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**The 'XML2RFC' version 3 Vocabulary  
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Abstract

This document defines the 'XML2RFC' version 3 vocabulary; an XML-based language used for writing RFCs and Internet-Drafts. It is heavily derived from the version 2 vocabulary that is also under discussion.

Editorial Note (To be removed by RFC Editor)

Discussion of this draft takes place on the rfc-interest mailing list ([rfc-interest@rfc-editor.org](mailto:rfc-interest@rfc-editor.org)), which has its home page at [<https://www.rfc-editor.org/mailman/listinfo/rfc-interest>](https://www.rfc-editor.org/mailman/listinfo/rfc-interest).

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## **1. Introduction**

This document describes version 3 ('v3') of the 'XML2RFC' vocabulary; an XML-based language ('Extensible Markup Language', [[XML](#)]) used for writing RFCs ([[RFCSTYLE](#)]) and Internet-Drafts ([[IDGUIDE](#)]).

This document obsoletes the version ("v2") vocabulary [[XML2RFCv2](#)], which contains the extended language definition. That document in turn obsoletes the original version ("v1") [[RFC2629](#)]. This document directly copies the material from [[XML2RFCv2](#)] where possible; as that document makes its way toward RFC publication, this document will incorporate as many of the changes as possible.

Note that the vocabulary contains certain constructs that might not be used when generating the final text; however, they can provide useful data for other uses (such index generation, populating a keyword database, or syntax checks).

### **1.1. Differences from v2 to v3**

The following is a hopefully-complete list of all the technical changes between [[XML2RFCv2](#)] and this document. Note that the list is for the current version of this document only. There are additional changes that are expected to the v3 vocabulary that are being discussed. Also note that changes to the design choices for the differences are also expected.

The design criteria of the changes from v2 to v3 are:

- o The intention is that starting and editing a v3 document will be easier than for a v2 document.
- o There will be good v2-to-v3 conversion tools for when an author wants to change versions.
- o There are no current plans to make v3 XML the required submission format for drafts or RFCs. That might happen eventually, but it is likely to be years away.

There is a desire to keep as much of the v2 grammar as makes sense within the above design criteria and not to make gratuitous changes to the v2 grammar. Another way to say this is "we would rather encourage backward compatibility but not be constrained by it". Still, the goal of starting and editing a v3 document being easier than for a v2 document is more important than backwards compatibility with v2, given the latter two design criteria.

v3 is upwards compatible with v2, meaning that a v2 document is meant



to be a valid v3 document as well. However, some features of v2 are deprecated in v3 in favor of new elements. Deprecated features are described in [[XML2RFCv2](#)].

The canonical RFCs will not have any markup that uses a deprecated feature. The RFC Editor's processor will have a "convert with warnings" mode that will convert a v2 document to a v3 document that converts deprecated features wherever possible, issuing warnings for where it cannot convert. The processor will also have a "strict" mode that will issue errors if any deprecated features are in the input.

The list of changes so far is:

- o Did not generate the grammar from a DTD, but instead directly from the RNG grammar.
- o In <address>, allowed the sub-elements to be in any order.
- o In <artwork> and <author>, added optional "xml:lang" attribute.
- o Allowed <artwork> to be in a <section>, not just a figure.
- o Deprecated "xml:space" in <artwork> because there was only one useful value.
- o Gave more specifics of handling the "type" attribute in <artwork>.
- o Added the <b>, <i>, and <tt> elements.
- o Added the <blockquote> element.
- o Allowed <b>, <eref>, <i>, <tt>, and <xref> in <cref>.
- o Deprecated <facsimile> because it is rarely used and is not actually useful.
- o Deprecated the "alt", "height", "src", and "width" attributes in <figure> because they overlap with the attributes in <artwork>.
- o Allowed more than one <artwork> in <figure>.
- o In <front>, made <date> optional.
- o Added <innerRefContent> to allow better control of text in a reference.





- o Deprecated `<format>` because it is not useful and has caused surprise for authors in the past.
- o Deprecated `<list>` in favor of `<dl>`, `<ul>`, and `<ol>`.
- o In `<postal>`, allowed the sub-elements to be in any order. Also allowed the inclusion of `<postalline>` instead of the older elements.
- o Added `<postalline>`, free text that represents one line of the address.
- o Changed the handling of `<reference>`. This large change is described in [Section 1.1.1](#).
- o Allowed the elements inside a `<reference>` to be in any order.
- o In `<section>`, added the optional "numbered" and "removeinrfc" attributes.
- o Deprecated `<spanx>` element, and replaced it with `<b>`, `<i>`, and `<tt>`.
- o Added the `<tindent>` element for indented paragraphs.
- o In `<ttcol>`, added `<xref>`, `<eref>`, `<iref>`, and `<cref>` as optional children.
- o Deprecated `<vspace>` because the v2 spec labeled it as "a purely presentational element and thus its use ought to be avoided".
- o Deprecated the "pageno" attribute in `<xref>` because it was unused in v2.
- o Added the "section" attribute in `<xref>`.
- o Added "ascii" attributes to `<author>`, `<email>`, and `<organization>` elements. This allows an author to specify their information in their native scripts as the primary entry and still allow the ASCII-equivalent values to appear in the processed documents.

#### **[1.1.1](#). Design for Changes in Reference Handling**

This section describes one of the larger changes in the design of v3, namely the additions to make using references easier. Most references in most recent RFCs are just to RFCs; sometimes they are Internet Drafts as work-in-progress; much less often they are pointers to standards of other SDOs, research articles, or just plain



URLs. There have been many complaints about how difficult it is for people who don't have strong XML skills to use references when making Internet Drafts.

The two popular methods now for references to RFCs are entering the whole reference by hand (hopefully getting all the fiddly bits of `<front>` and `<seriesInfo>` correct), or using XML entities that call out the `xml.resource.org`. Both work, but both have their faults. The first requires good copying skills and sometimes causes difficult XML errors; the second prevents you from changing the anchor name and, less importantly, also requires that you be online when you run the `xml2rfc` processor.

To make entering references easier for the vast majority of cases, the following changes have been made in the v3 vocabulary:

- o The `<reference>` element can take another optional pair of attributes: "series" and "document". For example, the value for "series" would be "rfc", "fyi", "id", "bcp", and "std" for IETF-controlled documents; there would be many series for non-IETF documents as well. The value for "document" depends on the series, as described in `<reference>`.
- o The processor would emit a properly-formatted output for the reference in the non-canonical display formats based on rules built into the processor and data for the references. The library used for expansion of the references will be maintained by the RFC Editor.
- o Thus, the contents of `<reference>` changes from requiring a `<front>` element to making the `<front>` element optional if a "series" is given.

## **1.2. Syntax Notation**

The XML vocabulary here is defined in prose, based on the Relax NG schema ([\[RNC\]](#)) contained in [Appendix B](#) (specified in Relax NG Compact Notation, "RNC").

Note that the schema can be used for automated validity checks, but certain constraints are only described in prose (example: the conditionally required presence of the "abbrev" attribute).

## **2. Elements**

The sections below describe all elements and their attributes.

Note that attributes not labeled "mandatory" are optional.



Many elements have an optional "anchor" attribute. In all cases, The value of the "anchor" attribute needs to be a valid XML "Name" (Section 2.3 of [\[XML\]](#)). In short, it is a text string with no spaces or colons; hyphens and underscores are allowed.

### **[2.1.](#) <abstract>**

Contains the abstract of the document. The abstract ought to be self-contained and thus should not contain references or unexpanded abbreviations. See [\[RFCSTYLE\]](#) for more information.

This element appears as child element of: <front> ([Section 2.24](#)).

Content model:

One or more <t> elements ([Section 2.48](#))

### **[2.2.](#) <address>**

Provides address information for the author.

This element appears as child element of: <author> ([Section 2.6](#)).

Content model:

In any order:

- o <postal> elements ([Section 2.36](#))
- o <phone> elements ([Section 2.35](#))
- o <facsimile> elements ([Section 2.21](#))
- o <email> elements ([Section 2.19](#))
- o <uri> elements ([Section 2.55](#))

### **[2.3.](#) <annotation>**

Provides additional prose augmenting a bibliographical reference.



For instance:

```
<annotation>
  Latest version available at <eref
    target='http://www.w3.org/TR/xml1'/>.
</annotation>
```

...will generate the text used in the reference for [[XML](#)].

This element appears as child element of: <reference> ([Section 2.40](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <spanx> elements ([Section 2.46](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

#### **[2.4.](#) <area>**

Provides information about the IETF area this document applies to (currently not used when generating documents).

The value ought to be either the fullname or the abbreviation of one of the IETF areas as listed on <http://www.ietf.org/iesg/area.html>: "Applications", "app", "General", "gen", "Internet", "int", "Operations and Management", "ops", "Real-time Applications and Infrastructure", "rai", "Routing", "rtg", "Security", "sec", "Transport", "tsv".

This element appears as child element of: <front> ([Section 2.24](#)).

Content model: only text content.





## **2.5. <artwork>**

This element allows the inclusion of "artwork" into the document.

<artwork> provides full control of horizontal whitespace and line breaks, and thus is used for a variety of things, such as:

- o diagrams ("line art"),
- o source code,
- o formal languages (such as ABNF or the RNC notation used in this document),
- o complex tables, or
- o protocol unit diagrams.

Alternatively, the "src" attribute allows referencing an external graphics file, such as a bitmap or a vector drawing. In this case, the textual content acts as fallback for output formats that do not support graphics, and thus ought to contain either a "line art" variant of the graphics, or otherwise prose that describes the included image in sufficient detail. Note that RFCs occasionally are published with enhanced diagrams; a recent example is [[RFC5598](#)].

This element appears as child element of: <blockquote> ([Section 2.9](#)), <dd> ([Section 2.16](#)), <figure> ([Section 2.22](#)), <li> ([Section 2.29](#)), <section> ([Section 2.44](#)), <t> ([Section 2.48](#)), and <tindent> ([Section 2.50](#)).

Content model:

Text

### **2.5.1. 'align' attribute**

Controls whether the artwork appears left (default), centered, or right.

Allowed values:

- o "left" (default)
- o "center"
- o "right"



### [2.5.2.](#) 'alt' attribute

Alternative text description of the artwork (not just the caption).

### [2.5.3.](#) 'height' attribute

The suggested height of the graphics included using the "src" attribute.

This attribute is format-dependent and ought to be avoided.

When generating HTML output, current implementations copy the attribute "as is". For other output formats it is usually ignored.

### [2.5.4.](#) 'name' attribute

A filename suitable for the contents (such as for extraction to a local file).

This attribute generally isn't used for document generation, but it can be helpful for other kinds of tools (such as automated syntax checkers which work by extracting the source code).

### [2.5.5.](#) 'src' attribute

The URI of a graphics file.

Note that this can be a "data" URI ([\[RFC2397\]](#)) as well, in which case the graphics file essentially is in-lined.

### [2.5.6.](#) 'type' attribute

Specifies the type of the artwork. The value of this attribute is free text with certain values designated as preferred. A processor might add type-specific formatting to artwork with the preferred values in the non-canonical output formats. If the processor encounters a value for "type" that is not one of the preferred values, it can issue a warning.

The beginning list of preferred values are:

- o abnf
- o ascii-art
- o asn.1



- o bash
- o c++
- o c
- o call-flow
- o hex-dump
- o mib
- o perl
- o python

The RFC Editor will maintain a complete list of the preferred values on its web site, and that list is expected to be updated over time. Thus, a consumer of v3 XML should not cause a failure when it encounters an unexpected type.

#### [2.5.7.](#) 'width' attribute

The suggested width of the graphics included using the "src" attribute.

This attribute is format-dependent and ought to be avoided.

When generating HTML output, current implementations copy the attribute "as is". For other output formats it is usually ignored.

#### [2.5.8.](#) 'xml:lang' attribute

Allows specification of the language used. This is sometimes useful for renderers which display different fonts for CJK characters.

#### [2.5.9.](#) 'xml:space' attribute

Deprecated.

### [2.6.](#) <author>

Provides information about a document author.

The <author> elements contained within the document's <front> element are used to fill the boilerplate, and also to generate the "Author's Address" section (see [[RFCSTYLE](#)]).



Note that an "author" can also be just an organization (by not specifying any of the name attributes, but adding the <organization> child element).

Furthermore, the "role" attribute can be used to mark an author as "editor". This is reflected both on the front page and in bibliographical references. Note that this specification does not define a precise meaning for the term "editor".

See Section "Authors vs. Contributors" of [[RFCPOLICY](#)] for more information.

This element appears as child element of: <front> ([Section 2.24](#)).

Content model:

In this order:

1. One optional <organization> element ([Section 2.34](#))
2. One optional <address> element ([Section 2.2](#))

#### [2.6.1.](#) 'ascii' attribute

The ASCII equivalent of the author's full name.

#### [2.6.2.](#) 'fullname' attribute

The full name (used in the automatically generated "Author's Address" section).

#### [2.6.3.](#) 'initials' attribute

Author initials (used on the front page and in references).

Initials should be provided as a whitespace separated list of pairs of a letter and a dot.

#### [2.6.4.](#) 'role' attribute

Specifies the role the author had in creating the document.

Allowed values:

- o "editor"





### [2.6.5.](#) 'surname' attribute

The author's surname.

### [2.6.6.](#) 'xml:lang' attribute

Allows specification of the language used. This is sometimes useful for renderers which display different fonts for CJK characters.

## [2.7.](#) <b>

Causes the text to be displayed in a bold font.

This element appears as child element of: <annotation> ([Section 2.3](#)), <blockquote> ([Section 2.9](#)), <c> ([Section 2.10](#)), <cref> ([Section 2.14](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <i> ([Section 2.25](#)), <innerRefContent> ([Section 2.26](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), <tindent> ([Section 2.50](#)), and <tt> ([Section 2.52](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <tt> elements ([Section 2.52](#))
- o <i> elements ([Section 2.25](#))

## [2.8.](#) <back>

Contains the "back" part of the document: the references and appendices.

This element appears as child element of: <rfc> ([Section 2.43](#)).

Content model:



In this order:

1. Optional <references> elements ([Section 2.41](#))
2. Optional <section> elements ([Section 2.44](#))

## **[2.9.](#) <blockquote>**

Specifies a block of text is a quotation. The "cite" attribute is required, and must be a URL.

Content model:

In any order:

- o Text
- o <figure> elements ([Section 2.22](#))
- o <artwork> elements ([Section 2.5](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

### **[2.9.1.](#) 'anchor' attribute**

Document-wide unique identifier for this quotation. The processor will auto-generate an identifier when none is given.

### **[2.9.2.](#) 'cite' attribute (mandatory)**

The source of the citation. This must be a URL. NEEDS AN EXAMPLE OF A CITE FOR A REFERENCE THAT IS ALREADY IN THE SPEC.

## **[2.10.](#) <c>**

Provides the content of a cell in a table.

This element appears as child element of: <texttable> ([Section 2.49](#)).

Content model:

In any order:



- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <ieref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <spanx> elements ([Section 2.46](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

#### [2.11.](#) <city>

Gives the city name in a postal address.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

#### [2.12.](#) <code>

Gives the postal region code.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

#### [2.13.](#) <country>

Gives the country in a postal address.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

#### [2.14.](#) <cref>

Represents a comment.

Comments can be used in a document while it is work-in-progress.  
They usually appear either inline and visually highlighted, at the



end of the document (depending on file format and settings of the formatter), or not at all (when generating an RFC).

This element appears as child element of: <annotation> ([Section 2.3](#)), <b> ([Section 2.7](#)), <c> ([Section 2.10](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <i> ([Section 2.25](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), <tindent> ([Section 2.50](#)), <tt> ([Section 2.52](#)), and <ttcol> ([Section 2.53](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))
- o <tt> elements ([Section 2.52](#))

#### [2.14.1.](#) 'anchor' attribute

Document-wide unique identifier for this comment. The processor will auto-generate an identifier when none is given.

#### [2.14.2.](#) 'source' attribute

Holds the "source" of a comment, such as the name or the initials of the person who made the comment.

#### [2.15.](#) <date>

Provides information about the publication date.

Note that this element is used both for the boilerplate of the document being produced, and also inside bibliographic references.

In the first case, it defines the publication date, which, when producing Internet-Drafts, will be used for computing the expiration date (see [[IDGUIDE](#)]). When "year", "month" or "day" are left out, the processor will attempt to use the current system date if the attributes that are specified do match the system date.





Note that month names need to match the full (English) month name ("January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", or "December") in order for expiration calculations to work (some implementations might support additional formats, though).

In the second case, the date information will be embedded as-is into the reference text. Therefore, also vague dates ("ca. 2000"), date ranges, and so on, are allowed.

This element appears as child element of: <front> ([Section 2.24](#)).

Content model: this element does not have any contents.

#### [2.15.1.](#) 'day' attribute

Day of publication.

#### [2.15.2.](#) 'month' attribute

Month of publication.

#### [2.15.3.](#) 'year' attribute

Year of publication.

### [2.16.](#) <dd>

The definition part of a entry in a definition list.

This element appears as child element of: <dl> ([Section 2.17](#)).

Content model:

In any order:

- o Text
- o <ol> elements ([Section 2.33](#))
- o <ul> elements ([Section 2.54](#))
- o <figure> elements ([Section 2.22](#))
- o <artwork> elements ([Section 2.5](#))
- o <xref> elements ([Section 2.58](#))



- o `<eref>` elements ([Section 2.20](#))
- o `<ieref>` elements ([Section 2.27](#))
- o `<cref>` elements ([Section 2.14](#))
- o `<tt>` elements ([Section 2.52](#))
- o `<b>` elements ([Section 2.7](#))
- o `<i>` elements ([Section 2.25](#))

### **[2.17.](#) `<dl>`**

A definition list. Each entry has a pair of elements: a term (`<dt>`) and a definition (`<dd>`).

This element appears as child element of: `<li>` ([Section 2.29](#)), and `<t>` ([Section 2.48](#)).

Content model:

One or more `<dt>` elements ([Section 2.18](#))

One or more `<dd>` elements ([Section 2.16](#))

#### **[2.17.1.](#) 'hanging' attribute**

The hanging attribute defines whether or not the term appears on the same line as the definition. `hanging="false"` indicates that the term is to the left of the definition, while `hanging="true"` indicates that the term will be on a separate line.

Allowed values:

- o `"false"` (default)
- o `"true"`

#### **[2.17.2.](#) 'spacing' attribute**

Defines whether or not there is a blank line between entries. `spacing="normal"` indicates a single blank line, while `spacing="compact"` indicates no space between.

Allowed values:



- o "normal" (default)
- o "compact"

### **2.18. <dt>**

The definition part of a entry in a definition list.

This element appears as child element of: <dl> ([Section 2.17](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

### **2.19. <email>**

Provides an email address.

The value is expected to be the scheme-specific part of a "mailto" URI (so does not include the prefix "mailto:"). See [Section 2 of \[RFC6068\]](#) for details.

This element appears as child element of: <address> ([Section 2.2](#)).

Content model: only text content.

#### **2.19.1. 'ascii' attribute**

The ASCII equivalent of the author's email address. This is only used if the email address has one or two internationalized components.



### **2.20. <eref>**

Represents an "external" link (as specified in the "target" attribute).

If the element has text content, that content will be used. Otherwise, the value of the target attribute will be inserted in angle brackets ([\[RFC3986\]](#), [Appendix C](#)).

This element appears as child element of: <annotation> ([Section 2.3](#)), <b> ([Section 2.7](#)), <c> ([Section 2.10](#)), <cref> ([Section 2.14](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <i> ([Section 2.25](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), <tindent> ([Section 2.50](#)), <tt> ([Section 2.52](#)), and <ttcol> ([Section 2.53](#)).

Content model: only text content.

#### **2.20.1. 'target' attribute (mandatory)**

URI of the link target (see [Section 3 of \[RFC3986\]](#)).

### **2.21. <facsimile>**

Deprecated.

This element appears as child element of: <address> ([Section 2.2](#)).

Content model: only text content.

### **2.22. <figure>**

A container for artwork that can have an optional title, preamble text, and postamble text.

This element appears as child element of: <blockquote> ([Section 2.9](#)), <dd> ([Section 2.16](#)), <li> ([Section 2.29](#)), <section> ([Section 2.44](#)), <t> ([Section 2.48](#)), and <tindent> ([Section 2.50](#)).

Content model:

In this order:

1. Optional <iref> elements ([Section 2.27](#))
2. One optional <preamble> element ([Section 2.39](#))





3. One or more <artwork> elements ([Section 2.5](#))
4. One optional <postamble> element ([Section 2.38](#))

#### [2.22.1.](#) 'align' attribute

Used to change the alignment of <preamble> and <postamble>.

Note: does not affect title or <artwork> alignment.

Allowed values:

- o "left" (default)
- o "center"
- o "right"

#### [2.22.2.](#) 'alt' attribute

Deprecated.

#### [2.22.3.](#) 'anchor' attribute

Document-wide unique identifier for this figure.

#### [2.22.4.](#) 'height' attribute

Deprecated.

#### [2.22.5.](#) 'src' attribute

Deprecated.

#### [2.22.6.](#) 'suppress-title' attribute

Figures that have an "anchor" attribute will automatically get an autogenerated title (such as "Figure 1"). Setting this attribute to "false" will prevent this.

Allowed values:

- o "true"
- o "false" (default)



#### [2.22.7.](#) **'title' attribute**

The title for the figure; this appears on a line after the artwork. If the figure has an "anchor" attribute, the title gets an autogenerated label such as "Figure 1", unless the "suppress-title" attribute is set to "true".

#### [2.22.8.](#) **'width' attribute**

Deprecated.

#### [2.23.](#) **<format>**

Deprecated. If the goal is to provide a single URI for a reference, use the "target" attribute on <reference> instead.

This element appears as child element of: <reference> ([Section 2.40](#)).

Content model: this element does not have any contents.

##### [2.23.1.](#) **'octets' attribute**

Deprecated.

##### [2.23.2.](#) **'target' attribute**

Deprecated.

##### [2.23.3.](#) **'type' attribute (mandatory)**

Deprecated.

#### [2.24.](#) **<front>**

Represent the "front matter": metadata (such as author information), abstract, and additional notes.

This element appears as child element of: <reference> ([Section 2.40](#)), and <rfc> ([Section 2.43](#)).

Content model:

In this order:

1. One <title> element ([Section 2.51](#))
2. One or more <author> elements ([Section 2.6](#))



3. One optional <date> element ([Section 2.15](#))
4. Optional <area> elements ([Section 2.4](#))
5. Optional <workgroup> elements ([Section 2.57](#))
6. Optional <keyword> elements ([Section 2.28](#))
7. One optional <abstract> element ([Section 2.1](#))
8. Optional <note> elements ([Section 2.32](#))

#### **[2.25.](#) <i>**

Causes the text to be displayed in an italic font.

This element appears as child element of: <annotation> ([Section 2.3](#)), <b> ([Section 2.7](#)), <blockquote> ([Section 2.9](#)), <c> ([Section 2.10](#)), <cref> ([Section 2.14](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <innerRefContent> ([Section 2.26](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), <tindent> ([Section 2.50](#)), and <tt> ([Section 2.52](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <b> elements ([Section 2.7](#))
- o <tt> elements ([Section 2.52](#))

#### **[2.26.](#) <innerRefContent>**

Text that should appear between the title and the date of a reference. The purpose of this element is to prevent the need to abuse <seriesInfo> to get such text in a reference.

This element appears as child element of: <reference> ([Section 2.40](#)).



Content model:

In any order:

- o Text
- o `<tt>` elements ([Section 2.52](#))
- o `<b>` elements ([Section 2.7](#))
- o `<i>` elements ([Section 2.25](#))

## **[2.27.](#) `<iref>`**

Provides terms for the document's index.

Index entries can be either single items (when just the "item" attribute is given) or nested items (by specifying "subitem" as well).

For instance:

```
<iref item="Grammar" subitem="item"/>
```

will produce an index entry for "Grammar, item".

This element appears as child element of: `<annotation>` ([Section 2.3](#)), `<b>` ([Section 2.7](#)), `<c>` ([Section 2.10](#)), `<dd>` ([Section 2.16](#)), `<dt>` ([Section 2.18](#)), `<figure>` ([Section 2.22](#)), `<i>` ([Section 2.25](#)), `<li>` ([Section 2.29](#)), `<postamble>` ([Section 2.38](#)), `<preamble>` ([Section 2.39](#)), `<section>` ([Section 2.44](#)), `<t>` ([Section 2.48](#)), `<tindent>` ([Section 2.50](#)), `<tt>` ([Section 2.52](#)), and `<ttcol>` ([Section 2.53](#)).

Content model: this element does not have any contents.

### **[2.27.1.](#) 'item' attribute (mandatory)**

The item to include.

### **[2.27.2.](#) 'primary' attribute**

Setting this to "true" declares the occurrence as "primary", which might cause it to be highlighted in the index.

Allowed values:





- o "true"
- o "false" (default)

### **[2.27.3.](#) 'subitem' attribute**

The subitem to include.

### **[2.28.](#) <keyword>**

Specifies a keyword applicable to the document.

Note that each element should only contain a single keyword; for multiple keywords, the element can simply be repeated.

Keywords are used both in the RFC Index and in the metadata of generated document formats.

This element appears as child element of: <front> ([Section 2.24](#)).

Content model: only text content.

### **[2.29.](#) <li>**

A list element, used in <ol> and <ul>.

This element appears as child element of: <ol> ([Section 2.33](#)), and <ul> ([Section 2.54](#)).

Content model:

Either:

- o One or more <t> elements ([Section 2.48](#))

Or:

- o Text

One or more <ol> elements ([Section 2.33](#))

One or more <ul> elements ([Section 2.54](#))

One or more <dl> elements ([Section 2.17](#))

One or more <figure> elements ([Section 2.22](#))

One or more <artwork> elements ([Section 2.5](#))



One or more <xref> elements ([Section 2.58](#))

One or more <eref> elements ([Section 2.20](#))

One or more <iref> elements ([Section 2.27](#))

One or more <cref> elements ([Section 2.14](#))

One or more <tt> elements ([Section 2.52](#))

One or more <b> elements ([Section 2.7](#))

One or more <i> elements ([Section 2.25](#))

### [2.30.](#) <list>

Deprecated. Instead, use <dl> for list/@style "hanging"; <ul> for list/@style "empty" or "symbols"; and <ol> for list/@style "letters", "numbers", or "format"

This element appears as child element of: <t> ([Section 2.48](#)).

Content model:

One or more <t> elements ([Section 2.48](#))

#### [2.30.1.](#) 'counter' attribute

Deprecated.

#### [2.30.2.](#) 'hangIndent' attribute

Deprecated.

#### [2.30.3.](#) 'style' attribute

Deprecated.

### [2.31.](#) <middle>

Represents the main content of the document.

This element appears as child element of: <rfc> ([Section 2.43](#)).

Content model:

One or more <section> elements ([Section 2.44](#))



### [2.32.](#) **<note>**

Creates an unnumbered section that appears after the abstract.

It is usually used for additional information to reviewers (working group information, mailing list, ...), or for additional publication information such as "IESG Notes".

This element appears as child element of: <front> ([Section 2.24](#)).

Content model:

One or more <t> elements ([Section 2.48](#))

#### [2.32.1.](#) **'title' attribute (mandatory)**

The title of the note.

### [2.33.](#) **<ol>**

An ordered list. The labels on the items will be either a number or a letter, depending on the value of the style attribute.

This element appears as child element of: <dd> ([Section 2.16](#)), <li> ([Section 2.29](#)), and <t> ([Section 2.48](#)).

Content model:

One or more <li> elements ([Section 2.29](#))

#### [2.33.1.](#) **'spacing' attribute**

Defines whether or not there is a blank line between entries. spacing="normal" indicates a single blank line, while spacing="compact" indicates no space between.

Allowed values:

- o "normal" (default)
- o "compact"

#### [2.33.2.](#) **'start' attribute**

The ordinal value to start the list at. This defaults to "1".



### [2.33.3.](#) 'style' attribute

The style of the labels on list items. If the length of the style value is 1, the meaning is the same as it is for HTML:

- a Lowercase letters (a, b, c, ...)
- A Uppercase letters (A, B, C, ...)
- 1 Decimal numbers (1, 2, 3, ...)
- i Lowercase Roman numerals (i, ii, iii, ...)
- I Uppercase Roman numerals (I, II, III, ...)

If the length of the style value is greater than 1, the value must contain a percent-encoded indicator and other text. The value is a free-form text that allows counter values to be inserted using a "percent-letter" format. For instance, "[REQ%d]" generates labels of the form "[REQ1]", where "%d" inserts the item number as decimal number.

The following formats are supported:

- %c Lowercase letters (a, b, c, ...)
- %C Uppercase letters (A, B, C, ...)
- %d Decimal numbers (1, 2, 3, ...)
- %i Lowercase Roman numerals (i, ii, iii, ...)
- %I Uppercase Roman numerals (I, II, III, ...)
- %% Represents a percent sign

Other formats are reserved for future use.

### [2.34.](#) <organization>

Specifies the affiliation of an author.

This information appears in both the "Author's Address" section and on the front page (see [\[RFCSTYLE\]](#) for more information). If the value is long, an abbreviated variant can be specified in the "abbrev" attribute.

This element appears as child element of: <author> ([Section 2.6](#)).





Content model: only text content.

#### [2.34.1.](#) **'abbrev' attribute**

Abbreviated variant.

#### [2.34.2.](#) **'ascii' attribute**

The ASCII equivalent of the organization's name.

#### [2.35.](#) **<phone>**

Represents a phone number.

The value is expected to be the scheme-specific part of a "tel" URI (so does not include the prefix "tel:"), using the "global numbers" syntax. See [Section 3 of \[RFC3966\]](#) for details.

This element appears as child element of: <address> ([Section 2.2](#)).

Content model: only text content.

#### [2.36.](#) **<postal>**

Contains optional child elements providing postal information. These elements will be displayed in an order that is processor-specific. A postal address can contain only a set of <street>, <city>, <region>, <code>, and <country> elements, or only an ordered set of <postalline> elements, but not both.

This element appears as child element of: <address> ([Section 2.2](#)).

Content model:

Either:

o In any order:

- \* <street> elements ([Section 2.47](#))
- \* <city> elements ([Section 2.11](#))
- \* <region> elements ([Section 2.42](#))
- \* <code> elements ([Section 2.12](#))
- \* <country> elements ([Section 2.13](#))



Or:

- o One or more <postalline> elements ([Section 2.37](#))

### **[2.37.](#) <postalline>**

Represents one line of a postal address. When more than one <postalline> is given, the processor emits them in the order given.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

### **[2.38.](#) <postamble>**

Gives text that appears at the bottom of a figure or table.

This element appears as child element of: <figure> ([Section 2.22](#)), and <texttable> ([Section 2.49](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <spanx> elements ([Section 2.46](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

### **[2.39.](#) <preamble>**

Gives text that appears at the top of a figure or table.

This element appears as child element of: <figure> ([Section 2.22](#)), and <texttable> ([Section 2.49](#)).



Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <ieref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <spanx> elements ([Section 2.46](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

#### **[2.40.](#) <reference>**

Represents a bibliographical reference.

The reference can be expressed in one of two ways:

As a <front> element plus optional <seriesInfo>, <format>, and <annotation> elements.

As a pair of attributes: "series" and "document".

In the latter method, the document does not need to contain any specifics for the reference other than a simple specification of the reference.

For example, a reference to [RFC 6068](#) is given as either:

```
<reference anchor="RFC6068">
  <front>
    <title>The 'mailto' URI Scheme</title>
    <author initials="M." surname="Duerst" fullname="M. Duerst"/>
    <author initials="L." surname="Masinter" fullname="L. Masinter"/>
    <author initials="J." surname="Zawinski" fullname="J. Zawinski"/>
    <date year="2010" month="October"/>
  </front>
  <seriesInfo name="RFC" value="6068"/>
```



</reference>

or

<reference anchor="[RFC6068](#)" series="rfc" document="6068">

The values for the "series" attribute are:

| Value<br>for<br>"series" | Value for "document"  | Example                                   |
|--------------------------|---|---|
| rfc                      | number  | "6068"                                    |
| fyi                      | number  | "7"                                       |
| id                       | file name   | " <a href="#">draft-hoffman-xml2rfc</a> " |
| bcp                      | comma-separated list<br>of numbers; the first<br>number is the BCP<br>number and the others<br>are the RFCs that make<br>up the BCP | "79,3979,4879"                            |
| std                      | comma-separated list<br>of numbers; the first<br>number is the STD<br>number and the others<br>are the RFCs that make<br>up the STD | "69,5730,5731,5732,5733,5734"             |
| 3gpp                     | TBD   | "TBD"                                     |
| ansi                     | document name and year  | "T1-102.1987"                             |
| ccitt                    | document name and year  | "X690.2002"                               |
| fips                     | document name and year  | "500-166.1989"                            |
| ieee                     | document name and year  | "802-11H.2003"                            |
| iso                      | document name and year  | "8859-6.1988"                             |
| itu                      | document name and year  | "X509.2000"                               |
| nist                     | document name and year  | "500-214.1993"                            |
| pkcs                     | document name and year  | "9.1993"                                  |
| w3c                      | document name (and<br>year?)  | "TBD"                                     |
| xf                       | document name (and<br>year?)  | "XEP-0334"                                |

The processor needs to make sure that exactly zero or one of "series" is given. It has to do a sanity check on the "document" value to be sure that the value is valid for the "series". If the "series" value is "bcp" or "std", the processor needs to check if the list in the "document" list matches the present or a previous set of values for





the BCP or STD.

This element appears as child element of: <references> ([Section 2.41](#)).

Content model: this element does not have any contents.

#### [2.40.1.](#) 'anchor' attribute (mandatory)

Document-wide unique identifier for this reference. Usually, this will be used both to "label" the reference in the references section, and as an identifier in links to this reference entry.

#### [2.40.2.](#) 'document' attribute (mandatory)

The document or documents that make up a reference, as described earlier in this section.

#### [2.40.3.](#) 'series' attribute (mandatory)

The series from which the referred-to document comes from, as described earlier in this section.

#### [2.40.4.](#) 'target' attribute

Holds the URI for the reference.

Note that depending on the <seriesInfo> element, a URI might not be needed, nor desirable, as it can be automatically generated (for instance, for RFCs).

### [2.41.](#) <references>

Contains a set of bibliographical references.

In the early days of the RFC series, there was only one "References" section per RFC. This convention was later changed to group references into two sets, "Normative" and "Informative" as described in [[RFCSTYLE](#)]). This vocabulary supports the split with the "title" attribute.

This element appears as child element of: <back> ([Section 2.8](#)).

Content model:

One or more <reference> elements ([Section 2.40](#))



#### [2.41.1.](#) 'title' attribute

Provides the title for the References section (defaulting to "References").

In general, the title should be either "Normative References" or "Informative References".

#### [2.42.](#) <region>

Provides the region name in a postal address.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

#### [2.43.](#) <rfc>

This is the root element of the xml2rfc vocabulary.

Processors distinguish between RFC mode ("number" attribute being present) and Internet-Draft mode ("docName" attribute being present): it is invalid to specify both. Setting neither "number" nor "docName" can be useful for producing other types of document but is out-of-scope for this specification.

Content model:

In this order:

1. One <front> element ([Section 2.24](#))
2. One <middle> element ([Section 2.31](#))
3. One optional <back> element ([Section 2.8](#))

#### [2.43.1.](#) 'category' attribute

Document category (see [Appendix A.1](#)).

Allowed values:

- o "std"
- o "bcp"
- o "info"



- o "exp"
- o "historic"

#### **2.43.2. 'consensus' attribute**

Affects the generated boilerplate.

See [[RFC5741](#)] for more information.

Allowed values:

- o "no"
- o "yes"

#### **2.43.3. 'docName' attribute**

For Internet-Drafts, this specifies the draft name (which appears below the title).

Note that the file extension is not part of the draft, so in general it should end with the current draft number ("- ", plus two digits).

Furthermore, it is good practice to disambiguate current editor copies from submitted drafts (for instance, by replacing the draft number with the string "latest").

See [[IDGUIDE](#)] for further information.

#### **2.43.4. 'ipr' attribute**

Represents the Intellectual Property status of the document. See [Appendix A.2](#) for details.

Allowed values:

- o "full2026"
- o "noDerivativeWorks2026"
- o "none"
- o "full3667"
- o "noModification3667"



- o "noDerivatives3667"
- o "full3978"
- o "noModification3978"
- o "noDerivatives3978"
- o "trust200811"
- o "noModificationTrust200811"
- o "noDerivativesTrust200811"
- o "trust200902"
- o "noModificationTrust200902"
- o "noDerivativesTrust200902"
- o "pre5378Trust200902"

#### **2.43.5. 'iprExtract' attribute**

Identifies a Section within the document for which extraction "as-is" is explicitly allowed (only relevant for historic values of the "ipr" attribute).

#### **2.43.6. 'number' attribute**

The number of the RFC to be produced.

#### **2.43.7. 'obsoletes' attribute**

A comma-separated list of RFC numbers or Internet-Draft names.

#### **2.43.8. 'seriesNo' attribute**

When producing a document within document series (such as "STD"): the number within that series.

#### **2.43.9. 'submissionType' attribute**

The document stream.

See [Section 2 of \[RFC5741\]](#) for details.

Allowed values:





- o "IETF" (default)
- o "IAB"
- o "IRTF"
- o "independent"

#### [2.43.10](#). 'updates' attribute

A comma-separated list of RFC numbers or Internet-Draft names.

#### [2.43.11](#). 'xml:lang' attribute

The natural language used in the document (defaults to "en").

See Section 2.12 of [[XML](#)] for more information.

### [2.44](#). <section>

Represents a section (when inside a <middle> element) or an appendix (when inside a <back> element).

Sub-sections are created by nesting <section> elements inside <section> elements.

This element appears as child element of: <back> ([Section 2.8](#)), <middle> ([Section 2.31](#)), and <section> ([Section 2.44](#)).

Content model:

In this order:

1. In any order:

- \* <t> elements ([Section 2.48](#))
- \* <tindent> elements ([Section 2.50](#))
- \* <figure> elements ([Section 2.22](#))
- \* <texttable> elements ([Section 2.49](#))
- \* <iref> elements ([Section 2.27](#))
- \* <artwork> elements ([Section 2.5](#))



## 2. Optional <section> elements ([Section 2.44](#))

### [2.44.1.](#) 'anchor' attribute

Document-wide unique identifier for this section.

### [2.44.2.](#) 'numbered' attribute

If set to "no", this section does not get a section number. Processors will verify that such a section is not followed by a numbered section in a part, and will verify that the section is a top-level section.

Allowed values:

- o "yes" (default)
- o "no"

### [2.44.3.](#) 'removeinrfc' attribute

If set to "yes", this section is marked in the processor with text indicating that it should be removed before the document is published as an RFC.

Allowed values:

- o "yes"
- o "no" (default)

### [2.44.4.](#) 'title' attribute (mandatory)

The title of the section.

### [2.44.5.](#) 'toc' attribute

Determines whether the section is included in the Table Of Contents.

[[anchor2: Need to consider inheritance.]]

Allowed values:

- o "include"
- o "exclude"



- o "default" (default)

#### **[2.45.](#) <seriesInfo>**

Specifies the document series in which this document appears, and also specifies an identifier within that series.

This element appears as child element of: <reference> ([Section 2.40](#)).

Content model: this element does not have any contents.

##### **[2.45.1.](#) 'name' attribute (mandatory)**

The name of the series.

The following names trigger specific processing (such as for auto-generating links, and adding descriptions such as "work in progress"): "BCP", "FYI", "Internet-Draft", "RFC", and "STD".

##### **[2.45.2.](#) 'value' attribute (mandatory)**

The identifier within the series specified by the "name" attribute.

For BCPs, FYIs, RFCs, and STDs this is the number within the series. For Internet-Drafts, it is the full draft name (ending with the two-digit version number).

#### **[2.46.](#) <spanx>**

Deprecated. Use <b>, <i>, and <tt> instead.

This element appears as child element of: <annotation> ([Section 2.3](#)), <c> ([Section 2.10](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), and <t> ([Section 2.48](#)).

Content model: only text content.

##### **[2.46.1.](#) 'style' attribute**

Deprecated.

##### **[2.46.2.](#) 'xml:space' attribute**

Deprecated.

Allowed values:



- o "default"
- o "preserve" (default)

#### **[2.47.](#) <street>**

Provides a street address.

This element appears as child element of: <postal> ([Section 2.36](#)).

Content model: only text content.

#### **[2.48.](#) <t>**

Contains a paragraph of text.

This element appears as child element of: <abstract> ([Section 2.1](#)), <li> ([Section 2.29](#)), <list> ([Section 2.30](#)), <note> ([Section 2.32](#)), and <section> ([Section 2.44](#)).

Content model:

In any order:

- o Text
- o <list> elements ([Section 2.30](#))
- o <ol> elements ([Section 2.33](#))
- o <ul> elements ([Section 2.54](#))
- o <dl> elements ([Section 2.17](#))
- o <figure> elements ([Section 2.22](#))
- o <artwork> elements ([Section 2.5](#))
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <spanx> elements ([Section 2.46](#))





- o `<vspace>` elements ([Section 2.56](#))
- o `<tt>` elements ([Section 2.52](#))
- o `<b>` elements ([Section 2.7](#))
- o `<i>` elements ([Section 2.25](#))

#### **[2.48.1.](#) 'anchor' attribute**

Document-wide unique identifier for this paragraph.

#### **[2.49.](#) `<texttable>`**

Contains a table, consisting of an optional preamble, a header line, rows, and an optional postamble.

The number of columns in the table is determined by the number of `<ttcol>` elements. The number of rows in the table is determined by the number of `<c>` elements divided by the number of columns. There is no requirement that the number of `<c>` elements be evenly divisible by the number of columns.

This element appears as child element of: `<section>` ([Section 2.44](#)).

Content model:

In this order:

1. One optional `<preamble>` element ([Section 2.39](#))
2. One or more `<ttcol>` elements ([Section 2.53](#))
3. Optional `<c>` elements ([Section 2.10](#))
4. One optional `<postamble>` element ([Section 2.38](#))

#### **[2.49.1.](#) 'align' attribute**

Determines the horizontal alignment of the table.

Allowed values:

- o "left"
- o "center" (default)



- o "right"

#### **2.49.2. 'anchor' attribute**

Document-wide unique identifier for this table.

#### **2.49.3. 'style' attribute**

Selects which borders should be drawn, where

- o "all" means borders around all table cells,
- o "full" is like "all" except no horizontal lines between table rows (except below the column titles),
- o "headers" adds just a separator between column titles and rows, and
- o "none" means no borders at all.

Allowed values:

- o "all"
- o "none"
- o "headers"
- o "full" (default)

#### **2.49.4. 'suppress-title' attribute**

Tables that have an "anchor" attribute will automatically get an autogenerated title (such as "Table 1"). Setting this attribute to "false" will prevent this.

Allowed values:

- o "true"
- o "false" (default)

#### **2.49.5. 'title' attribute**

The title for the table; this appears on a line after the table's body. If the table has an "anchor" attribute, the title gets an autogenerated label such as "Table 1", unless the "suppress-title" attribute is set to "true".



### **[2.50.](#) <tindent>**

Contains a paragraph of text. The paragraph is displayed with the left and right paragraph margins indented from the page margins.

This element appears as child element of: <section> ([Section 2.44](#)).

Content model:

In any order:

- o Text
- o <figure> elements ([Section 2.22](#))
- o <artwork> elements ([Section 2.5](#))
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <tt> elements ([Section 2.52](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

#### **[2.50.1.](#) 'anchor' attribute**

Document-wide unique identifier for this indented paragraph.

### **[2.51.](#) <title>**

Represents the document title.

When this element appears in the <front> element of the current document, the title might also appear in page headers or footers. If it's long (~40 characters), the "abbrev" attribute is used to specify an abbreviated variant.

This element appears as child element of: <front> ([Section 2.24](#)).

Content model: only text content.



### **2.51.1. 'abbrev' attribute**

Specifies an abbreviated variant of the document title.

### **2.52. <tt>**

Causes the text to be displayed in a constant-width font.

This element appears as child element of: <annotation> ([Section 2.3](#)), <b> ([Section 2.7](#)), <blockquote> ([Section 2.9](#)), <c> ([Section 2.10](#)), <cref> ([Section 2.14](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <i> ([Section 2.25](#)), <innerRefContent> ([Section 2.26](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), and <tindent> ([Section 2.50](#)).

Content model:

In any order:

- o Text
- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))
- o <iref> elements ([Section 2.27](#))
- o <cref> elements ([Section 2.14](#))
- o <b> elements ([Section 2.7](#))
- o <i> elements ([Section 2.25](#))

### **2.53. <tthcol>**

Contains a column heading in a table.

This element appears as child element of: <texttable> ([Section 2.49](#)).

Content model:

In any order:

- o <xref> elements ([Section 2.58](#))
- o <eref> elements ([Section 2.20](#))





- o `<iref>` elements ([Section 2.27](#))
- o `<cref>` elements ([Section 2.14](#))
- o Text

#### **[2.53.1.](#) 'align' attribute**

Determines the horizontal alignment within the table column.

Allowed values:

- o "left" (default)
- o "center"
- o "right"

#### **[2.53.2.](#) 'width' attribute**

The desired column width (as integer 0..100 followed by "%").

#### **[2.54.](#) `<ul>`**

An unordered list. The labels on the items will be symbols picked by the processor.

This element appears as child element of: `<dd>` ([Section 2.16](#)), `<li>` ([Section 2.29](#)), and `<t>` ([Section 2.48](#)).

Content model:

One or more `<li>` elements ([Section 2.29](#))

##### **[2.54.1.](#) 'empty' attribute**

Defines whether or not the label is empty. `empty="true"` indicates that no label be shown.

Allowed values:

- o "false" (default)
- o "true"



#### [2.54.2.](#) 'spacing' attribute

Defines whether or not there is a blank line between entries.  
spacing="normal" indicates a single blank line, while  
spacing="compact" indicates no space between.

Allowed values:

- o "normal" (default)
- o "compact"

#### [2.55.](#) <uri>

Contains a web address associated with the author.

The contents should be a valid URI (see [Section 3 of \[RFC3986\]](#)).

This element appears as child element of: <address> ([Section 2.2](#)).

Content model: only text content.

#### [2.56.](#) <vspace>

Deprecated.

This element appears as child element of: <t> ([Section 2.48](#)).

Content model: this element does not have any contents.

#### [2.56.1.](#) 'blankLines' attribute

Deprecated.

#### [2.57.](#) <workgroup>

This element is used to specify the Working Group the document originates from, if any. The recommended format is the official name of the Working Group (with some capitalization).

In Internet-Drafts, this is used in the upper left corner of the boilerplate, replacing the "Network Working Group" string. Formatting software can append the words "Working Group" or "Research Group", depending on the "submissionType" property on the <rfc> element ([Section 2.43.9](#)).

This element appears as child element of: <front> ([Section 2.24](#)).



Content model: only text content.

## 2.58. <xref>

Inserts a reference to a different part of a document.

The generated text depends on whether the <xref> is empty (in which case the processor will try to generate a meaningful text fragment), and the nature of the referenced document part.

Any element that allows the "anchor" attribute can be referenced, however there are restrictions with respect to the text content being generated. For instance, a <t> can be a reference target, however, because paragraphs are not (visibly) numbered, the author will have to make sure that the prose is sufficient for a reader to understand what is being referred to.

This element appears as child element of: <annotation> ([Section 2.3](#)), <b> ([Section 2.7](#)), <c> ([Section 2.10](#)), <cref> ([Section 2.14](#)), <dd> ([Section 2.16](#)), <dt> ([Section 2.18](#)), <i> ([Section 2.25](#)), <li> ([Section 2.29](#)), <postamble> ([Section 2.38](#)), <preamble> ([Section 2.39](#)), <t> ([Section 2.48](#)), <tindent> ([Section 2.50](#)), <tt> ([Section 2.52](#)), and <ttcol> ([Section 2.53](#)).

Content model: only text content.

### 2.58.1. 'format' attribute

This attribute is used to control the format of the generated reference text.

"counter"

Inserts a counter, such as the number of a section, figure, or table.

"default"

Inserts a text fragment that describes the referenced part completely, such as "[Section 2](#)", "Table 4", or "[[XML](#)]".

"none"

There will be no auto-generated text.

"title"



Inserts a title for the referenced element (usually obtained from the referenced element's "title" attribute; some processors also use the <title> child element or a <reference> target).

Allowed values:

- o "counter"
- o "title"
- o "none"
- o "default" (default)

#### **2.58.2. 'pageno' attribute**

Deprecated.

Allowed values:

- o "true"
- o "false" (default)

#### **2.58.3. 'section' attribute**

Specifies a section for the generated reference. For example,

See <xref section="2.3" target="[RFC6949](#)"/> for more information.

would generate

See [Section 2.3 of \[RFC6949\]](#) for more information.

#### **2.58.4. 'target' attribute (mandatory)**

Identifies the document component being referenced.

The value needs to match the value of the "anchor" attribute of another element in the document.

### **3. Special Unicode Code Points**

[[anchor3: Explain those code points where the processors implement something special, such as "nbsp".]]





#### **4. Internationalization Considerations**

This format is based on [XML], thus does not have any issues representing arbitrary Unicode [UNICODE] characters in text content.

However, the current canonical RFC format is restricted to US-ASCII [USASCII] characters ([RFC2223], Section 3). Future versions are likely to relax this role, and it is expected that the vocabulary will be extended so that US-ASCII alternatives can be provided when that makes sense (for instance, in contact information).

#### **5. Security Considerations**

The "name" attribute on the <artwork> element (Section 2.5.4) can be used to derive a filename for saving to a local file system. Trusting this kind of information without pre-processing is a known security risk; see Section 4.3 of [RFC6266] for more information.

Furthermore, all security considerations related to XML processing are relevant as well (see Section 7 of [RFC3470]).

#### **6. IANA Considerations**

##### **6.1. Internet Media Type Registration**

IANA maintains the registry of Internet media types [BCP13] at <<http://www.iana.org/assignments/media-types>>.

This document serves as the specification for the Internet media type "application/rfc+xml". The following is to be registered with IANA.

Type name: application

Subtype name: rfc+xml

Required parameters: There are no required parameters.

Optional parameters: "charset": This parameter has identical semantics as the charset parameter of the "application/xml" media type specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in Section 3.2 of [RFC3023].

Security considerations: As defined in Section 5. In addition, as this media type uses the "+xml" convention, it inherits the security considerations described in Section 10 of [RFC3023].



Interoperability considerations: N/A

Published specification: This specification.

Applications that use this media type: Applications that either transform xml2rfc to output formats such as plain text or HTML, plus additional analysis tools.

Fragment identifier considerations: The "anchor" attribute is used for assigning document-wide unique identifiers that can be used as shorthand pointers, as described in Section 2.8 of [[XPOINTER](#)].

Additional information:

Deprecated alias names for this type: None.

Magic number(s): As specified for "application/xml" in [Section 3.2 of \[RFC3023\]](#).

File extension(s): .xml

Macintosh file type code(s): TEXT

Person & email address to contact for further information: See Authors Section.

Intended usage: COMMON

Restrictions on usage: N/A

Author: See Authors Section.

Change controller: RFC Series Editor ([rse@rfc-editor.org](mailto:rse@rfc-editor.org))

## [7.](#) Acknowledgments

Thanks to everybody who reviewed this document and provided feedback and/or specification text. Thanks especially go to Julian Reschke for editing [[XML2RFCv2](#)] and those who provided feedback on that document.

We also thank Marshall T. Rose for both the original design and the reference implementation of the "xml2rfc" formatter.

## [8.](#) References



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Latest version available at  
[<http://www.w3.org/TR/xptr-framework/>](http://www.w3.org/TR/xptr-framework/).

## **Appendix A. Front Page Generation**

### **A.1. The /rfc/@category Attribute**

For RFCs, the category determines the "maturity level" (see [Section 4 of \[RFC2026\]](#)). The allowed values are "std" for "Standards Track", "bcp" for "BCP", "info" for "Informational", "exp" for "Experimental", and "historic" for - surprise - "Historic".

For Internet-Drafts, the category attribute is not needed, but will appear on the front page as "Intended Status". Supplying this information can be useful to reviewers.

### **A.2. The /rfc/@ipr Attribute**

This attribute value can take a long list of values, each of which describes an IPR policy for the document. This attribute's values are not the result of a grand plan, but remain simply for historic reasons. Of these values, only a few are currently in use; all others are supported by the various tools for backwards compatibility with old source files.

Note: some variations of the boilerplate are selected based on the document's date; therefore it is important to specify the "year", "month" and "day" attributes of the <date> element when archiving the XML source of an Internet-Draft on the day of submission.

Disclaimer: THIS ONLY PROVIDES IMPLEMENTATION INFORMATION. IF YOU NEED LEGAL ADVICE, PLEASE CONTACT A LAWYER. For further information, refer to [<http://trustee.ietf.org/docs/IETF-Copyright-FAQ.pdf>](http://trustee.ietf.org/docs/IETF-Copyright-FAQ.pdf).

For the current "Status Of This Memo" text, the submissionType attribute determines whether a statement about "Code Components" is inserted (which is the case for the value "IETF", which is the default). Other values, such as "independent", suppress this part of the text.

#### **A.2.1. Current Values: '\*trust200902'**

The name for these values refers to the "IETF TRUST Legal Provisions Relating to IETF Documents", sometimes simply called the "TLP, that went into effect on February 15, 2009 ([[TLP2.0](#)]). Updates to this



document were published on September 12, 2009 ([[TLP3.0](#)]) and on December 28, 2009 ([[TLP4.0](#)]), modifying the license for code components (see <<http://trustee.ietf.org/license-info/>> for further information). The actual text is located in [Section 6](#) ("Text To Be Included in IETF Documents") of these documents.

The tools will automatically produce the "correct" text depending on the document's date information (see above):

```
+-----+-----+
| TLP      | starting with publication date |
+-----+-----+
| [TLP3.0] | 2009-11-01                      |
| [TLP4.0] | 2010-04-01                      |
+-----+-----+
```

#### [A.2.1.1.](#) **trust200902**

This should be the default, unless one of the more specific '\*trust200902' values is a better fit. It produces the text in Sections [6.a](#) and [6.b](#) of the TLP.

#### [A.2.1.2.](#) **noModificationTrust200902**

This produces additional text from [Section 6.c.i](#) of the TLP:

This document may not be modified, and derivative works of it may not be created, except to format it for publication as an RFC or to translate it into languages other than English.

Note: this clause is incompatible with RFCs that are published on the Standards Track.

#### [A.2.1.3.](#) **noDerivativesTrust200902**

This produces the additional text from [Section 6.c.ii](#) of the TLP:

This document may not be modified, and derivative works of it may not be created, and it may not be published except as an Internet-Draft.

Note: this clause is incompatible with RFCs.

#### [A.2.1.4.](#) **pre5378Trust200902**

This produces the additional text from [Section 6.c.iii](#) of the TLP, frequently called the "pre-5378 escape clause":



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See [Section 4](#) of <http://trustee.ietf.org/docs/IETF-Copyright-FAQ.pdf> for further information about when to use this value.

Note: this text appears under "Copyright Notice", unless the document was published before November 2009, in which case it appears under "Status Of This Memo".

#### [A.2.2.](#) **Historic Values**

##### [A.2.2.1.](#) **Historic Values: '\*trust200811'**

The attribute values "trust200811", "noModificationTrust200811" and "noDerivativesTrust200811" are similar to their "trust200902" counterparts, except that they use text specified in [http://trustee.ietf.org/license-info/archive/IETF-Trust-License-Policy\\_11-10-08.pdf](http://trustee.ietf.org/license-info/archive/IETF-Trust-License-Policy_11-10-08.pdf).

##### [A.2.2.2.](#) **Historic Values: '\*3978'**

The attribute values "full3978", "noModification3978" and "noDerivatives3978" are similar to their counterparts above, except that they use text specified in [RFC 3978](#) (March 2005).

##### [A.2.2.3.](#) **Historic Values: '\*3667'**

The attribute values "full3667", "noModification3667" and "noDerivatives3667" are similar to their counterparts above, except that they use text specified in [RFC 3667](#) (February 2004).

##### [A.2.2.4.](#) **Historic Values: '\*2026'**

The attribute values "full2026" and "noDerivativeWorks2026" are similar to their counterparts above, except that they use text specified in [RFC 2026](#) (October 1996).



The special value "none" was also used back then, and denied the IETF any rights beyond publication as Internet-Draft.

## [Appendix B](#). Relax NG Schema

```
namespace a = "http://relaxng.org/ns/compatibility/annotations/1.0"

rfc =
  element rfc {
    attribute number { text }?,
    [ a:defaultValue = "" ] attribute obsoletes { text }?,
    [ a:defaultValue = "" ] attribute updates { text }?,
    attribute category { "std" | "bcp" | "info" | "exp" | "historic"
  }?,
  attribute consensus { "no" | "yes" }?,
  attribute seriesNo { text }?,
  attribute ipr {
    "full2026"
    | "noDerivativeWorks2026"
    | "none"
    | "full3667"
    | "noModification3667"
    | "noDerivatives3667"
    | "full3978"
    | "noModification3978"
    | "noDerivatives3978"
    | "trust200811"
    | "noModificationTrust200811"
    | "noDerivativesTrust200811"
    | "trust200902"
    | "noModificationTrust200902"
    | "noDerivativesTrust200902"
    | "pre5378Trust200902"
  }?,
  attribute iprExtract { xsd:IDREF }?,
  [ a:defaultValue = "IETF" ]
  attribute submissionType {
    "IETF" | "IAB" | "IRTF" | "independent"
  }?,
  attribute docName { text }?,
  [ a:defaultValue = "en" ] attribute xml:lang { text }?,
  front,
  middle,
  back?
  }
front =
  element front {
```





```
    title, author+, date?, area*, workgroup*, keyword*, abstract?,
note*
}
title =
  element title {
    attribute abbrev { text }?,
    text
  }
author =
  element author {
    attribute initials { text }?,
    attribute surname { text }?,
    attribute fullname { text }?,
    attribute role { "editor" }?,
    [ a:defaultValue = "en" ] attribute xml:lang { text }?,
    attribute ascii { text }?,
    organization?,
    address?
  }
organization =
  element organization {
    attribute abbrev { text }?,
    attribute ascii { text }?,
    text
  }
address =
  element address { (postal | phone | facsimile | email | uri)* }
postal =
  element postal {
    (street | city | region | code | country)* | postalline+
  }
street = element street { text }
city = element city { text }
region = element region { text }
code = element code { text }
country = element country { text }
postalline = element postalline { text }
phone = element phone { text }
facsimile = element facsimile { text }
email =
  element email {
    attribute ascii { text }?,
    text
  }
uri = element uri { text }
date =
  element date {
    attribute day { text }?,
```



```
    attribute month { text }?,
    attribute year { text }?,
    empty
  }
area = element area { text }
workgroup = element workgroup { text }
keyword = element keyword { text }
abstract = element abstract { t+ }
note =
  element note {
    attribute title { text },
    t+
  }
middle = element middle { section+ }
section =
  element section {
    attribute anchor { xsd:ID }?,
    attribute title { text },
    [ a:defaultValue = "yes" ] attribute numbered { "yes" | "no" }?,
    [ a:defaultValue = "default" ]
    attribute toc { "include" | "exclude" | "default" }?,
    [ a:defaultValue = "no" ] attribute removeinrfc { "yes" | "no"
  }?,
  (t | tindent | figure | texttable | iref | artwork)*,
  section*
}
t =
  element t {
    attribute anchor { xsd:ID }?,
    (text
    | \list
    | ol
    | ul
    | dl
    | figure
    | artwork
    | xref
    | eref
    | iref
    | cref
    | spanx
    | vspace
    | tt
    | b
    | i)*
  }
tindent =
  element tindent {
```



```

        attribute anchor { xsd:ID }?,
        (text | figure | artwork | xref | eref | iref | cref | tt | b |
i)*
    }
blockquote =
    element blockquote {
        attribute anchor { xsd:ID }?,
        attribute cite { text },
        (text | figure | artwork | tt | b | i)*
    }
\list =
    element list {
        [ a:defaultValue = "empty" ] attribute style { text }?,
        attribute hangIndent { text }?,
        attribute counter { text }?,
        t+
    }
ol =
    element ol {
        [ a:defaultValue = "1" ] attribute style { text }?,
        [ a:defaultValue = "1" ] attribute start { text }?,
        [ a:defaultValue = "normal" ]
        attribute spacing { "normal" | "compact" }?,
        li+
    }
ul =
    element ul {
        [ a:defaultValue = "normal" ]
        attribute spacing { "normal" | "compact" }?,
        [ a:defaultValue = "false" ] attribute empty { "false" | "true"
}?,
        li+
    }
li =
    element li {
        t+
        | (text,
            ol,
            ul,
            dl,
            figure,
            artwork,
            xref,
            eref,
            iref,
            cref,
            tt,
            b,

```



```
        i)+
    }
dl =
    element dl {
        [ a:defaultValue = "normal" ]
        attribute spacing { "normal" | "compact" }?,
        [ a:defaultValue = "false" ]
        attribute hanging { "false" | "true" }?,
        (dt, dd)+
    }
dt = element dt { (text | xref | eref | iref | cref | tt | b | i)* }
dd =
    element dd {
        (text
        | ol
        | ul
        | figure
        | artwork
        | xref
        | eref
        | iref
        | cref
        | tt
        | b
        | i)*
    }
xref =
    element xref {
        attribute target { xsd:IDREF },
        [ a:defaultValue = "false" ] attribute pageno { "true" | "false"
    }?,
        [ a:defaultValue = "default" ]
        attribute format { "counter" | "title" | "none" | "default" }?,
        attribute section { text }?,
        text
    }
eref =
    element eref {
        attribute target { text },
        text
    }
iref =
    element iref {
        attribute item { text },
        [ a:defaultValue = "" ] attribute subitem { text }?,
        [ a:defaultValue = "false" ]
        attribute primary { "true" | "false" }?,
        empty
    }
```





```
    }
  cref =
    element cref {
      attribute anchor { xsd:ID }?,
      attribute source { text }?,
      (text | xref | eref | b | i | tt)*
    }
  tt = element tt { (text | xref | eref | iref | cref | b | i)* }
  b = element b { (text | xref | eref | iref | cref | tt | i)* }
  i = element i { (text | xref | eref | iref | cref | b | tt)* }
  spanx =
    element spanx {
      [ a:defaultValue = "preserve" ]
      attribute xml:space { "default" | "preserve" }?,
      [ a:defaultValue = "emph" ] attribute style { text }?,
      text
    }
  vspace =
    element vspace {
      [ a:defaultValue = "0" ] attribute blankLines { text }?,
      empty
    }
  figure =
    element figure {
      attribute anchor { xsd:ID }?,
      [ a:defaultValue = "" ] attribute title { text }?,
      [ a:defaultValue = "false" ]
      attribute suppress-title { "true" | "false" }?,
      attribute src { text }?,
      [ a:defaultValue = "left" ]
      attribute align { "left" | "center" | "right" }?,
      [ a:defaultValue = "" ] attribute alt { text }?,
      [ a:defaultValue = "" ] attribute width { text }?,
      [ a:defaultValue = "" ] attribute height { text }?,
      iref*,
      preamble?,
      artwork+,
      postamble?
    }
  preamble =
    element preamble {
      (text | xref | eref | iref | cref | spanx | tt | b | i)*
    }
  artwork =
    element artwork {
      attribute xml:space { text }?,
      [ a:defaultValue = "" ] attribute name { text }?,
      [ a:defaultValue = "" ] attribute type { text }?,
```



```

    attribute src { text }?,
    [ a:defaultValue = "left" ]
    attribute align { "left" | "center" | "right" }?,
    [ a:defaultValue = "" ] attribute alt { text }?,
    [ a:defaultValue = "" ] attribute width { text }?,
    [ a:defaultValue = "" ] attribute height { text }?,
    [ a:defaultValue = "en" ] attribute xml:lang { text }?,
    text*
  }
postamble =
  element postamble {
    (text | xref | eref | iref | cref | spanx | tt | b | i)*
  }
texttable =
  element texttable {
    attribute anchor { xsd:ID }?,
    [ a:defaultValue = "" ] attribute title { text }?,
    [ a:defaultValue = "false" ]
    attribute suppress-title { "true" | "false" }?,
    [ a:defaultValue = "center" ]
    attribute align { "left" | "center" | "right" }?,
    [ a:defaultValue = "full" ]
    attribute style { "all" | "none" | "headers" | "full" }?,
    preamble?,
    ttcol+,
    c*,
    postamble?
  }
ttcol =
  element ttcol {
    attribute width { text }?,
    [ a:defaultValue = "left" ]
    attribute align { "left" | "center" | "right" }?,
    (xref | eref | iref | cref | text)*
  }
c =
  element c { (text | xref | eref | iref | cref | spanx | tt | b |
i)* }
back = element back { references*, section* }
references =
  element references {
    [ a:defaultValue = "References" ] attribute title { text }?,
    reference+
  }
reference =
  element reference {
    attribute anchor { xsd:ID },
    attribute target { text }?,

```



```
((attribute series { text },
  attribute document { text })
 | (front, (seriesInfo | format | innerRefContent |
annotation)*))
}
seriesInfo =
  element seriesInfo {
    attribute name { text },
    attribute value { text },
    empty
  }
format =
  element format {
    attribute target { text }?,
    attribute type { text },
    attribute octets { text }?,
    empty
  }
annotation =
  element annotation {
    (text | xref | eref | iref | cref | spanx | tt | b | i)*
  }
innerRefContent = element innerRefContent { (text | tt | b | i)* }
start = rfc
```

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