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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. This document obsoletes the v2 grammar described in [RFC 2629](#) and its expected followup, [draft-reschke-xml2rfc](#).

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), which has its home page at <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 ([[RFC7322](#)]) and Internet-Drafts ([[IDGUIDE](#)]).

This document obsoletes the version 2 vocabulary ("v2") [[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.

The v3 format will be used as part of the new RFC series described in [[RFC6949](#)]. The new format will be handled by one or more new processors for checking the XML and converting it to other representations. Features of the expected processors are described in [Appendix B](#).

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

In this document, the term "format" is used when describing types of documents, primarily XML and HTML. The term "representation" is used when talking about a specific instantiation of a format, such as an XML document or an HTML document that was created by an XML document.

The following two sections are a hopefully-complete list of all the technical changes between [[XML2RFCv2](#)] and this document, as well as the design criteria for those changes.

1.1. Design Criteria for the Changes in v3

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 representation 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 listed in [Section 1.2.3](#), and are described in [[XML2RFCv2](#)].

1.2. Differences from v2 to v3

The format changes in v3 are listed in the following subsections.

1.2.1. New Elements in v3

- o Add `<dl>`, ``, and `` as new ways to make lists. This is a significant change from v2 in that the child under these elements is ``, not `<t>`. `` has a model of either containing one or more `<t>` elements, or containing the flowing text normally found in `<t>`. These lists are children of `<section>`s and other lists instead of `<t>`.
- o Add ``, ``, ``, `<i>`, `<tt>`, `<sub>`, and `<sup>` for character formatting.
- o Add `<aside>` for incidental text that will be indented when displayed.
- o Add `<sourcecode>` to differentiate from `<artwork>`.
- o Add `<table>`, `<thead>`, `<tbody>`, `<tfoot>`, `<tr>`, `<td>`, and `<th>` to give table functionality like that in HTML.
- o Add `<boilerplate>` to hold the automatically-generated boilerplate text.
- o Add `<blockquote>` to indicate a quotation as in a paragraph-like format.
- o Add `<name>` to sections, notes, figures, and texttables to allow character formatting (fixed-width font) in their titles, and to allow references.
- o Add `<postalLine>`, free text that represents one line of the address.

- o Add <displayreference> to allow display of more mnemonic anchor names for automatically-included references.
- o Add <refcontent> to allow better control of text in a reference.
- o Add <referencegroup> to allow referemcing multi-RFC documents such as STDs and BCPS.
- o Add <link> to point to a resource related to the RFC.
- o Add
 to allow line breaks (but not blank lines) in the generated output for table cells.

1.2.2. New Attributes for Existing Elements

- o Add "sortRefs", "symRefs", "tocDepth", and "tocInclude" attributes to <rfc> to cover processor instructions (PIs) that were in v2 that are still needed in the grammar. Also add "finalizedTime" to indicate the time that the XML is published.
- o Add "ascii" attributes to <email>, <organization>, <street>, <city>, <region> and <code>. Also add "asciiFullname", "asciiInitials", and "asciiSurname" to <author>. 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.
- o Add "xml:lang" attribute to <artwork>, <postal>, <author>, and <organization>. This is sometimes useful for renderers which display different fonts for ideographic characters used in China and Japan.
- o Add the "section", "relative", and "sectionFormat" attributes to <xref>.
- o Add the "numbered" and "removeInRFC" attributes to <section>.
- o Add the "removeInRFC" attribute to <note>.
- o Add "pn" to <artwork>, <aside>, <blockquote>, <dt>, <figure>, , <section> <sourcecode>, <t>, and <table> to hold automatically generated numbers for items in a section that don't have their own numbering (namely figures and tables).
- o Add "display" to <cref> to indicate to processors whether or not to display the comment.

- o Add "keepwithnext" and "keepwithprevious" to <t> as a hint to processors that do pagination that they should try to keep the paragraph with the next/previous element.

1.2.3. Elements and Attributes Deprecated from v2

Deprecated elements and attributes are legacy vocabulary from v2 that are supported for input to v3 processors. They are likely to be removed from those processors in the future. Instead of being listed in [Section 2](#), they are listed in [Section 3](#). See [Appendix B](#) for more information on processors and how they will handle deprecated features.

- o Deprecate <list> in favor of <dl>, , and .
- o Deprecate <spanx>; replace it with , , , <i>, and <tt>.
- o Deprecate <vspace> because the major use for it, creating pseudo-paragraph-breaks in lists, is now handled properly.
- o Deprecate <texttable>, <ttable>, and <c>; replace them with the new table elements (<table> and the elements that can be contained within it).
- o Deprecate <facsimile> because it is rarely used and is not actually useful; <email> is a much more useful way to get in touch with authors.
- o Deprecate <format> because it is not useful and has caused surprise for authors in the past. If the goal is to provide a single URI (Uniform Resource Identifier) for a reference, use the "target" attribute on <reference> instead.
- o Deprecate <preamble> and <postamble> in favor of simply using <t> before or after the figure. This also deprecates the "align" attribute in <figure>.
- o Deprecate the "title" attribute in <section>, <note>, <figure>, and <texttable> in favor of the new <name>.
- o Deprecate the "alt", and "src" attributes in <figure> because they overlap with the attributes in <artwork>.
- o Deprecate the "xml:space" attribute in <artwork> because there was only one useful value. Deprecate "height" and "width" attribute in both <artwork> and <figure> because they are not needed for the new output formats.

- o Deprecate the "pageno" attribute in <xref> because it was unused in v2. Deprecate the "none" and "title" values for the "format" attribute in <xref> because the former makes no sense semantically and the latter because it has unpredictable output.

1.2.4. Additional Changes from v2

- o Allow non-ASCII characters in the format; the characters that are actually allowed will be determined by the RFC Editor.
- o Allow <artwork> and <sourcecode> to be used on their own in <section> (no longer confine them to a figure).
- o Give more specifics of handling the "type" attribute in <artwork>.
- o Allow , , , <i>, <tt>, <eref>, and <xref> in <cref>.
- o Allow the sub-elements inside a <reference> to be in any order.
- o Turned off the auto-generation of anchors in <cref> because there is no use case for them that cannot be achieved in other ways.
- o Allow more than one <artwork>, or more than one <sourcecode>, in <figure>.
- o In <front>, make <date> optional.
- o In <postal>, allow the sub-elements to be in any order. Also allow the inclusion of the new <postalLine> instead of the older elements.
- o In <references>, now require <name> to give the section name.
- o In <section>, restricted the names of the anchors that can be used on some types of sections.
- o Made <seriesInfo> a child of <front>, and deprecated it as a child of <reference>. This also deprecates some of the attributes from <rfc> and moves them into <seriesInfo>.
- o <t> now only contains non-block elements, so it no longer contains <figure> elements.
- o Do not generate the grammar from a DTD, but instead get it directly from the Relax Next Generation (RNG) grammar [[RNG](#)].

1.3. Syntax Notation

The XML vocabulary here is defined in prose, based on the Relax NG schema ([\[RNC\]](#)) contained in [Appendix C](#) (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 [\[XML\]](#)), additionally constrained to US-ASCII characters ([\[USASCII\]](#)). Thus, the character repertoire consists of "A-Z", "a-z", "0-9", "_", "-", ".", and ":", where "0-9", ".", and "-" are disallowed as start character. Anchors are described in more detail in [Appendix B.2](#).

Except inside `<artwork>` and `<sourcecode>`, horizontal whitespace and linebreaks are collapsed into a single whitespace, and leading and trailing whitespace are trimmed off.

2.1. <abstract>

Contains the abstract of the document. See [\[RFC7322\]](#) for more information on restrictions for the abstract.

This element appears as a child element of: `<front>` ([Section 2.27](#)).

Content model:

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

2.1.1. 'pn' attribute

The name for the abstract. See [Appendix B.2.1](#) for a description of this.

2.2. <address>

Provides address information for the author.

This element appears as a child element of: <author> ([Section 2.7](#)).

Content model:

In this order:

1. One optional <postal> element ([Section 2.39](#))
2. One optional <phone> element ([Section 2.38](#))
3. One optional <facsimile> element ([Section 3.2](#))
4. One optional <email> element ([Section 2.24](#))
5. One optional <uri> element ([Section 2.65](#))

[2.3.](#) <annotation>

Provides additional prose augmenting a bibliographical reference.

This element appears as a child element of: <reference> ([Section 2.42](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <spanx> elements ([Section 3.7](#))
- o elements ([Section 2.51](#))

- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

2.3.1. 'ascii' attribute

The ASCII equivalent of the annotation.

2.4. <area>

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

The value ought to be either the full name or the abbreviation of one of the IETF areas as listed on <http://www.ietf.org/iesg/area.html>. The list at the time that this document is being published is: "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 a child element of: <front> ([Section 2.27](#)).

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 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 SVG, using a URI. In this case, the textual content acts as fallback for output representations 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.

If the artwork includes either "&" or "<" characters, or the string "]]>" those characters need to be encoded using escaping or CDATA block(s); see `<sourcecode>` for a fuller description of these solutions.

In [[XML2RFCv2](#)], the `<artwork>` element was also used for source code and formal languages; in v3, this is now done with `<sourcecode>`.

There are at least four ways to include SVG in artwork in Internet Drafts:

- o Inline, by including all of the SVG in the content of the element (such as "`<artwork type='svg'><svg xmlns...'>`")
- o Inline, but using XInclude (see [Appendix B.1](#) (such as "`<artwork type='svg'><xi:include href=...'>`")
- o As a data: URI (such as "`<artwork type='svg' src='data:image/svg+xml,%3Csvg%20xmlns%3D%22http%3A%2F%2Fwww.w3...'>`")
- o As a URI to an external entity (such as "`<artwork type='svg' src='http://www.example.com/...'>`")

These four methods can also be used for including text artwork, but using a data: URI is probably confusing for text artwork.

This element appears as a child element of: `<aside>` ([Section 2.6](#)), `<blockquote>` ([Section 2.11](#)), `<figure>` ([Section 2.26](#)), `<section>` ([Section 2.47](#)), `<td>` ([Section 2.57](#)), and `<th>` ([Section 2.59](#)).

Content model:

Text

2.5.1. 'align' attribute

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

Allowed values:

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

[2.5.2.](#) 'alt' attribute

Alternative text description of the artwork (which is more than just a summary or caption). This is primarily used with artwork that is text-based. When the art comes from the "src" attribute, and the format of that artwork supports alternate text, the alternative text comes from the text of the artwork itself.

[2.5.3.](#) 'anchor' attribute

Document-wide unique identifier for this artwork.

[2.5.4.](#) 'height' attribute

Deprecated.

[2.5.5.](#) '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 artwork).

[2.5.6.](#) 'pn' attribute

The number for this artwork within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

[2.5.7.](#) 'src' attribute

The URI reference of a graphics file ([\[RFC3986\]](#)).

Note that this can be a "data" URI ([\[RFC2397\]](#)).

[2.5.8.](#) 'type' attribute

Specifies the type of the artwork. The value of this attribute is free text with certain values designated as preferred. A private processor (as described in [Appendix B](#)) might add type-specific formatting to artwork with the preferred values. If a processor encounters a value for "type" that is not one of the preferred values, it can issue a warning but should still use the artwork as if it had no "type" attribute.

The preferred values for <artwork> types are:

- o `ascii-art`
- o `call-flow`
- o `hex-dump`
- o `svg`

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.

[2.5.9.](#) `'width'` attribute

Deprecated.

[2.5.10.](#) `'xml:lang'` attribute

Allows specification of the language used. This is sometimes useful for renderers which display different fonts for ideographic characters used in China and Japan.

[2.5.11.](#) `'xml:space'` attribute

Deprecated.

[2.6.](#) `<aside>`

This element is a container for content that is semantically less important or tangential to the content that surrounds it.

This element appears as a child element of: `<section>` ([Section 2.47](#)).

Content model:

In any order:

- o `<artwork>` elements ([Section 2.5](#))
- o `<dl>` elements ([Section 2.21](#))
- o `<figure>` elements ([Section 2.26](#))
- o `<iref>` elements ([Section 2.29](#))
- o `<list>` elements ([Section 3.4](#))

- o `` elements ([Section 2.36](#))
- o `<t>` elements ([Section 2.54](#))
- o `<table>` elements ([Section 2.55](#))
- o `` elements ([Section 2.64](#))

2.6.1. 'anchor' attribute

Document-wide unique identifier for this aside.

2.6.2. 'pn' attribute

The number for this aside within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

2.7. `<author>`

Provides information about a document's author. This is used both for the document itself (at the beginning of the document) and for referenced documents.

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 [[RFC7322](#)]).

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 a child element of: `<front>` ([Section 2.27](#)).

Content model:

In this order:

1. One optional `<organization>` element ([Section 2.37](#))

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

[2.7.1.](#) 'asciiFullname' attribute

The ASCII equivalent of the author's full name.

[2.7.2.](#) 'asciiInitials' attribute

The ASCII equivalent of the author's initials.

[2.7.3.](#) 'asciiSurname' attribute

The ASCII equivalent of the author's surname.

[2.7.4.](#) 'fullname' attribute

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

[2.7.5.](#) 'initials' attribute

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

The value contains one or more initials, each followed by a period. Initials should be provided as a whitespace separated list of pairs of a letter and a dot.

[2.7.6.](#) 'role' attribute

Specifies the role the author had in creating the document.

Allowed values:

- o "editor"

[2.7.7.](#) 'surname' attribute

The author's surname (used on the front page and in references).

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

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

[2.8.](#)

Causes the text to be displayed in bold. It is almost always a better idea to use the element instead. This element can be

combined with other character formatting elements, and the formatting will be additive.

This element appears as a child element of: <annotation> ([Section 2.3](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

[2.9.](#) <back>

Contains the "back" part of the document: the references and appendices. In <back>, <section> elements indicate appendices.

This element appears as a child element of: <rfc> ([Section 2.46](#)).

Content model:

In this order:

1. Optional <displayreference> elements ([Section 2.20](#))
2. Optional <references> elements ([Section 2.44](#))
3. Optional <section> elements ([Section 2.47](#))

[2.10.](#) <bcp14>

Marks text that are phrases defined in [BCP 14](#) such as "MUST", "SHOULD NOT", and so on. When shown in some of the output representations, the text in this element might be highlighted. The use of this element is optional.

This element is only to be used around the actual phrase from [BCP 14](#), not the full definition of a requirement. For example, it is correct to say "The packet <bcp14>MUST</bcp14> be dropped.", but it not correct to say "<bcp14>The packet MUST be dropped.</bcp14>".

This element appears as a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model: only text content.

[2.11.](#) <blockquote>

Specifies a block of text is a quotation.

This element appears as a child element of: <section> ([Section 2.47](#)).

Content model:

In any order:

- o Text
- o <artwork> elements ([Section 2.5](#))
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))

- o `` elements ([Section 2.23](#))
- o `<figure>` elements ([Section 2.26](#))
- o `<i>` elements ([Section 2.28](#))
- o `<sourcecode>` elements ([Section 2.49](#))
- o `` elements ([Section 2.51](#))
- o `<sub>` elements ([Section 2.52](#))
- o `<sup>` elements ([Section 2.53](#))
- o `<t>` elements ([Section 2.54](#))
- o `<tt>` elements ([Section 2.63](#))

2.11.1. 'anchor' attribute

Document-wide unique identifier for this quotation.

2.11.2. 'cite' attribute

The source of the citation. This must be a URI. If the `quotedFrom` attribute is given, this URI will be used by processors as the link for the text of that attribute.

2.11.3. 'pn' attribute

The number for this blockquote within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

2.11.4. 'quotedFrom' attribute

Name of person or document the text in this element is quoted from. This will be rendered by the processor as visible text at the end of the quotation.

2.12. `<boilerplate>`

Holds the boilerplate text for the document. This section is filled in by the RFC Processor.

This element appears as a child element of: `<front>` ([Section 2.27](#)).

Content model:

One or more <section> elements ([Section 2.47](#))

[2.13.](#)

Indicates that a line break should be inserted in the generated output by the processor. Multiple successive instances of this element does not cause blank lines to appear in the output, and is thus not useful.

This element appears as a child element of: <td> ([Section 2.57](#)), and <th> ([Section 2.59](#)).

Content model: this element does not have any contents.

[2.14.](#) <city>

Gives the city name in a postal address.

This element appears as a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

[2.14.1.](#) 'ascii' attribute

The ASCII equivalent of the city name.

[2.15.](#) <code>

Gives the postal region code.

This element appears as a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

[2.15.1.](#) 'ascii' attribute

The ASCII equivalent of the postal code.

[2.16.](#) <country>

Gives the country in a postal address.

This element appears as a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

2.17. <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 representation and settings of the processor), or not at all (when generating an RFC).

This element appears as a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <c> ([Section 3.1](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <name> ([Section 2.34](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), <tt> ([Section 2.63](#)), and <ttcol> ([Section 3.9](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

2.17.1. 'anchor' attribute

Document-wide unique identifier for this comment.

[2.17.2.](#) 'display' attribute

Says whether or not the the comment should be displayed by processors. This might be set to "false" if you want to keep a comment in a document after the contents of the comment have already been dealt with.

Allowed values:

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

[2.17.3.](#) 'source' attribute

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

[2.18.](#) <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 that use the <front> element.

In the boilerplate case, it defines the date of publication for the current document (Internet Draft or RFC). When producing Internet-Drafts, the Draft Processor uses this date to compute the expiration date (see [[IDGUIDE](#)]). When one or more of "year", "month", or "day" are left out, the processor will attempt to use the current system date if the attributes that are present are consistent with that date.

Also in the first case, that month names, if given, need to match the full English month name: "January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", or "December".

In the case of bibliographic references, the date information can have prose text for the month or year. For example, vague dates (year="ca. 2000"), date ranges (year="2012-2013"), non-specific months (month="Second quarter") and so on, are allowed.

This element appears as a child element of: <front> ([Section 2.27](#)).

Content model: this element does not have any contents.

[2.18.1.](#) 'day' attribute

In the "boilerplate" case: the day of publication; this is a number. Otherwise: an indication of the publication day, with the format not being restricted.

[2.18.2.](#) 'month' attribute

In the "boilerplate" case: the month of publication; this is the English name of the month. Otherwise: an indication of the publication month, with the format not being restricted.

[2.18.3.](#) 'year' attribute

In the "boilerplate" case: the year of publication; this is a number (usually four-digit). Otherwise: an indication of the publication year, with the format not being restricted.

[2.19.](#) <dd>

The definition part of an entry in a definition list.

This element appears as a child element of: <dl> ([Section 2.21](#)).

Content model:

Either:

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

Or:

In any order, but at least one of:

- * Text
- * elements ([Section 2.8](#))
- * <bcp14> elements ([Section 2.10](#))
- * <cref> elements ([Section 2.17](#))
- * elements ([Section 2.23](#))
- * <eref> elements ([Section 2.25](#))
- * <i> elements ([Section 2.28](#))

- * <iref> elements ([Section 2.29](#))
- * elements ([Section 2.51](#))
- * <sub> elements ([Section 2.52](#))
- * <sup> elements ([Section 2.53](#))
- * <tt> elements ([Section 2.63](#))
- * <xref> elements ([Section 2.67](#))

2.20. <displayreference>

This element gives a mapping between the anchor of a reference and a name that will be displayed instead. This allows authors to display more mnemonic anchor names for automatically-included references. For example, if the reference uses the anchor "[RFC6949](#)", the following would cause that anchor in the body of displayed documents to be "RFC-dev":

```
<displayreference from="RFC6449" to="RFC-dev"/>
```

If a reference section is sorted, this element changes the sort order.

This element appears as a child element of: <back> ([Section 2.9](#)).

Content model: this element does not have any contents.

2.20.1. 'target' attribute (mandatory)

This attribute must be the name of an anchor in a <reference> element.

2.20.2. 'to' attribute (mandatory)

This attribute is a name that will be displayed as the anchor instead of the anchor that is given in the <reference> element. The string given must start with one of the following characters: 0-9, a-z, A-Z. The other characters in the string must be 0-9, a-z, A-Z, "-", ".", and "_".

2.21. <dl>

A definition list. Each entry has a pair of elements: a term (<dt>) and a definition (<dd>). (This is slightly different than the model used in HTML, which allows for multiple terms for a single

definition.)

This element appears as a child element of: <aside> ([Section 2.6](#)), <section> ([Section 2.47](#)), <td> ([Section 2.57](#)), and <th> ([Section 2.59](#)).

Content model:

One or more sequences of:

1. One <dt> element
2. One <dd> element

2.21.1. 'hanging' attribute

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

Allowed values:

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

2.21.2. '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"

2.22. <dt>

The term being defined in a definition list.

This element appears as a child element of: <dl> ([Section 2.21](#)).

Content model:

In any order:

- o Text
- o `` elements ([Section 2.8](#))
- o `<bcp14>` elements ([Section 2.10](#))
- o `<cref>` elements ([Section 2.17](#))
- o `` elements ([Section 2.23](#))
- o `<eref>` elements ([Section 2.25](#))
- o `<i>` elements ([Section 2.28](#))
- o `<iref>` elements ([Section 2.29](#))
- o `` elements ([Section 2.51](#))
- o `<sub>` elements ([Section 2.52](#))
- o `<sup>` elements ([Section 2.53](#))
- o `<tt>` elements ([Section 2.63](#))
- o `<xref>` elements ([Section 2.67](#))

2.22.1. 'anchor' attribute

Document-wide unique identifier for this term.

2.22.2. 'pn' attribute

The number for this term within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

2.23. ``

Indicates text that is semantically emphasized. This element will be displayed as italic after processing. This element has the same effects as `<i>`.

This element appears as a child element of: `<annotation>` ([Section 2.3](#)), `` ([Section 2.8](#)), `<blockquote>` ([Section 2.11](#)), `<c>` ([Section 3.1](#)), `<cref>` ([Section 2.17](#)), `<dd>` ([Section 2.19](#)), `<dt>` ([Section 2.22](#)), `` ([Section 2.31](#)), `<postamble>` ([Section 3.5](#)), `<preamble>` ([Section 3.6](#)), `<refcontent>` ([Section 2.41](#)), `` ([Section 2.51](#)), `<sub>` ([Section 2.52](#)), `<sup>` ([Section 2.53](#)), `<t>`

([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o <eref> elements ([Section 2.25](#))
- o <iref> elements ([Section 2.29](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

2.24. <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 a child element of: <address> ([Section 2.2](#)).

Content model: only text content.

2.24.1. '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.

[2.25.](#) `<eref>`

Represents an "external" link (as specified in the "target" attribute). This can be used for creating linked references, such as in HTML output.

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 a child element of: `<annotation>` ([Section 2.3](#)), `` ([Section 2.8](#)), `<c>` ([Section 3.1](#)), `<eref>` ([Section 2.17](#)), `<dd>` ([Section 2.19](#)), `<dt>` ([Section 2.22](#)), `` ([Section 2.23](#)), `<i>` ([Section 2.28](#)), `` ([Section 2.31](#)), `<name>` ([Section 2.34](#)), `<postamble>` ([Section 3.5](#)), `<preamble>` ([Section 3.6](#)), `` ([Section 2.51](#)), `<sub>` ([Section 2.52](#)), `<sup>` ([Section 2.53](#)), `<t>` ([Section 2.54](#)), `<td>` ([Section 2.57](#)), `<th>` ([Section 2.59](#)), `<tt>` ([Section 2.63](#)), and `<ttcol>` ([Section 3.9](#)).

Content model: only text content.

[2.25.1.](#) 'target' attribute (mandatory)

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

[2.26.](#) `<figure>`

Contains a figure with a caption with the figure number. If the element contains a `<name>` element, the caption will also show that name.

This element appears as a child element of: `<aside>` ([Section 2.6](#)), `<blockquote>` ([Section 2.11](#)), `<section>` ([Section 2.47](#)), `<td>` ([Section 2.57](#)), and `<th>` ([Section 2.59](#)).

Content model:

In this order:

1. One optional `<name>` element ([Section 2.34](#))
2. Optional `<iref>` elements ([Section 2.29](#))
3. One optional `<preamble>` element ([Section 3.6](#))
4. In any order, but at least one of:

- * <artwork> elements ([Section 2.5](#))
- * <sourcecode> elements ([Section 2.49](#))

5. One optional <postamble> element ([Section 3.5](#))

[2.26.1.](#) 'align' attribute

Deprecated.

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

Allowed values:

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

[2.26.2.](#) 'alt' attribute

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

[2.26.3.](#) 'anchor' attribute

Document-wide unique identifier for this figure.

[2.26.4.](#) 'height' attribute

Deprecated.

[2.26.5.](#) 'pn' attribute

The number for this figure. This attribute and its value are automatically generated by the RFC Processor.

[2.26.6.](#) 'src' attribute

Deprecated.

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

Deprecated. Figures always now get captions.

Allowed values:

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

[2.26.8.](#) 'title' attribute

Deprecated. Use <name> instead.

[2.26.9.](#) 'width' attribute

Deprecated.

[2.27.](#) <front>

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

A <front> element may have more than one <seriesInfo> elements. A <seriesInfo> element determines the document number (for RFCs) or name (for Internet-Drafts). Another <seriesInfo> element determines the "maturity level" (see [Section 4 of \[RFC2026\]](#)), using values of "std" for "Standards Track", "bcp" for "BCP", "info" for "Informational", "exp" for "Experimental", and "historic" for "Historic". The "name" attributes of those multiple <seriesInfo> elements interact as described in the section on <seriesInfo>.

This element appears as a child element of: <reference> ([Section 2.42](#)), and <rftc> ([Section 2.46](#)).

Content model:

In this order:

1. One <title> element ([Section 2.61](#))
2. One or more <author> elements ([Section 2.7](#))
3. One optional <date> element ([Section 2.18](#))
4. Optional <area> elements ([Section 2.4](#))
5. Optional <workgroup> elements ([Section 2.66](#))
6. Optional <keyword> elements ([Section 2.30](#))
7. One optional <abstract> element ([Section 2.1](#))

8. Optional <seriesInfo> elements ([Section 2.48](#))
9. Optional <note> elements ([Section 2.35](#))
10. One optional <boilerplate> element ([Section 2.12](#))

[2.28.](#) <i>

Causes the text to be displayed in italic. It is almost always a better idea to use the element instead.

This element appears as a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o <eref> elements ([Section 2.25](#))
- o <iref> elements ([Section 2.29](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

2.29. <iref>

Provides terms for the document's index.

Index entries can be either be regular entries (when just the "item" attribute is given) or nested entries (by specifying "subitem" as well), grouped under a regular entry.

Index entries generally refer to the exact place where the <iref> element occurred. An exception is the occurrence as a child element of <section>, in which case the whole section is considered to be relevant for that index entry. In some formats, index entries of this type might be displayed as range.

This element appears as a child element of: <annotation> ([Section 2.3](#)), <aside> ([Section 2.6](#)), ([Section 2.8](#)), <c> ([Section 3.1](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <figure> ([Section 2.26](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <section> ([Section 2.47](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <table> ([Section 2.55](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), <tt> ([Section 2.63](#)), and <ttcol> ([Section 3.9](#)).

Content model: this element does not have any contents.

2.29.1. 'item' attribute (mandatory)

The item to include.

2.29.2. '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)

2.29.3. 'subitem' attribute

The subitem to include.

[2.30.](#) `<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 representations.

This element appears as a child element of: `<front>` ([Section 2.27](#)).

Content model: only text content.

[2.31.](#) ``

A list element, used in `` and ``.

This element appears as a child element of: `` ([Section 2.36](#)), and `` ([Section 2.64](#)).

Content model:

Either:

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

Or:

In any order, but at least one of:

- * Text
- * `` elements ([Section 2.8](#))
- * `<bcp14>` elements ([Section 2.10](#))
- * `<cref>` elements ([Section 2.17](#))
- * `` elements ([Section 2.23](#))
- * `<eref>` elements ([Section 2.25](#))
- * `<i>` elements ([Section 2.28](#))
- * `<iref>` elements ([Section 2.29](#))

- * elements ([Section 2.51](#))
- * <sub> elements ([Section 2.52](#))
- * <sup> elements ([Section 2.53](#))
- * <tt> elements ([Section 2.63](#))
- * <xref> elements ([Section 2.67](#))

2.31.1. 'anchor' attribute

Document-wide unique identifier for this list item.

2.31.2. 'pn' attribute

The number for this list item within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

2.32. <link>

A link to an external document that is related to the RFC.

The following are the supported types of external documents that can be pointed to in a <link> element:

- o The current ISSN for the RFC Series. The value for the "rel" attribute is "item". The link should use the form "urn:issn:".
- o The DOI for this document. The value for the "rel" attribute is "describedBy". The link should use the form specified in [[DOI](#)].
- o The Internet Draft that was submitted to the RFC Editor to become the published RFC. The value for the "rel" attribute is "derivedFrom". The link should be to an IETF-controlled web site that retains copies of Internet Drafts.
- o A representation of the document offered by the document author. The value for the "rel" attribute is "alternate". The link can be to a personally-run web site.

The RFC Processor needs to check the values for <link> before an RFC is published. The Draft Processor might remove some <link> elements during the draft submission process.

This element appears as a child element of: <rfc> ([Section 2.46](#)).

Content model: this element does not have any contents.

[2.32.1.](#) 'href' attribute (mandatory)

The URI of the external document.

[2.32.2.](#) 'rel' attribute

The relationship of the external document to this one. The relationships are taken from Link Relations registry maintained by IANA [[LINKRELATIONS](#)].

[2.33.](#) <middle>

Represents the main content of the document.

This element appears as a child element of: <rfc> ([Section 2.46](#)).

Content model:

One or more <section> elements ([Section 2.47](#))

[2.34.](#) <name>

The name of the section, note, figure, or texttable. This name can have flow markup such as to make some characters use a fixed-width font, or to include references.

This element appears as a child element of: <figure> ([Section 2.26](#)), <note> ([Section 2.35](#)), <references> ([Section 2.44](#)), <section> ([Section 2.47](#)), <table> ([Section 2.55](#)), and <texttable> ([Section 3.8](#)).

Content model:

In any order:

- o Text
- o <cref> elements ([Section 2.17](#))
- o <eref> elements ([Section 2.25](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

[2.34.1.](#) 'slugifiedName' attribute

This attribute is filled in by a processor with a "slugified" version of the text in the element. This attribute can be used in the output formats for elements that have both names and numbers.

[2.35.](#) <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 a child element of: <front> ([Section 2.27](#)).

Content model:

In this order:

1. One <name> element ([Section 2.34](#))
2. One or more <t> elements ([Section 2.54](#))

[2.35.1.](#) 'pn' attribute

The name for this note. See [Appendix B.2.1](#) for a description of this.

[2.35.2.](#) 'removeInRFC' attribute

If set to "yes", this note 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)

[2.35.3.](#) 'title' attribute

Deprecated. Use <name> instead.

**2.36. **

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 a child element of: <aside> ([Section 2.6](#)), <section> ([Section 2.47](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), and <th> ([Section 2.59](#)).

Content model:

One or more elements ([Section 2.31](#))

2.36.1. 'group' attribute

When a processor sees an element with a "group" attribute that has already been seen, the processor continues the numbering of the list from where the previous list with the same group name left off. If an element has both a "group" and "start" attribute, the group's numbering is reset to the given start value.

2.36.2. '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"

2.36.3. 'start' attribute

The ordinal value to start the list at. This defaults to "1", and must be an integer of 0 or greater.

2.36.4. '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, ...)

For style "a" and "A", after the 26th entry, the numbering starts at "aa"/"AA", then "ab"/"AB", and so on.

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.

It is an error for the style string to be empty, and processors will reject documents with an element that has such a style. For bulleted lists, you use the element. For lists that have neither bullets nor numbers, use the element with the 'empty="true"' attribute.

If no "style" attribute is given, the default style is the same as "style='%d.'".

2.37. <organization>

Specifies the affiliation of an author.

This information appears in both the "Author's Address" section and on the front page (see [RFC7322](#) for more information). If the value

is long, an abbreviated variant can be specified in the "abbrev" attribute.

This element appears as a child element of: <author> ([Section 2.7](#)).

Content model: only text content.

[2.37.1.](#) 'abbrev' attribute

Abbreviated variant.

[2.37.2.](#) 'ascii' attribute

The ASCII equivalent of the organization's name.

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

Allows specification of the language used. This is sometimes useful for renderers which display different fonts for ideographic characters used in China and Japan.

[2.38.](#) <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 a child element of: <address> ([Section 2.2](#)).

Content model: only text content.

[2.39.](#) <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 a child element of: <address> ([Section 2.2](#)).

Content model:

Either:

In any order:

- * <city> elements ([Section 2.14](#))
- * <code> elements ([Section 2.15](#))
- * <country> elements ([Section 2.16](#))
- * <region> elements ([Section 2.45](#))
- * <street> elements ([Section 2.50](#))

Or:

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

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

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

[2.40.](#) <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 a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

[2.40.1.](#) 'ascii' attribute

The ASCII equivalent of the text in the address line.

[2.41.](#) <refcontent>

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.

For example:

```
<reference anchor="April1">
  <front>
    <title>On Being A Fool</title>
    <author initials="K." surname="Phunny" fullname="Knot Phunny"/>
    <date year="2000" month="April"/>
  </front>
  <refcontent>Self-published pamphlet</refcontent>
</reference>
```

would render as:

```
[April1]      Phunny, K., "On Being A Fool", Self-published
              pamphlet, April 2000.
```

This element appears as a child element of: <reference> ([Section 2.42](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o elements ([Section 2.23](#))
- o <i> elements ([Section 2.28](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))

[2.41.1.](#) 'ascii' attribute

The ASCII equivalent of the added text.

[2.42.](#) <reference>

Represents a bibliographical reference.

This element appears as a child element of: <referencegroup>

([Section 2.43](#)), and <references> ([Section 2.44](#)).

Content model:

In this order:

1. One <front> element ([Section 2.27](#))
2. In any order:
 - * <annotation> elements ([Section 2.3](#))
 - * <format> elements ([Section 3.3](#))
 - * <refcontent> elements ([Section 2.41](#))
 - * <seriesInfo> elements ([Section 2.48](#); deprecated in this context)

2.42.1. '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.

2.42.2. 'target' attribute

Holds the URI for the reference.

2.43. <referencegroup>

Represents a list of bibliographic references that will be represented as a single reference. This is most often used for references in the STD and BCP series, where a single reference (such as "[BCP 9](#)") encompasses more than one RFC.

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

Content model:

One or more <reference> elements ([Section 2.42](#))

2.43.1. 'anchor' attribute (mandatory)

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

entry.

2.44. <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 [[RFC7322](#)]). This vocabulary supports the split with the <name> child element. In general, the title should be either "Normative References" or "Informative References".

By default, the order of references is significant. Processors, however, can be instructed to sort them based on their anchor names.

This element appears as a child element of: <back> ([Section 2.9](#)).

Content model:

In this order:

1. One <name> element ([Section 2.34](#))
2. In any order:
 - * <reference> elements ([Section 2.42](#))
 - * <referencegroup> elements ([Section 2.43](#))

2.44.1. 'anchor' attribute (mandatory)

The number for this section. This attribute and its value are automatically generated by the RFC Processor, and are ignored by other processors.

2.45. <region>

Provides the region name in a postal address.

This element appears as a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

2.45.1. 'ascii' attribute

The ASCII equivalent of the region name.

2.46. <rfc>

This is the root element of the xml2rfc vocabulary.

Content model:

In this order:

1. Optional <link> elements ([Section 2.32](#))
2. One <front> element ([Section 2.27](#))
3. One <middle> element ([Section 2.33](#))
4. One optional <back> element ([Section 2.9](#))

2.46.1. 'category' attribute

Deprecated; instead, use the "name" attribute in <seriesInfo>.

2.46.2. 'consensus' attribute

Affects the generated boilerplate.

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

Allowed values:

- o "no"
- o "yes"

2.46.3. 'docName' attribute

Deprecated; instead, use the "value" attribute in <seriesInfo>.

2.46.4. 'finalizedTime' attribute

The date that the XML was finalized by the RFC Editor when publishing an RFC. This is included in the XML file just before publication, and is stripped by processors from all other XML files. The value is formatted using the format from [[RFC3339](#)].

2.46.5. 'ipr' attribute

Represents the Intellectual Property status of the document. See [Appendix A.1](#) 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"

2.46.6. 'iprExtract' attribute

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

2.46.7. 'number' attribute

Deprecated; instead, use the "value" attribute in <seriesInfo>.

2.46.8. 'obsoletes' attribute

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

Processors ought to parse the attribute value, so that incorrect references can be detected and, depending on output representation, hyperlinks can be generated. Also, the value ought to be reformatted to insert whitespace after each comma if not already present.

2.46.9. 'seriesNo' attribute

Deprecated; instead, use the "value" attribute in <seriesInfo>.

2.46.10. 'sortRefs' attribute

Specifies whether or not a processor will sort the references in each reference section.

Allowed values:

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

2.46.11. 'submissionType' attribute

The document stream.

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

Allowed values:

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

2.46.12. 'symRefs' attribute

Specifies whether or not a processor will use symbolic references (such as "[\[RFC2119\]](#)"). If the value for this is "no", the references come out as numbers (such as "[3]").

Allowed values:

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

2.46.13. 'tocDepth' attribute

Specifies number of levels of heading for a processor to include in the table of contents; the default is "3".

2.46.14. 'tocInclude' attribute

Specifies whether or not a processor will include a table of contents in generated files.

Allowed values:

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

2.46.15. 'updates' attribute

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

Processors ought to parse the attribute value, so that incorrect references can be detected and, depending on output representation, hyperlinks can be generated. Also, the value ought to be reformatted to insert whitespace after each comma if not already present.

2.46.16. 'xml:lang' attribute

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

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

2.47. <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. Sections are allowed to be empty.

This element appears as a child element of: <back> ([Section 2.9](#)), <boilerplate> ([Section 2.12](#)), <middle> ([Section 2.33](#)), and <section> ([Section 2.47](#)).

Content model:

In this order:

1. One optional <name> element ([Section 2.34](#))
2. In any order:
 - * <artwork> elements ([Section 2.5](#))
 - * <aside> elements ([Section 2.6](#))
 - * <blockquote> elements ([Section 2.11](#))
 - * <dl> elements ([Section 2.21](#))
 - * <figure> elements ([Section 2.26](#))
 - * <iref> elements ([Section 2.29](#))
 - * elements ([Section 2.36](#))
 - * <sourcecode> elements ([Section 2.49](#))
 - * <t> elements ([Section 2.54](#))
 - * <table> elements ([Section 2.55](#))
 - * <texttable> elements ([Section 3.8](#))
 - * elements ([Section 2.64](#))
3. Optional <section> elements ([Section 2.47](#))

2.47.1. 'anchor' attribute

Document-wide unique identifier for this section.

2.47.2. '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"

2.47.3. 'pn' attribute

The number for this section, if one is generated by the processor. This attribute and its value are automatically generated by the RFC Processor, and are ignored by other processors.

2.47.4. 'removeInRFC' attribute

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

Allowed values:

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

2.47.5. 'title' attribute

Deprecated. Use <name> instead. Processors will flag sections that have no <name> element as errors because all sections need a name.

2.47.6. 'toc' attribute

Indicates to a processor whether or not the section is to be included in the table of contents. This only takes effect if the level of the section would have appeared in the table of contents based on the "tocDepth" attribute of the <rfc> element, and of course only if the table of contents is being created based on the "tocInclude" attribute of the <rfc> element. If this is set to "exclude", any section below this one will be excluded as well. The "default" value indicates to include the section if it would be included by the tocDepth attribute of the <rfc> element.

Allowed values:

- o "include"
- o "exclude"
- o "default" (default)

2.48. <seriesInfo>

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

A processor determines if it is working on an RFC or an Internet-Draft by inspecting the "name" attribute of a <seriesInfo> element inside the <front> element inside the <rfc> element, looking for "rfc" or "Internet-Draft". (Specifying neither value in any of the <seriesInfo> elements can be useful for producing other types of documents, but is out-of-scope for this specification.)

It is invalid to have multiple <seriesInfo> elements inside the <front> element inside the <rfc> element that have "name" values of "rfc", or that have "name" values of "Internet-Draft", or that have both "rfc" and "Internet-Draft".

This element appears as a child element of: <front> ([Section 2.27](#)), and <reference> ([Section 2.42](#); deprecated in this context).

Content model: this element does not have any contents.

[2.48.1.](#) 'asciiName' attribute

The ASCII equivalent of the name field.

[2.48.2.](#) 'asciiValue' attribute

The ASCII equivalent of the value field.

[2.48.3.](#) 'name' attribute (mandatory)

The name of the series.

Some of the values for "name" interact as follows:

- o If a <front> element contains a <seriesInfo> element with a name of "Internet-Draft", it can also have at most one additional <seriesInfo> element with a name of "std", "bcp", "fyi", "exp", or "historic" to indicate the intended status of this Internet Draft, if it were to be later published as an RFC. If such an additional <seriesInfo> element has one of those names, the value attribute for that name MUST be "".
- o If a <front> element contains a <seriesInfo> element with a name of "rfc", it can also have at most one additional <seriesInfo> element with a name of "std", "bcp", or "fyi" to indicate the current status of this RFC. If such an additional <seriesInfo> element has one of those names, the value attribute for that name MUST be the number within that series. That <front> element might also contain an additional <seriesInfo> with the name "exp" or "historic" and a value of "" to indicate the status of the RFC.

- o A <front> element that has a <seriesInfo> element that has the name "Internet-Draft" MUST NOT also have a <seriesInfo> element that has the name "rfc".
- o The DOI for the referenced document. This MUST NOT be used when <seriesInfo> element is an eventual child element of a <rfc> element, only as an eventual child of a <reference> element. The value attribute should use the form specified in [DOI].

Other values might be added at a later time by the RFC Editor.

2.48.4. '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). For DOIs, the value is given such as "10.123456/rfc1149", (the actual value will be specified later in [DOI]).

The name in the value should be the document name without any file extension. For Internet Drafts, the value for this attribute should be "[draft-ietf-somewg-someprotocol-07](#)", not "[draft-ietf-somewg-someprotocol-07.txt](#)".

2.49. <sourcecode>

This element allows the inclusion of sourcecode into the document.

<sourcecode> provides full control of horizontal whitespace and line breaks. It is thus useful for source code and formal languages (such as ABNF or the RNC notation used in this document). When rendered, sourcecode is always shown in a monospace font.

For artwork such as character-based art, diagrams of message layouts, and so on, use the <artwork> element instead.

A common problem authors have with <sourcecode> is that the XML processor returns errors if the text in the artwork contains either the "&" or "<" character, or the string "]]>". To avoid these problems, the "&" and "<" characters may be escaped using the strings "&#" and "<#", respectively; the "]]>" string can be represented as "]]>". Alternatively, they may be surrounded in a CDATA structure: "<![CDATA[]]>". For example:

Desired output:

```
allowed-chars = "." | "," | "&" | "<" | ">" | "|"
```

Using escaping:

```
<sourcecode>
```

```
allowed-chars = "." | "," | "&#38;" | "&#3C;" | "&#3E;" | "|"
```

```
</sourcecode>
```

Using CDATA:

```
<sourcecode>
```

```
<![CDATA[ allowed-chars = "." | "," | "&" | "<" | ">" | "|"]]>
```

```
</sourcecode>
```

Using CDATA is not a panacea, but it does help prevent having to use escapes in places where using escapes can cause other problems, such as difficulty of inclusion from other documents.

This element appears as a child element of: `<blockquote>` ([Section 2.11](#)), `<figure>` ([Section 2.26](#)), `<section>` ([Section 2.47](#)), `<td>` ([Section 2.57](#)), and `<th>` ([Section 2.59](#)).

Content model: only text content.

[2.49.1.](#) 'anchor' attribute

Document-wide unique identifier for this sourcecode.

[2.49.2.](#) '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).

[2.49.3.](#) 'pn' attribute

The number for this sourcecode within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

[2.49.4.](#) 'src' attribute

The URI reference of a source file ([\[RFC3986\]](#)).

[2.49.5.](#) 'type' attribute

Specifies the type of the sourcecode. The value of this attribute is free text with certain values designated as preferred. A private

processor (as described in [Appendix B](#)) might add type-specific formatting to sourcecode with the preferred values. If a processor encounters a value for "type" that is not one of the preferred values, it can issue a warning but should still use the artwork as if it had no "type" attribute.

The preferred values for <sourcecode> types are:

- o abnf
- o asn.1
- o bash
- o c++
- o c
- o cbor
- o dtd
- o java
- o javascript
- o json
- o mib
- o perl
- o pseudocode
- o python
- o rnc
- o xml

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.

[2.50.](#) <street>

Provides a street address.

This element appears as a child element of: <postal> ([Section 2.39](#)).

Content model: only text content.

[2.50.1.](#) 'ascii' attribute

The ASCII equivalent of the street address.

[2.51.](#)

Indicates text that is semantically strong. This element will be displayed as bold after processing. This element has the same effects as . This element can be combined with other character formatting elements, and the formatting will be additive.

This element appears as a child element of: <annotation> ([Section 2.3](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <sub> elements ([Section 2.52](#))

- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

[2.52.](#) <sub>

Causes the text to be displayed as subscript, approximately half a letter-height lower than normal text. This element can be combined with other character formatting elements, and the formatting will be additive.

This element appears as a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), ([Section 2.51](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), and <tt> ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o elements ([Section 2.51](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

[2.53.](#) `<sup>`

Causes the text to be displayed as superscript, approximately half a letter-height higher than normal text. This element can be combined with other character formatting elements, and the formatting will be additive.

This element appears as a child element of: `<annotation>` ([Section 2.3](#)), `` ([Section 2.8](#)), `<blockquote>` ([Section 2.11](#)), `<c>` ([Section 3.1](#)), `<cref>` ([Section 2.17](#)), `<dd>` ([Section 2.19](#)), `<dt>` ([Section 2.22](#)), `` ([Section 2.23](#)), `<i>` ([Section 2.28](#)), `` ([Section 2.31](#)), `<postamble>` ([Section 3.5](#)), `<preamble>` ([Section 3.6](#)), `<refcontent>` ([Section 2.41](#)), `` ([Section 2.51](#)), `<t>` ([Section 2.54](#)), `<td>` ([Section 2.57](#)), `<th>` ([Section 2.59](#)), and `<tt>` ([Section 2.63](#)).

Content model:

In any order:

- o Text
- o `` elements ([Section 2.8](#))
- o `<bcp14>` elements ([Section 2.10](#))
- o `<cref>` elements ([Section 2.17](#))
- o `` elements ([Section 2.23](#))
- o `<eref>` elements ([Section 2.25](#))
- o `<i>` elements ([Section 2.28](#))
- o `<iref>` elements ([Section 2.29](#))
- o `` elements ([Section 2.51](#))
- o `<tt>` elements ([Section 2.63](#))
- o `<xref>` elements ([Section 2.67](#))

[2.54.](#) `<t>`

Contains a paragraph of text.

This element appears as a child element of: `<abstract>` ([Section 2.1](#)), `<aside>` ([Section 2.6](#)), `<blockquote>` ([Section 2.11](#)), `<dd>`

([Section 2.19](#)), `` ([Section 2.31](#)), `<list>` ([Section 3.4](#)), `<note>` ([Section 2.35](#)), `<section>` ([Section 2.47](#)), `<td>` ([Section 2.57](#)), and `<th>` ([Section 2.59](#)).

Content model:

In any order:

- o Text
- o `` elements ([Section 2.8](#))
- o `<bc14>` elements ([Section 2.10](#))
- o `<cref>` elements ([Section 2.17](#))
- o `` elements ([Section 2.23](#))
- o `<eref>` elements ([Section 2.25](#))
- o `<i>` elements ([Section 2.28](#))
- o `<iref>` elements ([Section 2.29](#))
- o `<list>` elements ([Section 3.4](#))
- o `` elements ([Section 2.36](#))
- o `<spanx>` elements ([Section 3.7](#))
- o `` elements ([Section 2.51](#))
- o `<sub>` elements ([Section 2.52](#))
- o `<sup>` elements ([Section 2.53](#))
- o `<tt>` elements ([Section 2.63](#))
- o `<vspace>` elements ([Section 3.10](#))
- o `<xref>` elements ([Section 2.67](#))

2.54.1. 'anchor' attribute

Document-wide unique identifier for this paragraph.

[2.54.2.](#) 'hangText' attribute

Deprecated. Instead use <dd> inside of a definition list (<dl>).

[2.54.3.](#) 'keepwithnext' attribute

Acts as a hint to the output formatters that do pagination to do a best effort attempt to keep the paragraph with the next element, whatever that happens to be. For example, the HTML output @media print CSS might translate this to page-break-after: avoid. For PDF, the paginator could attempt to keep the paragraph with the next element. Note: this attribute is strictly a hint and not always actionable.

[2.54.4.](#) 'keepwithprevious' attribute

Acts as a hint to the output formatters that do pagination to do a best effort attempt to keep the paragraph with the previous element, whatever that happens to be. For example, the HTML output @media print CSS might translate this to page-break-before: avoid. For PDF, the paginator could attempt to keep the paragraph with the previous element. Note: this attribute is strictly a hint and not always actionable.

[2.54.5.](#) 'pn' attribute

The number for this paragraph within the section. The numbering is shared with other elements of a section. This is described in more detail in [Appendix B.2](#).

[2.55.](#) <table>

Contains a table with a caption with the table number. If the element contains a <name> element, the caption will also show that name.

Inside the <table> element is optionally a <thead> element to contain the rows that will be the table's heading and optionally a <tfoot> element to contain the rows of the table's footer. If the XML is converted to a representation that has page breaks (such as PDFs, or printed HTML), the header and footer are meant to appear on each page.

This element appears as a child element of: <aside> ([Section 2.6](#)), and <section> ([Section 2.47](#)).

Content model:

In this order:

1. One optional <name> element ([Section 2.34](#))
2. Optional <iref> elements ([Section 2.29](#))
3. One optional <thead> element ([Section 2.60](#))
4. One or more <tbody> elements ([Section 2.56](#))
5. One optional <tfoot> element ([Section 2.58](#))

[2.55.1.](#) 'anchor' attribute

Document-wide unique identifier for this table.

[2.55.2.](#) 'pn' attribute

The number for this table. This attribute and its value are automatically generated by the RFC Processor.

[2.56.](#) <tbody>

A container for a set of body rows for a table.

This element appears as a child element of: <table> ([Section 2.55](#)).

Content model:

One or more <tr> elements ([Section 2.62](#))

[2.57.](#) <td>

A cell in a table row.

This element appears as a child element of: <tr> ([Section 2.62](#)).

Content model:

Either:

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

Or:

In any order, but at least one of:

- * Text
- * <artwork> elements ([Section 2.5](#))
- * elements ([Section 2.8](#))
- * <bcp14> elements ([Section 2.10](#))
- *
 elements ([Section 2.13](#))
- * <cref> elements ([Section 2.17](#))
- * <dl> elements ([Section 2.21](#))
- * elements ([Section 2.23](#))
- * <eref> elements ([Section 2.25](#))
- * <figure> elements ([Section 2.26](#))
- * <i> elements ([Section 2.28](#))
- * <iref> elements ([Section 2.29](#))
- * elements ([Section 2.36](#))
- * <sourcecode> elements ([Section 2.49](#))
- * elements ([Section 2.51](#))
- * <sub> elements ([Section 2.52](#))
- * <sup> elements ([Section 2.53](#))
- * <tt> elements ([Section 2.63](#))
- * elements ([Section 2.64](#))
- * <xref> elements ([Section 2.67](#))

2.57.1. 'align' attribute

Controls whether the content of the cell appears left justified (default), centered, or right justified. Note that "center" or "right" probably only work well in cells with plain text; any other elements might make the contents render badly.

Allowed values:

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

2.57.2. 'border' attribute

The width of the border for this cell. The default is 0, meaning no border.

2.57.3. 'colspan' attribute

The number of columns that the cell to span. For example, setting "colspan='3'" indicates that the cell occupies the same horizontal space as three cells in the row above or below this one.

2.57.4. 'rowspan' attribute

The number of rows that the cell to span. For example, setting "rowspan='3'" indicates that the cell occupies the same vertical space as three rows.

2.58. <tfoot>

A container for a set of footer rows for a table.

This element appears as a child element of: <table> ([Section 2.55](#)).

Content model:

One or more <tr> elements ([Section 2.62](#))

2.59. <th>

A cell in a table row. When rendered, this will normally come out in boldface; other than that, there is no difference between this and the <td> element.

This element appears as a child element of: <tr> ([Section 2.62](#)).

Content model:

Either:

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

Or:

In any order, but at least one of:

- * Text
- * <artwork> elements ([Section 2.5](#))
- * elements ([Section 2.8](#))
- * <bcp14> elements ([Section 2.10](#))
- *
 elements ([Section 2.13](#))
- * <cref> elements ([Section 2.17](#))
- * <dl> elements ([Section 2.21](#))
- * elements ([Section 2.23](#))
- * <eref> elements ([Section 2.25](#))
- * <figure> elements ([Section 2.26](#))
- * <i> elements ([Section 2.28](#))
- * <iref> elements ([Section 2.29](#))
- * elements ([Section 2.36](#))
- * <sourcecode> elements ([Section 2.49](#))
- * elements ([Section 2.51](#))
- * <sub> elements ([Section 2.52](#))
- * <sup> elements ([Section 2.53](#))
- * <tt> elements ([Section 2.63](#))
- * elements ([Section 2.64](#))
- * <xref> elements ([Section 2.67](#))

2.59.1. 'align' attribute

Controls whether the content of the cell appears left justified (default), centered, or right justified. Note that "center" or "right" probably only work well in cells with plain text; any other elements might make the contents render badly.

Allowed values:

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

2.59.2. 'border' attribute

The width of the border for this cell. The default is 0, meaning no border.

2.59.3. 'colspan' attribute

The number of columns that the cell to span. For example, setting "colspan='3'" indicates that the cell occupies the same horizontal space as three cells in the row above or below this one.

2.59.4. 'rowspan' attribute

The number of rows that the cell to span. For example, setting "rowspan='3'" indicates that the cell occupies the same vertical space as three rows.

2.60. <thead>

A container for a set of header rows for a table.

This element appears as a child element of: <table> ([Section 2.55](#)).

Content model:

One or more <tr> elements ([Section 2.62](#))

2.61. <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 is long (~40 characters), the "abbrev" attribute is used to specify an abbreviated variant.

This element appears as a child element of: <front> ([Section 2.27](#)).

Content model: only text content.

[2.61.1.](#) 'abbrev' attribute

Specifies an abbreviated variant of the document title.

[2.61.2.](#) 'ascii' attribute

The ASCII equivalent of the title.

[2.62.](#) <tr>

A row of a table.

This element appears as a child element of: <tbody> ([Section 2.56](#)), <tfoot> ([Section 2.58](#)), and <thead> ([Section 2.60](#)).

Content model:

One or more sequences of:

1. One <td> element
2. One <th> element

[2.62.1.](#) 'border' attribute

The width of the border for this row. The default is 0, meaning no border. If the cells in this row also have "border" attributes, those values override this value for those cells.

[2.63.](#) <tt>

Causes the text to be displayed in a constant-width font. This element can be combined with other character formatting elements, and the formatting will be additive.

This element appears as a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <blockquote> ([Section 2.11](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <name> ([Section 2.34](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), <refcontent> ([Section 2.41](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), and <th> ([Section 2.59](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <xref> elements ([Section 2.67](#))

**[2.64.](#) **

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

This element appears as a child element of: <aside> ([Section 2.6](#)), <section> ([Section 2.47](#)), <td> ([Section 2.57](#)), and <th> ([Section 2.59](#)).

Content model:

One or more elements ([Section 2.31](#))

[2.64.1.](#) '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"

[2.64.2.](#) '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"

[2.65.](#) <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 a child element of: <address> ([Section 2.2](#)).

Content model: only text content.

[2.66.](#) <workgroup>

This element is used to specify the Working Group (IETF) or Research Group (IRTF) from which the document originates, 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 2.46.11](#)).

This element appears as a child element of: <front> ([Section 2.27](#)).

Content model: only text content.

[2.67.](#) <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.

If the element is empty, a converter must invent text to show for the

reference. If the element is filled in and the format being converted to supports links, the text from the element is surrounded by a link to the reference.

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 a child element of: <annotation> ([Section 2.3](#)), ([Section 2.8](#)), <c> ([Section 3.1](#)), <cref> ([Section 2.17](#)), <dd> ([Section 2.19](#)), <dt> ([Section 2.22](#)), ([Section 2.23](#)), <i> ([Section 2.28](#)), ([Section 2.31](#)), <name> ([Section 2.34](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), ([Section 2.51](#)), <sub> ([Section 2.52](#)), <sup> ([Section 2.53](#)), <t> ([Section 2.54](#)), <td> ([Section 2.57](#)), <th> ([Section 2.59](#)), <tt> ([Section 2.63](#)), and <ttcol> ([Section 3.9](#)).

Content model: only text content.

2.67.1. 'format' attribute

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

"counter"

Inserts just a counter; this is used for the number of a section, figure, or table. For example:

```
<section anchor="overview">Protocol Overview</section>
. . .
See Section <xref target="overview" format="counter"/>
for an overview.
```

might generate

See [Section 1.7](#) for an overview.

"default"

Inserts a text fragment that describes the referenced part completely, such as "[Section 2](#)" or "Table 4" for internal links, or "[XML](#)" for links to references. For example:

```
<section anchor="overview">Protocol Overview</section>
```

```
. . .
```

```
See <xref target="overview"/> for an overview.
```

```
might generate
```

```
See Section 1.7 for an overview.
```

"none"

There will be no auto-generated text. This is useful for creating a link that will appear in the processed text.

"title"

Inserts a title for the referenced element (usually obtained from the referenced element's <name> child element. If the target is a reference, then the <title> element inside the <front> element is used.

Allowed values:

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

2.67.2. 'pageno' attribute

Deprecated.

Allowed values:

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

2.67.3. 'relative' attribute

Specifies a relative reference from the main target. Rendering relative references is based on the format for the converted document.

2.67.4. '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.

2.67.5. 'sectionFormat' attribute

The format that the section reference will be displayed in. The acceptable values are:

- o "of" (default)
- o "comma"
- o "parens"

For example:

See `<xref target="RFC6949" section="2.3" sectionFormat="of"/>`
for more information.

See `<xref target="RFC6949" section="2.4" sectionFormat="comma"/>`
for more information.

See `<xref target="RFC6949" section="2.5" sectionFormat="parens"/>`
for more information.

would generate

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

See [\[RFC6949\], Section 2.4](#) for more information.

See [\[RFC6949\] \(Section 2.5\)](#) for more information.

2.67.6. '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. Elements from v2 That Have Been Deprecated

This section lists the elements from v2 that have been deprecated. Note that some elements in v3 have attributes from v2 that are deprecated; those are not listed here.

3.1. <c>

Deprecated. Instead, use <tr>, <td>, and <th>.

This element appears as a child element of: <texttable> ([Section 3.8](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <spanx> elements ([Section 3.7](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

3.2. <facsimile>

Deprecated. The <email> element is a much more useful way to get in touch with authors.

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

Content model: only text content.

3.3. <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 a child element of: <reference> ([Section 2.42](#)).

Content model: this element does not have any contents.

3.3.1. 'octets' attribute

Deprecated.

3.3.2. 'target' attribute

Deprecated.

3.3.3. 'type' attribute (mandatory)

Deprecated.

3.4. <list>

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

This element appears as a child element of: <t> ([Section 2.54](#)).

Content model:

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

3.4.1. 'counter' attribute

Deprecated. The functionality of this attribute has been replaced with /@start.

3.4.2. 'hangIndent' attribute

Deprecated. Use <dl> instead.

3.4.3. 'style' attribute

Deprecated.

3.5. <postamble>

Deprecated. Instead, use a regular paragraph after the figure or table.

This element appears as a child element of: <figure> ([Section 2.26](#)), and <texttable> ([Section 3.8](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <spanx> elements ([Section 3.7](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

3.6. <preamble>

Deprecated. Instead, use a regular paragraph before the figure or table.

This element appears as a child element of: <figure> ([Section 2.26](#)), and <texttable> ([Section 3.8](#)).

Content model:

In any order:

- o Text
- o elements ([Section 2.8](#))
- o <bcp14> elements ([Section 2.10](#))
- o <cref> elements ([Section 2.17](#))
- o elements ([Section 2.23](#))
- o <eref> elements ([Section 2.25](#))
- o <i> elements ([Section 2.28](#))
- o <iref> elements ([Section 2.29](#))
- o <spanx> elements ([Section 3.7](#))
- o elements ([Section 2.51](#))
- o <sub> elements ([Section 2.52](#))
- o <sup> elements ([Section 2.53](#))
- o <tt> elements ([Section 2.63](#))
- o <xref> elements ([Section 2.67](#))

3.7. <spanx>

Deprecated.

This element appears as a child element of: <annotation> ([Section 2.3](#)), <c> ([Section 3.1](#)), <postamble> ([Section 3.5](#)), <preamble> ([Section 3.6](#)), and <t> ([Section 2.54](#)).

Content model: only text content.

3.7.1. 'style' attribute

Deprecated. Instead of <spanx style="emph">, use instead of <spanx style="strong">, use <i>; instead of <spanx style="verg">, use <tt>.

3.7.2. 'xml:space' attribute

Deprecated.

Allowed values:

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

3.8. <texttable>

Deprecated. Use <table> instead.

This element appears as a child element of: <aside> ([Section 2.6](#)), and <section> ([Section 2.47](#)).

Content model:

In this order:

1. One optional <name> element ([Section 2.34](#))
2. One optional <preamble> element ([Section 3.6](#))
3. One or more <ttable> elements ([Section 3.9](#))
4. Optional <c> elements ([Section 3.1](#))
5. One optional <postamble> element ([Section 3.5](#))

3.8.1. 'align' attribute

Deprecated

Allowed values:

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

3.8.2. 'anchor' attribute

Deprecated

[3.8.3.](#) 'style' attribute

Deprecated.

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

Deprecated.

Allowed values:

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

[3.8.5.](#) 'title' attribute

Deprecated.

[3.9.](#) <ttcol>

Deprecated. Instead, use <tr>, <td>, and <th>.

This element appears as a child element of: <texttable> ([Section 3.8](#)).

Content model:

In any order:

- o <cref> elements ([Section 2.17](#))
- o <eref> elements ([Section 2.25](#))
- o <iref> elements ([Section 2.29](#))
- o <xref> elements ([Section 2.67](#))
- o Text

[3.9.1.](#) 'align' attribute

Deprecated.

Allowed values:

- o "left" (default)

- o "center"
- o "right"

3.9.2. 'width' attribute

Deprecated.

3.10. <vspace>

Deprecated. In earlier versions of this format, <vspace> was often used to get an extra blank line in a list element; in the v3 vocabulary, that can be done instead by using multiple <t> elements inside the element. Other uses have no direct replacement.

This element appears as a child element of: <t> ([Section 2.54](#)).

Content model: this element does not have any contents.

3.10.1. 'blankLines' attribute

Deprecated.

4. Internationalization Considerations

This format is based on [[XML](#)], thus does not have any issues representing arbitrary Unicode [[UNICODE](#)] characters in text content. The RFC Editor may restrict some of the characters that can be used in a particular RFC; the rules for such restrictions are covered in [[NONASCII](#)].

5. Security Considerations

The "name" attribute on the <artwork> element ([Section 2.5.5](#)) 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.

The "type" attribute of the <artwork> and <sourcecode> elements is meant to encourage processors to automatically extract known types of content from an RFC or Internet Draft. While extraction is probably safe, those processors might also think that they could further process the extracted content such as by rendering artwork or executing code. Doing so without first sanity-checking the extracted content is clearly a terrible idea from a security perspective. More generally, a processor that is reading RFCs or Internet Drafts needs to be suspicious of any content that it intends to post-process.

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 updates the specification for the Internet media type "application/rfc+xml" from the one in [[XML2RFCv2](#)]. 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 [Section 9.1 of \[RFC7303\]](#).

Encoding considerations: Identical to those of "application/xml" as described in [Section 9.1 of \[RFC7303\]](#).

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 \[RFC7303\]](#).

Interoperability considerations: N/A

Published specification: This specification.

Applications that use this media type: Applications that transform xml2rfc to output representations 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 9.1 of \[RFC7303\]](#).

File extension(s): .xml or .rfcxml when disambiguation from other XML files is needed

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)

6.2. Link Relation Registration

The following is a proposed addition to [\[LINKRELATIONS\]](#).

Relation Name: convertedFrom

Description: The document linked to was later converted to the document that contains this link relation. For example, an RFC can have a link to the Internet Draft that became the RFC; in that case, the link relation would be "convertedFrom".

Reference: This document.

Notes: This relation is different than "predecessor-version" in that "predecessor-version" is for items in a version control system. It is also different than "previous" in that this relation is used for converted resources, not those that are part of a sequence of resources.

Application Data: none

7. Acknowledgments

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

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Appendix A. Front Page ('Boilerplate') Generation

A.1. The /rfc/@ipr Attribute

This attribute value can take a long list of values, each of which describes an IPR policy for the document ([Section 2.46.5](#)). The values are not the result of a grand design, but remain simply for historic reasons. Of these values, only a few are currently in use; all others are supported by 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>>.

For the current "Status Of This Memo" text, the submissionType attribute ([Section 2.46.11](#)) 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.1.1. Current Values: '*trust200902'

The name for these values refers to the "IETF TRUST Legal Provisions Relating to IETF Documents", sometimes simply called the "TLP", which 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.

Formatters 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.1.1.1. trust200902

This value should be used 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.1.1.2. 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.1.1.3. 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.1.1.4. pre5378Trust200902

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

This document may contain material from IETF Documents or IETF Contributions published or made publicly available before November 10, 2008. The person(s) controlling the copyright in some of this material may not have granted the IETF Trust the right to allow modifications of such material outside the IETF Standards Process. Without obtaining an adequate license from the person(s) controlling the copyright in such materials, this document may not be modified outside the IETF Standards Process, and derivative works of it may not be created outside the IETF Standards Process, except to format it for publication as an RFC or to translate it into languages other than English.

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.1.2. Historic Values

A.1.2.1. 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.

A.1.2.2. Historic Values: '*3978'

The attribute values "full3978", "noModification3978" and "noDerivatives3978" are similar to their counterparts above, except that they use text specified in [Section 5 of \[RFC3978\]](#).

A.1.2.3. Historic Values: '*3667'

The attribute values "full3667", "noModification3667" and "noDerivatives3667" are similar to their counterparts above, except that they use text specified in [Section 5 of \[RFC3667\]](#).

A.1.2.4. Historic Values: '*2026'

The attribute values "full2026" and "noDerivativeWorks2026" are similar to their counterparts above, except that they use text specified in [Section 10 of \[RFC2026\]](#).

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

A.2. The /rfc/@submissionType Attribute

The RFC Editor publishes documents from different "document streams", of which the "IETF stream" is the most prominent one. Other streams are the "independent stream" (used for things such as administrative information or April 1st RFCs), the "IAB stream" (Internet Architecture Board) and the "IRTF stream" (Internet Research Task Force).

The values for the attribute are "IETF" (the default value), "independent", "IAB", and "IRTF".

Historically, this attribute did not affect the final appearance of

RFCs, except for subtle differences in Copyright notices. Nowadays (as of [\[RFC5741\]](#)), the stream name appears in the first line of the front page, and it also affects the text in the "Status Of This Memo" section.

For current documents, setting `submissionType` attribute will have the following effect:

- o For RFCs, the stream name appears in the upper left corner of the first page (in Internet Drafts, this is either "Network Working Group", or the value of the `<workgroup>` element).
- o For RFCs, it affects the whole "Status Of This Memo" section (see [Section 3.2.2 of \[RFC5741\]](#)).
- o For all RFCs and Internet Drafts, it determines whether the "Copyright Notice" mentions the Copyright on Code Components (see TLP, Section "Text To Be Included in IETF Documents").

A.3. The `/rfc/@consensus` Attribute

For some of the publication streams (see [Appendix A.2](#)), the "Status Of This Memo" section depends on whether there was a consensus to publish (again, see [Section 3.2.2 of \[RFC5741\]](#)).

The consensus attribute ("yes"/"no", defaulting to "yes") can be used to supply this information. The effect for the various streams is:

- o "independent" and "IAB": none.
- o "IETF": mention that there was an IETF consensus.
- o "IRTF": mention that there was a research group consensus (where the name of the research group is extracted from the `<workgroup>` element).

Appendix B. The v3 Format and Processors

This section describes topics that are specific to processors. Note that there is some discussion of processors in the main body of the document as well. For example, some elements have descriptions of how a processor might create output from the element.

A processor has multiple roles. The processor checks whether or not the input is valid XML; it also checks whether or not the input XML matches this format. It may have one or more outputs, depending on the way that it is invoked. It might convert the XML to different XML, or to a different representation such as HTML or plain text, or

do no conversion at all. It also might give diagnostic warnings about how to improve the input.

In v2, the grammar was specified as a DTD. In v3, the grammar is specified only as Relax Next Generation (RNG). This means that processors need to work from the RNG, not from a DTD. Some of the features of the v3 grammar cannot be specified as a DTD.

This section differentiates between three types of processors:

- o RFC Processor -- The processor used by the RFC Editor to process the input from one of the RFC streams, and to process XML produced during the RFC editing process.
- o Draft Processor -- The processor used by the Internet Draft submission tool. This processor will be defined in a different document.
- o Private Processors -- There may be processors that are meant to run on the computers of authors. These processors may be used to produce interim versions of the non-canonical representations so that authors can see how their XML might later be rendered; to create documents in representations different than those supported by the RFC Editor; to possibly create documents that are not meant to be Internet Drafts or RFCs; and to convert XML that has external information into XML that has that external information included.

It is expected that a single piece of software will be used for both the RFC Processor and the Draft Processor, with different application settings to differentiate between them. It is also expected that the same software could be used as a Private Processor; others might create Private Processors independently, or using parts of, the software used by the RFC Editor.

The RFC Processor and Draft Processor must have clear error reporting, giving more context than just a line number. For example, the error messages will differentiate between errors in XML and those from the v3 format.

It is expected that both the RFC Processor and the Draft Processor will have options to produce different types of output. For example, they might have a "convert XML to XML" option that expands the XML entities in the output.

The restrictions on the canonical XML for RFCs, as well as how the non-canonical formats will look, are described at <https://www.rfc-editor.org/rse/wiki/>

doku.php?id=design:format-and-content-rfcs>.

B.1. Including External Text

All XML processors for v3 are expected to support XInclude [[XInclude](#)]. XInclude specifies a processing model and syntax for general purpose inclusion of information that is either on the Internet or local to the user's computer.

In the v3 syntax, XInclude is expressed as the <xi:include> element. To use this element, you need to include the "xi" namespace in the <rfc> element; that is, you need to specify

```
xmlns:xi="http://www.w3.org/2001/XInclude"
```

as one of the attributes in the <rfc> element.

The most common way to use <xi:include> is to pull in references that are already formed as XML. Currently, this can be done from xml2rfc.tools.ietf.org, but later is expected to be from the RFC Editor. For example, if a document has three normative references, all RFCs, the document might contain:

```
<references>
  <xi:include href="http://xml2rfc.tools.ietf.org/public/rfc/
    bibxml/reference.RFC.2119.xml"/>
  <xi:include href="http://xml2rfc.tools.ietf.org/public/rfc/
    bibxml/reference.RFC.4869.xml"/>
  <xi:include href="http://xml2rfc.tools.ietf.org/public/rfc/
    bibxml/reference.RFC.7169.xml"/>
</references>
```

<xi:include> can be used anywhere an XML element could be used (but not where free text is used). For example, if three Internet Drafts are all including a particular paragraph or section verbatim, that text can be kept either in a file or somewhere on the web, and be included with <xi:include>. An example of pulling something from the local disk would be:

```
<x:include href="file://home/chris/ietf/drafts/commontext.xml"/>
```

In general, XInclude should be used instead of ENTITY references and XML Processor Instructions (PIs) that allow external inclusions.

B.2. Anchors and IDs

People writing and reading Internet Drafts and RFCs often want to make reference to specific locations in those documents. In the case

of RFC authors, it is common to want to reference another part of their document, such as "see [Section 3.2](#) of this document". Readers, on the other hand, want to reference part of documents that they didn't write, such as "see [Section 3.2 of RFC 6949](#)". The XML vocabulary in this document attempts to support both sets of people.

Authors can leave anchors in a document that can later be used for references with the "anchor" attribute. Anchors can be included in the following elements: <artwork>, <aside>, <blockquote>, <cref>, <figure>, , <reference>, <referencegroup>, <section>, <sourcecode>, <t>, and <table>. The author can then refer to that anchor in the "target" attribute of the <xref> element.

Readers can refer to any element that has an "anchor" attribute by that attribute. Note, however, that most of the time, elements won't have anchors. In the common case, the reader wants to refer to an element that does not have an "anchor" attribute, but that element has "pn" attribute.

Processors add the "pn" attribute to many elements during processing. This attribute and its value are automatically generated by the processor if the attribute is not there; if the attribute is already there, the processor may replace the value.

B.2.1. Overlapping Values

In the HTML representation of this XML vocabulary, both anchors and "pn" attributes will be used in the "id" attributes of elements. Thus, there can be no overlap between the names entered in "anchor" attributes, in "slugifiedName" attributes, and those that are generated for the "pn" attributes. Also, there are some values for the "anchor" values that are reserved for sections, and those sections can only have those anchor values.

The following rules prevent this overlap:

- o "pn" for regular sections always has the format "s-nnn", where "nnn" is the section or appendix number. For example, this would be "s-2.1.3" for [Section 2.1.3](#) and "s-a" for [Appendix A](#). For the <abstract> element, it is always "s-abstract". For the <note> element, it is always "s-note-nnn", where "nnn" is a sequential value.
- o "pn" for <figure> elements always has the format "f-nnn", where "nnn" is the figure number. For example, this would be "f-5" for Figure 5.

- o "pn" for <table> elements always has the format "t-*nnn*", where "*nnn*" is the figure number. For example, this would be "t-5" for Table 5.
- o "pn" for all elements not listed above always has the format "p-*nnn*-*mmm*", where "*nnn*" is the section number and "*mmm*" is the relative position in the section. For example, this would be "p-2.1.3-7" for the seventh part number in [Section 2.1.3](#).
- o "slugifiedName" always has the format "n-*ttt*", where "*ttt*" is the text of the name after slugification. For example, this would be "n-protocol-overview" for the name "Protocol Overview". The actual conversions done in slugification will be specified at a later time.
- o Anchors must never overlap with any of the above. The easiest way to assure that is to not pick an anchor name that starts with a single letter followed by a hyphen. If an anchor does overlap with one of the types of names above, the processor will reject the document.

[Appendix C](#). Relax NG Schema

The following is the RelaxNG schema for the v3 format.

```
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 { text }?,
  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 }?,
  [ a:defaultValue = "no" ] attribute sortRefs { "yes" | "no" }?,
  [ a:defaultValue = "yes" ] attribute symRefs { "yes" | "no" }?,
  [ a:defaultValue = "yes" ]
  attribute tocInclude { "yes" | "no" }?,
  [ a:defaultValue = "3" ] attribute tocDepth { text }?,
  attribute finalizedTime { text }?,
  link*,
  front,
  middle,
  back?
}

link =
  element link {
    attribute href { text },
    attribute rel { text }?
  }

front =
  element front {
    title,
    author+,
    date?,
    area*,
    workgroup*,
    keyword*,
    abstract?,
    seriesInfo*,
    note*,
    boilerplate?
  }

title =
  element title {

```

```
    attribute abbrev { text }?,
    attribute ascii { text }?,
    text
  }

author =
  element author {
    attribute initials { text }?,
    attribute asciiInitials { text }?,
    attribute surname { text }?,
    attribute asciiSurname { text }?,
    attribute fullname { text }?,
    attribute role { "editor" }?,
    [ a:defaultValue = "en" ] attribute xml:lang { text }?,
    attribute asciiFullname { text }?,
    organization?,
    address?
  }

organization =
  element organization {
    attribute abbrev { text }?,
    attribute ascii { text }?,
    text,
    [ a:defaultValue = "en" ] attribute xml:lang { text }?
  }

address =
  element address { postal?, phone?, facsimile?, email?, uri? }

postal =
  element postal {
    [ a:defaultValue = "en" ] attribute xml:lang { text }?,
    ((city | code | country | region | street)* | postalLine+)
  }

street =
  element street {
    attribute ascii { text }?,
    text
  }

city =
  element city {
    attribute ascii { text }?,
    text
  }
```

```
region =
  element region {
    attribute ascii { text }?,
    text
  }

code =
  element code {
    attribute ascii { text }?,
    text
  }

country = element country { text }

postalLine =
  element postalLine {
    attribute ascii { text }?,
    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 {
```

```
    attribute pn { text }?,
    t+
  }

note =
  element note {
    attribute title { text }?,
    name,
    attribute pn { text }?,
    [ a:defaultValue = "no" ]
    attribute removeInRFC { "yes" | "no" }?,
    t+
  }

boilerplate = element boilerplate { section+ }

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" }?,
    attribute pn { text }?,
    name?,
    (artwork
     | aside
     | blockquote
     | dl
     | figure
     | iref
     | ol
     | sourcecode
     | t
     | table
     | texttable
     | ul)*,
    section*
  }

name =
  element name {
    attribute slugifiedName { text }?,
    (text | cref | eref | tt | xref)*
  }
```

```
    }
t =
  element t {
    attribute anchor { xsd:ID }?,
    attribute hangText { text }?,
    attribute pn { text }?,
    ([ a:defaultValue = "false" ] attribute keepwithnext { text },
     ("false" | "true"))?,
    ([ a:defaultValue = "false" ]
     attribute keepwithprevious { text },
     ("false" | "true"))?,
    (text
     | b
     | bcp14
     | cref
     | em
     | eref
     | i
     | iref
     | \list
     | ol
     | spanx
     | strong
     | sub
     | sup
     | tt
     | vspace
     | xref)*
  }

aside =
  element aside {
    attribute anchor { xsd:ID }?,
    attribute pn { text }?,
    (artwork | dl | figure | iref | \list | ol | t | table | ul)*
  }

blockquote =
  element blockquote {
    attribute anchor { xsd:ID }?,
    attribute pn { text }?,
    attribute cite { text }?,
    attribute quotedFrom { text }?,
    (text
     | artwork
     | b
     | bcp14
```

```
    | em
    | figure
    | i
    | sourcecode
    | strong
    | sub
    | sup
    | t
    | tt)*
  }

\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 }?,
    attribute group { 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 {
    attribute anchor { xsd:ID }?,
    attribute pn { text }?,
    (t+
    | (text
      | b
      | bcp14
      | cref
      | em
```



```
    | eref
    | i
    | iref
    | strong
    | sub
    | sup
    | tt
    | xref)+)
}

dl =
element dl {
  [ a:defaultValue = "normal" ]
  attribute spacing { "normal" | "compact" }?,
  [ a:defaultValue = "true" ]
  attribute hanging { "false" | "true" }?,
  (dt, dd)+
}

dt =
element dt {
  attribute anchor { xsd:ID }?,
  attribute pn { text }?,
  (text
  | b
  | bcp14
  | cref
  | em
  | eref
  | i
  | iref
  | strong
  | sub
  | sup
  | tt
  | xref)*
}

dd =
element dd {
  t+
  | (text
  | b
  | bcp14
  | cref
  | em
  | eref
  | i
```

```

    | iref
    | strong
    | sub
    | sup
    | tt
    | xref)+
}

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 },
  attribute relative { text }?,
  attribute sectionFormat { 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 }?,
  [ a:defaultValue = "true" ]
  attribute display { "true" | "false" }?,
  (text | b | em | eref | i | strong | sub | sup | tt | xref)*
}

tt =
element tt {
  (text

```

```
    | b
    | bcp14
    | cref
    | em
    | eref
    | i
    | iref
    | strong
    | sub
    | sup
    | xref)*
  }

b =
  element b {
    (text
      | bcp14
      | cref
      | em
      | eref
      | i
      | iref
      | sub
      | sup
      | tt
      | xref)*
    )
  }

strong =
  element strong {
    (text
      | bcp14
      | cref
      | em
      | eref
      | i
      | iref
      | sub
      | sup
      | tt
      | xref)*
    )
  }

i =
  element i {
    (text
      | b
      | bcp14

```

```
    | cref
    | eref
    | iref
    | strong
    | sub
    | sup
    | tt
    | xref)*
}

em =
element em {
  (text
  | b
  | bcp14
  | cref
  | eref
  | iref
  | strong
  | sub
  | sup
  | tt
  | xref)*
}

sub =
element sub {
  (text
  | b
  | bcp14
  | cref
  | em
  | eref
  | i
  | iref
  | strong
  | tt
  | xref)*
}

sup =
element sup {
  (text
  | b
  | bcp14
  | cref
  | em
  | eref
```

```
    | i
    | iref
    | strong
    | tt
    | xref)*
}

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 }?,
  attribute pn { text }?,
  name?,
  iref*,
  preamble?,
  (artwork | sourcecode)+,
  postamble?
}

table =
element table {
  attribute anchor { xsd:ID }?,
  attribute pn { text }?,
  name?,
  iref*,
  thead?,
```

```
tbody+,
tfoot?
}

preamble =
  element preamble {
    (text
     | b
     | bcp14
     | cref
     | em
     | eref
     | i
     | iref
     | spanx
     | strong
     | sub
     | sup
     | tt
     | xref)*
  }

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 }?,
    attribute anchor { xsd:ID }?,
    attribute pn { text }?,
    text*
  }

sourcecode =
  element sourcecode {
    [ a:defaultValue = "" ] attribute name { text }?,
    [ a:defaultValue = "" ] attribute type { text }?,
    attribute src { text }?,
    attribute anchor { xsd:ID }?,
    attribute pn { text }?,
    text
  }
```

```
thead = element thead { tr+ }

tbody = element tbody { tr+ }

tfoot = element tfoot { tr+ }

tr =
  element tr {
    [ a:defaultValue = "0" ] attribute border { text }?,
    (td, th)+
  }

td =
  element td {
    [ a:defaultValue = "0" ] attribute border { text }?,
    [ a:defaultValue = "0" ] attribute colspan { text }?,
    [ a:defaultValue = "0" ] attribute rowspan { text }?,
    [ a:defaultValue = "left" ]
    attribute align { "left" | "center" | "right" }?,
    (t+
     | (text
        | artwork
        | b
        | bcp14
        | br
        | cref
        | dl
        | em
        | eref
        | figure
        | i
        | iref
        | ol
        | sourcecode
        | strong
        | sub
        | sup
        | tt
        | ul
        | xref)+
    )
  }

th =
  element th {
    [ a:defaultValue = "0" ] attribute border { text }?,
    [ a:defaultValue = "0" ] attribute colspan { text }?,
    [ a:defaultValue = "0" ] attribute rowspan { text }?,
    [ a:defaultValue = "left" ]
```

```
attribute align { "left" | "center" | "right" }?,
(t+
 | (text
   | artwork
   | b
   | bcp14
   | br
   | cref
   | dl
   | em
   | eref
   | figure
   | i
   | iref
   | ol
   | sourcecode
   | strong
   | sub
   | sup
   | tt
   | ul
   | xref)+)
}

postamble =
element postamble {
  (text
   | b
   | bcp14
   | cref
   | em
   | eref
   | i
   | iref
   | spanx
   | strong
   | sub
   | sup
   | tt
   | xref)*
}

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" }?,
name?,
preamble?,
ttcol+,
c*,
postamble?
}

ttcol =
  element ttcol {
    attribute width { text }?,
    [ a:defaultValue = "left" ]
    attribute align { "left" | "center" | "right" }?,
    (cref | eref | iref | xref | text)*
  }

c =
  element c {
    (text
     | b
     | bcp14
     | cref
     | em
     | eref
     | i
     | iref
     | spanx
     | strong
     | sub
     | sup
     | tt
     | xref)*
  }

bcp14 = element bcp14 { text }

br = element br { empty }

back = element back { displayreference*, references*, section* }

displayreference =
  element displayreference {
    attribute target { xsd:IDREF },
    attribute to { text }
  }
```

```
references =
  element references {
    attribute anchor { xsd:ID },
    name,
    (reference | referencegroup)*
  }

reference =
  element reference {
    attribute anchor { xsd:ID },
    attribute target { text }?,
    front,
    (annotation | format | refcontent | seriesInfo)*
  }

referencegroup =
  element referencegroup {
    attribute anchor { xsd:ID },
    reference+
  }

seriesInfo =
  element seriesInfo {
    attribute name { text },
    attribute value { text },
    attribute asciiname { text }?,
    attribute asciivalue { text }?,
    empty
  }

format =
  element format {
    attribute target { text }?,
    attribute type { text },
    attribute octets { text }?,
    empty
  }

annotation =
  element annotation {
    attribute ascii { text }?,
    (text
     | b
     | bcp14
     | cref
     | em
     | eref
     | i
```

```

    | iref
    | spanx
    | strong
    | sub
    | sup
    | tt
    | xref)*
}

refcontent =
  element refcontent {
    attribute ascii { text }?,
    (text | b | bcp14 | em | i | strong | sub | sup | tt)*
  }

start = rfc

```

[Appendix D](#). Schema Differences from v2

The following is a non-normative comparison of the v3 format to the v2 format. A "-" indicates lines removed from the v2 schema, and a "+" indicates lines added to the v3 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 category { text }?,
    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 }?,
+ [ a:defaultValue = "no" ] attribute sortRefs { "yes" | "no"
+ }?,
+ [ a:defaultValue = "yes" ] attribute symRefs { "yes" | "no"
+ }?,
+ [ a:defaultValue = "yes" ]
+ attribute tocInclude { "yes" | "no" }?,
+ [ a:defaultValue = "3" ] attribute tocDepth { text }?,
+ attribute finalizedTime { text }?,
+ link*,
+ front,
+ middle,
+ back?
}
+ link =
+ element link {
+   attribute href { text },
+   attribute rel { text }?
+ }
front =
  element front {
-   title, author+, date, area*, workgroup*, keyword*, abstract?,
- note*
+   title,
+   author+,
+   date?,
+   area*,
+   workgroup*,
+   keyword*,
+   abstract?,
+   seriesInfo*,
+   note*,
+   boilerplate?
  }

```

```
title =
  element title {
    attribute abbrev { text }?,
+   attribute ascii { text }?,
    text
  }
author =
  element author {
    attribute initials { text }?,
+   attribute asciiInitials { text }?,
    attribute surname { text }?,
+   attribute asciiSurname { text }?,
    attribute fullname { text }?,
    attribute role { "editor" }?,
+   [ a:defaultValue = "en" ] attribute xml:lang { text }?,
+   attribute asciiFullname { text }?,
    organization?,
    address?
  }
organization =
  element organization {
    attribute abbrev { text }?,
+   attribute ascii { text }?,
    text,
+   [ a:defaultValue = "en" ] attribute xml:lang { text }?
  }
+ address =
+   element address { postal?, phone?, facsimile?, email?, uri? }
+ postal =
+   element postal {
+     [ a:defaultValue = "en" ] attribute xml:lang { text }?,
+     ((city | code | country | region | street)* | postalLine+)
+   }
+ street =
+   element street {
+     attribute ascii { text }?,
+     text
+   }
+ city =
+   element city {
+     attribute ascii { text }?,
+     text
+   }
+ region =
+   element region {
+     attribute ascii { text }?,
+     text
+   }
```

```
+ code =
+   element code {
+     attribute ascii { text }?,
+     text
+   }
- address = element address { postal?, phone?, facsimile?, email?,
- uri? }
- postal = element postal { street+, (city | region | code |
- country)* }
- street = element street { text }
- city = element city { text }
- region = element region { text }
- code = element code { text }
  country = element country { text }
+ postalLine =
+   element postalLine {
+     attribute ascii { text }?,
+     text
+   }
  phone = element phone { text }
  facsimile = element facsimile { text }
- email = element email { 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+ }
+ abstract =
+   element abstract {
+     attribute pn { text }?,
+     t+
+   }
  note =
    element note {
-     attribute title { text },
+     attribute title { text }?,
```

```

+   name,
+   attribute pn { text }?,
+   [ a:defaultValue = "no" ]
+   attribute removeInRFC { "yes" | "no" }?,
+   t+
  }
+ boilerplate = element boilerplate { section+ }
  middle = element middle { section+ }
  section =
    element section {
      attribute anchor { xsd:ID }?,
-     attribute title { text },
+     attribute title { text }?,
+     [ a:defaultValue = "yes" ] attribute numbered { "yes" | "no"
+ }?,
      [ a:defaultValue = "default" ]
      attribute toc { "include" | "exclude" | "default" }?,
-     (t | figure | texttable | iref)*,
+     [ a:defaultValue = "no" ]
+     attribute removeInRFC { "yes" | "no" }?,
+     attribute pn { text }?,
+     name?,
+     (artwork
+     | aside
+     | blockquote
+     | dl
+     | figure
+     | iref
+     | ol
+     | sourcecode
+     | t
+     | table
+     | texttable
+     | ul)*,
      section*
    }
+ name =
+   element name {
+     attribute slugifiedName { text }?,
+     (text | cref | eref | tt | xref)*
+   }
  t =
    element t {
      attribute anchor { xsd:ID }?,
      attribute hangText { text }?,
+     attribute pn { text }?,
+     ([ a:defaultValue = "false" ] attribute keepwithnext { text },
+     ("false" | "true"))?,

```

```

+   ([ a:defaultValue = "false" ]
+   attribute keepwithprevious { text },
+   ("false" | "true"))?,
+   (text
-   | \list
-   | figure
-   | xref
+   | b
+   | bcp14
+   | cref
+   | em
+   | eref
+   | i
+   | iref
-   | cref
+   | \list
+   | ol
+   | spanx
-   | vspace)*
+   | strong
+   | sub
+   | sup
+   | tt
+   | vspace
+   | xref)*
+   }
+   aside =
+   element aside {
+   attribute anchor { xsd:ID }?,
+   attribute pn { text }?,
+   (artwork | dl | figure | iref | \list | ol | t | table | ul)*
+   }
+   blockquote =
+   element blockquote {
+   attribute anchor { xsd:ID }?,
+   attribute pn { text }?,
+   attribute cite { text }?,
+   attribute quotedFrom { text }?,
+   (text
+   | artwork
+   | b
+   | bcp14
+   | em
+   | figure
+   | i
+   | sourcecode
+   | strong
+   | sub

```



```

+     | sup
+     | t
+     | tt)*
+   }
+ \list =
+   element list {
-     attribute style { text }?,
+     [ 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 }?,
+     attribute group { 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 {
+     attribute anchor { xsd:ID }?,
+     attribute pn { text }?,
+     (t+
+     | (text
+     | b
+     | bcp14
+     | cref
+     | em
+     |eref
+     | i
+     | iref
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)+)
+   }

```

```

+ dl =
+   element dl {
+     [ a:defaultValue = "normal" ]
+     attribute spacing { "normal" | "compact" }?,
+     [ a:defaultValue = "true" ]
+     attribute hanging { "false" | "true" }?,
+     (dt, dd)+
+   }
+ dt =
+   element dt {
+     attribute anchor { xsd:ID }?,
+     attribute pn { text }?,
+     (text
+     | b
+     | bcp14
+     | cref
+     | em
+     |eref
+     | i
+     | iref
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ dd =
+   element dd {
+     t+
+     | (text
+     | b
+     | bcp14
+     | cref
+     | em
+     |eref
+     | i
+     | iref
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)+
+   }
+ xref =
+   element xref {
+     attribute target { xsd:IDREF },
+     [ a:defaultValue = "false" ] attribute pageno { "true" |
- "false" }?,

```

```

+   [ a:defaultValue = "false" ]
+   attribute pageno { "true" | "false" }?,
+   [ a:defaultValue = "default" ]
+   attribute format { "counter" | "title" | "none" | "default"
+   }?,
+   (attribute section { text },
+   attribute relative { text }?,
+   attribute sectionFormat { 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
+   [ a:defaultValue = "true" ]
+   attribute display { "true" | "false" }?,
+   (text | b | em | eref | i | strong | sub | sup | tt | xref)*
+   }
+   tt =
+   element tt {
+   (text
+   | b
+   | bcp14
+   | cref
+   | em
+   | eref
+   | i
+   | iref
+   | strong
+   | sub
+   | sup
+   | xref)*
+   }
+   b =

```

```
+ element b {
+   (text
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ strong =
+ element strong {
+   (text
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ i =
+ element i {
+   (text
+     | b
+     | bcp14
+     | cref
+     | eref
+     | iref
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ em =
+ element em {
+   (text
+     | b
+     | bcp14
+     | cref
+     | eref
```

```

+     | iref
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ sub =
+   element sub {
+     (text
+     | b
+     | bcp14
+     | cref
+     | em
+     |eref
+     | i
+     | iref
+     | strong
+     | tt
+     | xref)*
+   }
+ sup =
+   element sup {
+     (text
+     | b
+     | bcp14
+     | cref
+     | em
+     |eref
+     | i
+     | iref
+     | strong
+     | tt
+     | xref)*
+   }
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 }?,
+     attribute pn { text }?,
+     name?,
+     iref*,
+     preamble?,
-     artwork,
+     (artwork | sourcecode)+,
+     postamble?
    }
+ table =
+   element table {
+     attribute anchor { xsd:ID }?,
+     attribute pn { text }?,
+     name?,
+     iref*,
+     thead?,
+     tbody+,
+     tfoot?
+   }
+ preamble =
-   element preamble { (text | xref | eref | iref | cref | spanx)* }
+   element preamble {
+     (text
+     | b
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref
+     | spanx
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ artwork =

```

```

    element artwork {
-     [ a:defaultValue = "preserve" ]
-     attribute xml:space { "default" | "preserve" }?,
+     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 }?,
+     attribute anchor { xsd:ID }?,
+     attribute pn { text }?,
        text*
    }
+ sourcecode =
+   element sourcecode {
+     [ a:defaultValue = "" ] attribute name { text }?,
+     [ a:defaultValue = "" ] attribute type { text }?,
+     attribute src { text }?,
+     attribute anchor { xsd:ID }?,
+     attribute pn { text }?,
+     text
+   }
+ thead = element thead { tr+ }
+ tbody = element tbody { tr+ }
+ tfoot = element tfoot { tr+ }
+ tr =
+   element tr {
+     [ a:defaultValue = "0" ] attribute border { text }?,
+     (td, th)+
+   }
+ td =
+   element td {
+     [ a:defaultValue = "0" ] attribute border { text }?,
+     [ a:defaultValue = "0" ] attribute colspan { text }?,
+     [ a:defaultValue = "0" ] attribute rowspan { text }?,
+     [ a:defaultValue = "left" ]
+     attribute align { "left" | "center" | "right" }?,
+     (t+
+     | (text
+     | artwork
+     | b
+     | bcp14
+     | br
+     | cref

```

```

+         | dl
+         | em
+         | eref
+         | figure
+         | i
+         | iref
+         | ol
+         | sourcecode
+         | strong
+         | sub
+         | sup
+         | tt
+         | ul
+         | xref)+)
+     }
+ th =
+   element th {
+     [ a:defaultValue = "0" ] attribute border { text }?,
+     [ a:defaultValue = "0" ] attribute colspan { text }?,
+     [ a:defaultValue = "0" ] attribute rowspan { text }?,
+     [ a:defaultValue = "left" ]
+     attribute align { "left" | "center" | "right" }?,
+     (t+
+       | (text
+         | artwork
+         | b
+         | bcp14
+         | br
+         | cref
+         | dl
+         | em
+         | eref
+         | figure
+         | i
+         | iref
+         | ol
+         | sourcecode
+         | strong
+         | sub
+         | sup
+         | tt
+         | ul
+         | xref)+)
+     )
+   }
+   postamble =
-   element postamble { (text | xref | eref | iref | cref | spanx)*
+   element postamble {
+     (text

```



```

+     | b
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref
+     | spanx
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
}
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" }?,
+   name?,
    preamble?,
    ttcoll+,
    c*,
    postamble?
  }
ttcoll =
  element ttcoll {
    attribute width { text }?,
    [ a:defaultValue = "left" ]
    attribute align { "left" | "center" | "right" }?,
-   text
+   (cref | eref | iref | xref | text)*
+ }
+ c =
+ element c {
+   (text
+     | b
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref

```

```

+     | spanx
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ bcp14 = element bcp14 { text }
+ br = element br { empty }
+ back = element back { displayreference*, references*, section* }
+ displayreference =
+   element displayreference {
+     attribute target { xsd:IDREF },
+     attribute to { text }
+   }
- c = element c { (text | xref | eref | iref | cref | spanx)* }
- back = element back { references*, section* }
references =
  element references {
-   [ a:defaultValue = "References" ] attribute title { text }?,
-   reference+
+   attribute anchor { xsd:ID },
+   name,
+   (reference | referencegroup)*
  }
reference =
  element reference {
    attribute anchor { xsd:ID },
    attribute target { text }?,
    front,
-   seriesInfo*,
-   format*,
-   annotation*
+   (annotation | format | refcontent | seriesInfo)*
+   }
+ referencegroup =
+   element referencegroup {
+     attribute anchor { xsd:ID },
+     reference+
+   }
seriesInfo =
  element seriesInfo {
    attribute name { text },
    attribute value { text },
+   attribute asciiname { text }?,
+   attribute asciivalue { text }?,
    empty
  }

```

```

format =
  element format {
    attribute target { text }?,
    attribute type { text },
    attribute octets { text }?,
    empty
  }
annotation =
- element annotation { (text | xref | eref | iref | cref |
- spanx)* }
+ element annotation {
+   attribute ascii { text }?,
+   (text
+     | b
+     | bcp14
+     | cref
+     | em
+     | eref
+     | i
+     | iref
+     | spanx
+     | strong
+     | sub
+     | sup
+     | tt
+     | xref)*
+   }
+ refcontent =
+ element refcontent {
+   attribute ascii { text }?,
+   (text | b | bcp14 | em | i | strong | sub | sup | tt)*
+   }
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```

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