expression \(ERE\)](#).
  - This field is required for a rule type: <<var; . . . >>

The [POSIX ERE](#) in the match field has the following restrictions and extensions:

Semicolons are escaped with \;

POSIX Bracket Extensions are not allowed

Example:

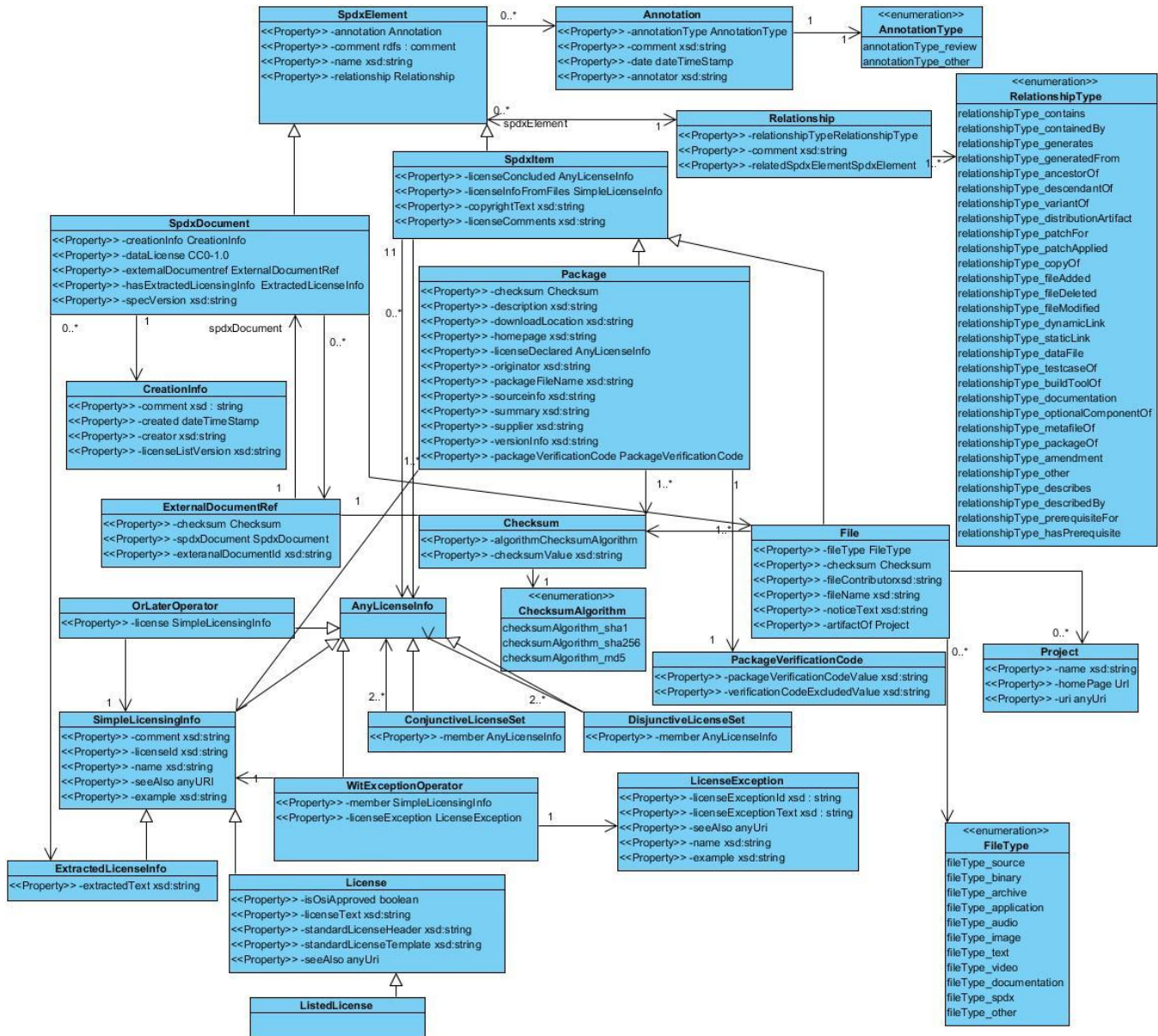
```
<<var;name=organizationClause3;original=the copyright holder;match=.+>>
```

## Appendix III: RDF Data Model Implementation and Identifier Syntax

### SPDX® Vocabulary Specification

See: <http://spdx.org/rdf/ontology/spdx-2-0>

Version: 2.0



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## Agent and Tool Identifiers

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

```

agent           = person / organization
tool           = "Tool: " name 0*1( " " DASH " " version)

person         = "Person: " name 0*1contact-info
organization   = "Organization: " name 0*1contact-info

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

version       = 1*VCHAR-SANS-QUOTE

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

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

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

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

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

```



## Appendix IV: SPDX License Expressions

### Overview

Often a single license can be used to represent the licensing terms of a source code or binary file, but there are situations where a single license identifier is not sufficient. A common example is when software is offered under a choice of one or more licenses (e.g., GPL-2.0 OR BSD-3-Clause). Another example is when a set of licenses is needed to represent a binary program constructed by compiling and linking two (or more) different source files each governed by different licenses (e.g., LGPL-2.1 AND BSD-3-Clause).

SPDX License Expressions provides a way for one to construct expressions that more accurately represent the licensing terms typically found in open source software source code. A license expression could simple be a single license identifier found on the SPDX license list; a user defined license reference denoted by the LicenseRef-{idString}; a license identifier combined with a SPDX defined exception; or some combination of license identifiers, license references and exceptions constructed using a small set of defined operators (e.g., AND, OR, WITH and +). We provide the definition of what constitutes a valid an SPDX License Expression in this section.

The exact syntax of license expressions is described below in [ABNF](#).

```

idstring           = 1*(ALPHA / DIGIT / "-" / "." )
license-id        = <short form license identifier in Appendix I.1>
license-exception-id = <short form license exception identifier in Appendix I.2>
license-ref       = ["DocumentRef-"1*(idstring) ":" ]"LicenseRef-"1*(idstring)

simple-expression = license-id / license-id"+" / license-ref
compound-expression = 1*(simple-expression /
    simple-expression "WITH" license-exception-id /
    compound-expression "AND" compound-expression /
    compound-expression "OR" compound-expression ) /
    "(" compound-expression ")" )

license-expression = 1*1(simple-expression / compound-expression)

```

In the following sections we describe in more detail **<license-expression>** construct, a licensing expression string that enables a more accurate representation of the licensing terms of modern day software.

A valid **<license-expression>** string consists of either:

- (i) a simple license expression, such as a single license identifier; or
- (ii) a more complex expression constructed by combining smaller valid expressions using Boolean license operators.

## Simple License Expressions

A simple `<license-expression>` is composed one of the following:

- An **SPDX License List Short Form Identifier**. For example: `GPL-2.0`
- An **SPDX License List Short Form Identifier** with a unary "+" operator suffix to represent the current version of the license or any later version. For example: `GPL-2.0+`
- A SPDX user defined license reference: `["DocumentRef-"1*(idstring) ":" ] "LicenseRef-"1*(idstring)`

Some examples:

```
LicenseRef-23
LicenseRef-MIT-Style-1
DocumentRef-spdx-tool-1.2:LicenseRef-MIT-Style-2
```

## Composite License Expressions

More expressive composite license expressions can be constructed using "OR", "AND", and "WITH" operators similar to constructing mathematical expressions using arithmetic operators. For the tag/value format, any license expression that consists of more than one license identifier and/or LicenseRef, should be encapsulated by parentheses: " ( ) ". This has been specified to facilitate expression parsing. Nested parentheses can also be used to specify an order of precedence which is discussed in more detail in subsection (4).

### 1) Disjunctive "OR" Operator

If presented with a choice between two or more licenses, use the disjunctive binary "OR" operator to construct a new license expression, where both the left and right operands are valid license expression values.

For example, when given a choice between the LGPL-2.1 or MIT licenses, a valid expression would be:

```
(LGPL-2.1 OR MIT)
```

An example representing a choice between three different licenses would be:

```
(LGPL-2.1 OR MIT OR BSD-3-Clause)
```

### 2) Conjunctive "AND" Operator

If required to simultaneously comply with two or more licenses, use the conjunctive binary "AND" operator to construct a new license expression, where both the left and right operands are a valid license expression values.

For example, when one is required to comply with both the LGPL-2.1 or MIT licenses, a valid expression would be:

```
(LGPL-2.1 AND MIT)
```

An example where all three different licenses apply would be:

```
(LGPL-2.1 AND MIT AND BSD-2-Clause)
```

### 3) Exception "WITH" Operator

Sometimes a set of license terms apply except under special circumstances. In this case, use the binary "WITH" operator to construct a new license expression to represent the special exception situation. A

valid **<license-expression>** is where the left operand is a **<simple-expression>** value and the right operand is a **<license-exception-id>** that represents the special exception terms.

For example, when the Bison exception is to be applied to GPL-2.0+, the expression would be:

```
(GPL-2.0+ WITH Bison-exception-2.2)
```

The current set of valid exceptions can be found in Appendix I, section 2. For the most up to date set of exceptions please see [spdx.org/licenses](http://spdx.org/licenses). If the applicable exception is not found on the SPDX License Exception List, then use a single **<license-ref>** to represent the entire license terms (including the exception).

#### 4) Order of Precedence and Parentheses

The order of application of the operators in an expression matters (similar to mathematical operators). The default operator order of precedence of a **<license-expression>** is:

1. +
2. WITH
3. AND
4. OR

where a lower order operator is applied before a higher order operator.

For example, the following expression: LGPL-2.1 OR BSD-3-Clause AND MIT represents a license choice between either LGPL-2.1 and the expression BSD-3-Clause AND MIT because the AND operator takes precedence over (is applied before) the OR operator.

When required to express an order of precedence that is different from the default order a **<license-expression>** can be encapsulated in pairs of parentheses: ( ), to indicate that the operators found inside the parentheses takes precedence over operators outside. This is also similar to the use of parentheses in an algebraic expression e.g., (5+7)/2.

For instance, the following expression: (MIT AND (LGPL-2.1+ OR BSD-3-Clause)) states the OR operator should be applied before the AND operator. That is, one should first select between the LGPL-2.1+ or the BSD-3-Clause license before applying the MIT license.

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