

# The DocBook Schema

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Norman Walsh, Sun Microsystems, Inc. <Norman.Walsh@Sun.COM> Copyright © OASIS® 2008. All Rights Reserved.

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#### Abstract:

DocBook is a general purpose [xml-rec] schema particularly well suited to books and papers about computer hardware and software (though it is by no means limited to these applications).

The Version 5.0 release is a complete rewrite of DocBook in RELAX NG. The intent of this rewrite is to produce a schema that is true to the spirit of DocBook while simultaneously removing inconsistencies that have arisen as a natural consequence of DocBook's long, slow evolution. The Technical Committee has taken this opportunity to simplify a number of content models and tighten constraints where RELAX NG makes that possible.

The Technical Committee provides the DocBook 5.0 schema in other schema languages, including W3C XML Schema and an XML DTD, but the RELAX NG Schema is now the normative schema.

#### Status:

This Committee Draft was [FIXME: URI] approved for publication by the OASIS DocBook Technical Committee. It represents the consensus of the committee.

Please send comments on this specification to the <docbook@lists.oasis-open.org> list. To subscribe, please use the OASIS Subscription Manager.

The errata page for this specification is at http://www.oasis-open.org/docbook/specs/docbook5-errata.html.

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#### **Table of Contents**

1. Introduction	3
1.1. Terminology	_
1.2. Normative References	
1.3. Non-Normative References	. 4
2. The DocBook RELAX NG Schema	
2.1. Removing Legacy Elements	
2.2. Smaller Content Models	
2.3. Uniform Info Elements	. 6
2.4. Required Titles	. (
2.5. Required Version	

2.6. Co-Constraints	7
2.7. Improved HTML and CALS Table Support	7
2.8. Data Types	7
2.9. Universal Linking	
2.10. Improved Accessibility	
2.11. Simplified Table of Contents Markup	8
2.12. Extra-Grammatical Constraints	8
2.13. Customization	8
2.14. Conversion	9
3. Release Notes	9
Appendixes	
A. The DocBook Media Type	9
1. Registration of MIME media type application/docbook+xml	9
2. Fragment Identifiers	10
B. Acknowledgements (Non-Normative)	10
C. Revision History	11
1. Changes in DocBook V5.0	11
2. Changes in DocBook V5.0CR7	11
3. Changes in DocBook V5.0CR6	11
4. Changes in DocBook V5.0CR5	11
5. Changes in DocBook V5.0CR4	11
6. Changes in DocBook V5.0CR3	12
7. Changes in DocBook V5.0CR2	12
8. Changes in DocBook V5.0CR1	12
9. Changes in DocBook V5.0b9	12
10. Changes in DocBook V5.0b8	13
11. Changes in DocBook V5.0b7	13
12. Changes in DocBook V5.0b6	
13. Changes in DocBook V5.0b5	13
14. Changes in DocBook V5.0b4	14
15. Changes in DocBook V5.0b3	14
16. Changes in DocBook V5.0b2	15

# 1. Introduction

DocBook is general purpose XML schema particularly well suited to books and papers about computer hardware and software (though it is by no means limited to these applications).

The DocBook Technical Committee maintains the DocBook schema. Starting with V5.0, DocBook is normatively available as a [relaxng] Schema (with some additional Schematron assertions). W3C XML Schema and Document Type Definition (DTD) versions are also available.

The Version 5.0 release is a complete rewrite. In programming-language terms, think of it as a code refactoring.

This rewrite introduces a large number of backwards-incompatible changes. Essentially all DocBook V4.x documents will have to be modified to validate against DocBook V5.0. An XSLT 1.0 stylesheet is provided to ease this transition.

The DocBook Technical Committee welcomes bug reports and requests for enhancement (RFEs) from the user community. The current list of outstanding requests is available through the SourceForge tracker interface. This is also the preferred mechanism for submitting new requests. Old RFEs, from a previous legacy tracking system, are archived for reference.

# 1.1. Terminology

The key words *must*, *must* not, *required*, *shall*, *shall* not, *should*, *should* not, *recommended*, *may*, and *optional* in this Committee Draft are to be interpreted as described in [rfc2119]. Note that for reasons of style, these words are not capitalized in this document.

### 1.2. Normative References

Error: no bibliography entry: relaxng found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: xml-rec found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: xlink11 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: rfc2119 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: rfc3023 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: bib.docbooktdg5 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

#### 1.3. Non-Normative References

Error: no bibliography entry: iso8879 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: xmlschema-1 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: xmlschema-2 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

Error: no bibliography entry: schematron2000 found in http://docbook.sourceforge.net/release/bibliography/bibliography.xml

## 2. The DocBook RELAX NG Schema

The DocBook RELAX NG Schema is distributed from the DocBook site at OASIS. DocBook is also available from the mirror on http://docbook.org/.

In V5.0, DocBook has been rewritten as a native RELAX NG grammar. The goals of this redesign were to produce a schema that:

- 1. "feels like" DocBook. Most existing documents should still be valid or it should be possible to transform them in simple, mechanical ways into valid documents.
- 2. enforces as many constraints as possible in the schema. Some additional constraints are expressed with Schematron rules.
- 3. cleans up the content models.
- 4. gives users the flexibility to extend or subset the schema in an easy and straightforward way.
- 5. can be used to generate XML DTD and W3C XML Schema versions of DocBook.

Under the ordinary operating rules of DocBook evolution, the only backwards incompatible changes that could be made in DocBook V5.0 were those announced in DocBook V4.0. In light of the fact that this is a complete rewrite, the Technical Committee gave itself the freedom to make "unannounced" backwards-incompatible changes for this one release.

# 2.1. Removing Legacy Elements

A number of elements have been removed from DocBook. Many of these have been replaced by simpler, more versatile alternatives. Others have simply been removed because they are not believed to be widely used:

#### **DocBook Element Changes**

 $\verb|article| info, bookinfoinfo|. Replaced by info, see Section 2.3, "Uniform Info Elements".$ 

..., \*info

authorblurb Replaced by personblurb. This more general name better reflects the fact

that it is available in elements other than author (e.g., editor).

collabname, corpauthor, corporedit corpname

Replaced by orgname and the updated content models of author, editor,

and othercredit.

graphic, graphicco, inlinegraphic mediaobjectco Removed in favor of mediaobject and inlinemediaobject.

isbn, issn, pubsnumber Replaced by biblioid.

lot, lotentry, tocback, tocchap, tocfront, toclevel1, toclevel2, toclevel3, toclevel4, toclevel5, tocpart Replaced by simpler tocdiv element.

ulink Replaced by ubiquitous linking, see Section 2.9, "Universal Linking".

sgmltag Replaced by tag.

action, beginpage, highlights, interface, invpartnumber, medialabel, modespec, structfield, structname Removed.

#### 2.2. Smaller Content Models

The content models of many inlines have been reduced, sometimes drastically. The parameter entity customization of DocBook V4.x and previous versions resulted in very broad content models for some inlines.

Consider, for example, command in DocBook V4.4:

```
command ::=
```

(#PCDATA|link|olink|ulink|action|application|classname|methodname|interfacename|exceptionname|ooclass|oointerface|ooexception|command|computeroutput|database|email|envar|errorcode|errorname|errortype|errortext|filename|function|guibutton|guiicon|guilabel|guimenu|guimenuitem|guisubmenu|hardware|interface|keycap|keycode|

keycombo|keysym|literal|code|constant|markup|medialabel|
menuchoice|mousebutton|option|optional|parameter|prompt|property|
replaceable|returnvalue|sgmltag|structfield|structname|symbol|
systemitem|uri|token|type|userinput|varname|nonterminal|anchor|
remark|subscript|superscript|inlinegraphic|inlinemediaobject|
indexterm|beginpage)\*

In DocBook V5.0, command has a much smaller, more rational content model:

command ::=

- \* Zero or more of:
  - o text
  - o alt
  - o anchor
  - o annotation
  - o biblioref
  - o indexterm
  - o inlinemediaobject
  - o link
  - o phrase
  - o remark
  - o replaceable
  - o subscript
  - o superscript
  - o xref

DocBook V5.0 may be overzealous in its simplification of content models. The Technical Committee expects to adjust these simplifications during user testing. Users are encouraged to report places where formally valid documents can no longer be made valid because content models have been reduced.

## 2.3. Uniform Info Elements

DocBook V4.x has setinfo, bookinfo, chapterinfo, appendixinfo, sectioninfo, etc. DocBook would be smaller and simpler if it had a single info element in all these places.

There's an historical reason for the large number of unique names: customizers might very well want to adjust the content models of info elements at different levels. For example, a copyright statement might be required at the book level, or an author forbidden at the sub-section level. In DTDs, there's only one content model allowed per element name, so in order to support independent customization, each info element must have a different name.

In RELAX NG, no such limitation exists. We can use patterns to achieve both a single info element while still allowing customizers to change its content model in different contexts. In light of this functionality, we've replaced all the various flavors of info with a single element name.

# 2.4. Required Titles

DocBook V5.0 enforces the constraint that titles are required on articles and other large structures where they are effectively optional in DocBook V4.x. (They are optional only in the sense that DTDs are unable to enforce the constraint that they be present, the documentation has always made it clear that titles were required.)

# 2.5. Required Version

In DocBook V4.x and earlier, the presence of a document type declaration served as a mechanism for identifying the DocBook version of a document. Although the declaration was not actually required, it was present in the vast majority of DocBook documents.

In RELAX NG, no similar declaration exists. Although a document type declaration might still be present, it seems likely that this will not usually be the case.

Nevertheless, downstream processors may benefit from some indication of the version of DocBook being used. As a result DocBook V5.0 adds a new version attribute which *must* be present on the document element of a DocBook document.

Mixing versions is explicitly allowed and the version attribute may be used on other elements as well. This might be the case, for example, in a compound document constructed from multiple documents each with its own version.

#### 2.6. Co-Constraints

DocBook V5.0 enforces attribute co-constraints such as the class/otherclass attributes on biblioid.

# 2.7. Improved HTML and CALS Table Support

In DocBook V5.0, HTML tables and CALS tables are independently specified. Where the DTD of DocBook V4.x allows for incoherent mixing of the two models, DocBook V5.0 forbids such mixtures.

# 2.8. Data Types

DocBook V5.0 adds a few simple data types. For example, the cols attribute on tgroup must be a positive integer.

Some of these constraints, such as the requirement that elements like pubdate include a proper date-time type, may prove controversial. Users are encouraged to report places where formally valid documents can no longer be made valid because data types have been introduced.

## 2.9. Universal Linking

Starting with DocBook V5.0, the linkend and xlink: href attributes are available on almost all elements.

The linkend attribute provides an ID/IDREF link within the document. The xlink: href attribute provides a URI-based link.

The ulink element has been removed from DocBook as URI-based links can now be achieved directly from the appropriate inline (such as productname or command). For instances where no specific semantic inline is needed, link is still available. Where link used to be limited to ID/IDREF linking, it now sports an xlink: href attribute as well.

Support for extended links are provided through the extendedlink, arc, and locator elements.

# 2.10. Improved Accessibility

Accessibility is improved by allowing both inline and block annotations in most context. The alt element is now allowed in most places for inline annotations, the new element annotation supports block annotations.

# 2.11. Simplified Table of Contents Markup

The DocBook V4.x markup for Tables of Contents, or more generally for Lists of Titles, was complex and had not evolved quite in step with the rest of DocBook. In DocBook V5.0, it has all been replaced by a quite simple, recursive toc/tocdiv/tocentry structure.

While most Tables of Contents and Lists of Titles are generated automatically and authors never have to produce markup for them by hand, this simplified content model should make it easier for authors to generate them when necessary. One possible application of hand-authored too markup is to generate custom hierarchies which can be assembled on-the-fly from a library of topics marked up in DocBook.

#### 2.12. Extra-Grammatical Constraints

Grammar based validation technologies (like RELAX NG) and rule based validation technologies (like Schematron) are naturally complementary. Mixing them allows us to play to the strengths of each without stretching either to enforce constraints that they aren't readily designed to enforce.

For example, DocBook NG requires that the root element of a document have an explicit version attribute. Because there are a great many elements that can be root elements in DocBook, and because they can almost all appear as descendants of a root element as well, it would be tedious to express this constraint in RELAX NG. But it is easy in a rule-based schema language.

DocBook V5.0 uses Schematron where appropriate.

#### 2.13. Customization

From the very beginning, one of the goals of DocBook has been that users should be able to produce customizations that are either subsets of extensions of DocBook.

Customization is possible in DocBook V4.x, but because of the intricacies of XML DTD syntax and the complex and highly stylized patterns of parameter entity usage in DocBook, it's not as easy as we would like it to be.

In DocBook V5.0, we hope to take advantage of RELAX NGs more robust design (and it's lack of pernicious determinism rules) to make customization easier.

Three schema design patterns get us most of the way there.

#### 2.13.1. Logical Groupings

DocBook elements, particularly the inlines, can be divided into broad classes: general purpose, technical, error-related, operating-system related, bibliographic, publishing, etc. In DocBook V5.0, these are collected together in named patterns.

To add a new inline, endpoint for example, to the list of technical inlines, one need only extend the appropriate pattern. If an element should appear in several classes, they can all be extended in the same way:

```
db.technical.inlines |= endpoint
db.programming.inlines |= endpoint
db.os.inlines |= endpoint
```

Much the same concept was used in DocBook V4.x, where instead of patterns we had parameter entities. However, the constraints of DTD validation severely limit the circumstances under which an element can appear twice in a content model. That meant that adding an element to one parameter entity might make it an error to add it to another. Such constraints do not exist in RELAX NG which greatly simplifies the customization.

#### 2.13.2. Element Definitions

Each element in DocBook V5.0 is defined by its own pattern. To change the content model of an element, only that pattern need be redefined. To remove an element from DocBook, that pattern can be redefined as "notAllowed".

#### 2.13.3. Attribute Definitions

Each attribute list in DocBook V5.0 is defined by its own pattern. To change the list of attributes available on an element, only that pattern need be redefined. To remove all the attributes, that pattern can be redefined as "empty".

#### 2.14. Conversion

There's an XSLT 1.0 stylesheet for performing conversion from DocBook V4.x to DocBook V5.0. Presented with a valid DocBook V4.x document, it attempts to produce a valid DocBook V5.0 document.

It succeeds entirely automatically for the most part, though human intervention is suggested for constructs that might have multiple interpretations (and therefore multiple possible transformations).

Users are encouraged to report documents that are not successfully transformed by the stylesheet, especially those which do have valid DocBook V5.0 representations.

# 3. Release Notes

See http://www.relaxng.org/ for a list of tools that can validate an XML document using RELAX NG. Note that not all products are capable of evaluating the Schematron assertions in the schema.

# A. The DocBook Media Type

This appendix registers a new MIME media type, "application/docbook+xml".

# 1. Registration of MIME media type application/doc-book+xml

MIME media type name: application

MIME subtype name: docbook+xml

Required parameters: None.

Optional parameters: charset This parameter has identical semantics to the charset parameter

of the application/xml media type as specified in [rfc3023]

or its successors.

Encoding considerations: By virtue of DocBook XML content being XML, it has the same considerations

when sent as "application/docbook+xml" as does XML. See [rfc3023],

Section 3.2.

Security considerations: Several DocBook elements may refer to arbitrary URIs. In this case, the security

issues of RFC 2396, section 7, should be considered.

Interoperability considerations: None.

Published specification: This media type registration is for DocBook documents as described by

[bib.docbooktdg5].

Applications which use this media

type:

There is no experimental, vendor specific, or personal tree predecessor to "application/docbook+xml", reflecting the fact that no applications currently recognize it. This new type is being registered in order to allow for the deployment of DocBook on the World Wide Web, as a first class XML application.

Additional information: Magic number(s): There is no single initial octet sequence

that is always present in DocBook docu-

ments.

File extension(s): DocBook documents are most often

identified with the extension ".xml".

Macintosh File Type Code(s): TEXT

Person & email address to contact

for further information:

Norman Walsh, <ndw@nwalsh.com>.

Intended usage: COMMON

Author/Change controller: The DocBook specification is a work product of the DocBook Technical Com-

mittee at OASIS.

# 2. Fragment Identifiers

For documents labeled as "application/docbook+xml", the fragment identifier notation is exactly that for "application/xml", as specified in [rfc3023] or its successors.

# **B.** Acknowledgements (Non-Normative)

The following individuals have participated in the creation of this specification and are gratefully acknowledged:

#### **Participants**

- Steve Cogorno, Sun Microsystems
- · Gary Cornelius, Individual
- Adam Di Carlo, Debian
- Paul Grosso, Arbortext
- · Dick Hamilton, Individual
- Nancy Harrison, IBM
- · Scott Hudson, Individual
- · Mark Johnson, Debian
- · Gershon Joseph, Tech-Tav Documentation Ltd.
- · Jirka Kosek, Individual
- · Larry Rowland, Hewlett-Packard
- · Michael Smith, Individual
- Robert Stayton, Individual (Secretary)
- Norman Walsh, Sun Microsystems (Chair, Editor)

# C. Revision History

# 1. Changes in DocBook V5.0

There are no user-visible changes in 5.0 (Public Review Draft 1).

This version of DocBook V5.0 will become the official Committee Specification version of DocBook V5.0 as soon as the Technical Committee balloting process is finished.

# 2. Changes in DocBook V5.0CR7

There are no user-visible changes in 5.0CR7. Some of the sources we reorganized to make future customization easier.

If no bug reports are received before the November 7, 2007 DocBook TC meeting, this version will become the official DocBook V5.0 release.

# 3. Changes in DocBook V5.0CR6

This release contains a few bug fixes and improvements over V5.0CR5.

- 1. Fixed RFE 1759782: Allow uri anywhere email occurs.
- 2. Fixed RFE 1784312: Allow book to be completely empty; allow personblurb and titleabbrev in bibliographic contexts.
- 3. Fixed RFE 1795884: Allow MathML in inlineequation.
- 4. Fixed RFE 1800916: Allow keycap (and friends) in userinput.

# 4. Changes in DocBook V5.0CR5

There are no user-visible changes in DocBook V5.0CR5.

# 5. Changes in DocBook V5.0CR4

This release contains a few improvements over V5.0CR3.

- 1. Fixed RFE 1708032: Fixed pattern naming inconsistency; changed db.href.attribute to db.href.attributes.
- 2. Fixed RFE 1700154: Added sortas to termdef.
- 3. Fixed RFE 1686919: Added an NVDL rules file.
- 4. Fixed RFE 1705596: Aded db.programming.inlines (classname, exceptionname, function, initializer, interfacename, methodname, modifier, ooclass, ooexception, oointerface, parameter, returnvalue, type, and varname) to the content model of code.
- 5. Fixed RFE 1689228: Fixed typo in Schematron assertion.

# 6. Changes in DocBook V5.0CR3

This release contains a few improvements over V5.0CR2.

- 1. Fixed RFE 1679775: Changed semantics of termdef. A firstterm is now required (instead of a glossterm as in previous releases).
- 2. Fixed RFE 1673820: Adopted "http://docbook.org/xlink/role/olink" as an XLink role value (xlink:role) to identify OLinks expressed using XLink attributes.
- 3. Allow info in HTML tables.
- 4. Fixed RFE 1682917: Added pgwide attribute to example.
- 5. Fixed RFE 1644553: Added label attribute to CALS and HTML tables.
- 6. Fixed RFE 1588693: Added an acknowledgements element, peer to dedication, replacing ackno which had only been available at the end of article.

# 7. Changes in DocBook V5.0CR2

This release contains a few improvements over V5.0CR1 and a few bug fixes.

- 1. Fixed RFE 1630203: Allow empty glossary.
- 2. Fixed RFE 1627845: Allow optional caption on CALS table and informaltable.
- 3. Related to RFE 1627845: Allow inlines in HTML table caption.
- 4. Fixed RFE 1589139 (and RFE 1621178): Allow title and titleabbrev on qandaentry.
- 5. Fixed RFE 1675932: Restore localname, prefix and namespace as class attribute values on tag.
- 6. Fixed RFE 1669465: Schematron rules should refer to @xml:id, not @id.

# 8. Changes in DocBook V5.0CR1

This release contains a few improvements over V5.0b9 and a few bug fixes.

- 1. Made the content model of blockquote broader. It was restricted too far in the transition to 5.0.
- 2. Fixed RFE 1575537: Allow markup from other namespaces in info.
- 3. Fix the content model of ackno so that it's the same as DocBook 4.x.
- 4. Fix bug where caption was accidentally allowed in CALS tables.

# 9. Changes in DocBook V5.0b9

This release contains several improvements over V5.0b8.

- 1. Fixed RFE 1537424: Allow jobtitle inline.
- 2. Fixed typo; titles are now required on task, consistent with DocBook V4.x.

- 3. Fixed RFE 1554914: Make targetdoc attribute on olink optional.
- 4. Fixed RFE 1568417: Don't generate duplicate Schematron rules.
- 5. Fixed RFE 1568419: Inverted Schematron assertion for termdef.

# 10. Changes in DocBook V5.0b8

This release contains several improvements over V5.0b7.

- 1. Fixed RFE 1535166: Improve the data types of attributes in DocBook.
- 2. Fixed RFE 1549632: The inlineequation element should use inlinemedia object not media object.
- 3. A number of small documentation improvements in the area of attribute and attribute enumerations.

# 11. Changes in DocBook V5.0b7

This release contains several improvements over V5.0b6.

- 1. Fixed RFE 1520074: Define separate patterns for all the effectivity attributes to make customization easier.
- 2. Attempted to address RFE 1512505: Added an audience effectivity attribute.
- 3. Rename audience, origin, and level on simplemsgentry to msgaud, msgorig, and msglevel, respectively. This is a better parallel with the descendent elements of msgentry and avoids a conflict with the newly introduced audience effectivity attribute.
- 4. Added startinglinenumber attribute to orderedlist.
- Fixed bug where one of fileref or entityref was required on imagedata even when the content was inline MathML or SVG.

# 12. Changes in DocBook V5.0b6

This release contains several improvements over V5.0b5.

- 1. Fixed RFE 1434294: Allow MathML and SVG in imagedata. Note: SVG is no longer allowed as an *alternative* to imagedata. The alignment, scaling, and other presentational attributes are on imagedata so it seems more reasonable to allow SVG and MathML inside it.
- 2. Fixed RFE 1468921: Add person element. Added person and org.
- 3. Fixed RFE 1306027: Support for aspect-oriented programming. Allow modifier to appear in more places, and allow xml:space on modifier.
- 4. Added db.publishing.inlines to db.bibliographic.elements so that, for example, foreign-phrase can be used in bibliomixed.

# 13. Changes in DocBook V5.0b5

This release contains several improvements over V5.0b4.

- 1. Restored the class attribute on refmiscinfo (removing the type attribute introduced in V5.0b4). The class attribute is now an enumerated list with the standard otherclass extension point.
- 2. Added parameter to db.technical.inlines. This allows parameter to occur in places like user input and computer output.
- 3. Allow XInclude elements in info elements (in the **docbookxi** schemas).
- 4. Fixed bugs in the build process that resulted in broken DTD versions of beta 4 and earlier betas.

# 14. Changes in DocBook V5.0b4

This release contains several improvements over V5.0b3.

- Fixed RFE 1416903: Added a cover element to hold additional material for document covers. Updated reference documentation.
- 2. Corrected a typo in the list of values allowed on the class attribute of biblioid: changed "pubnumber" to "pubsnumber" (note the "s"). This is consistent with its use as a replacement for the pubsnumber tag that has been removed in DocBook V5.0.
- 3. Fixed a bug in the content model of the various "info" elements. In previous beta releases, the title-related elements (title, titleabbrev, and subtitle) were erroneously required to appear first. The requirement is only that they appear exactly or at most once, depending on the context.
- 4. Renamed the "sgmlcomment" attribute value of the class attribute of tag. There's no significant difference between XML and SGML comments and the "SGML" name implies that there ought to be an "xmlcomment" value, which there is not. The new value is simply "comment".
- 5. Renamed the "class" attribute of refmiscinfo. The DocBook semantics of class attributes is that they have enumerated values. This attribute should always have been called "type" as it is now.
- 6. Updated renderas on bridgehead and class on othercredit to have "attribute/otherattribute" co-constraints. (In other words, if you select "other" for renderas on bridgehead or class on othercredit, you have to also provide a value for otherrenderas or othercredit, respectively.
- 7. Changed width attribute in media objects to be "text" instead of "xs:integer".
- 8. Fixed bug in the build process that resulted in unusable XML Schema versions of beta 2 and beta 3.
- 9. Improved reference documentation for attributes on many elements.

# 15. Changes in DocBook V5.0b3

This release contains several small improvements over V5.0b2.

- 1. Fixed RFE 1358844: allow multiple imageobjects inside an imageobjectco. Updated reference documentation.
- 2. Restored default values to the type attribute on simplelist and the choice and rep attributes on method-param, arg, and group. Fixed a bug in paramdef where plain was accidentally allowed as a choice. These defaults are reflected in the generated XML DTD as well.
- 3. Reduced the content model of blockquote which seemed way too broad.

4. Improved reference documentation for attributes on many elements.

# 16. Changes in DocBook V5.0b2

This release addresses several bugs identified in V5.0b1.

- 1. When SVG or MathML are used, allow more than one element from the respective namespace to be used in the appropriate location.
- 2. Fixed RFE 1356238: the xrefstyle attribute on olink is now "text" rather than "xsd:IDREF".
- 3. Fixed RFE 1380477: Make xml:id optional on areas within areaset; allow linking attributes on areaset; establish the semantics that an area inside an areaset inherits its linking attributes from the areaset if it doesn't have linking attributes of its own.
- 4. Allow alt inside equation, informal equation, and inline equation.
- 5. Fixed RFE 1356254: dbforms.rnc schema now supports the HTML form elements.