



Namespaces in XML 1.1 (Second Edition)

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Please refer to the [errata](#) for this document, which may include some normative corrections.

See also [translations](#).

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Abstract

XML namespaces provide a simple method for qualifying element and attribute names used in Extensible Markup Language documents by associating them with namespaces identified by IRI references.

Status of this Document

This section describes the status of this document at the time of its publication. Other documents may supersede this document. A list of current W3C publications and the latest revision of this technical report can be found in the [W3C technical reports index](#) at <http://www.w3.org/TR/>.

This document is a product of the [XML Core Working Group](#) as part of the [W3C XML Activity](#). The English version of this specification is the only normative version. However, for translations of this document, see <http://www.w3.org/2003/03/Translations/byTechnology?technology=xml-names-11>.

Known implementations are documented in the [Namespaces 1.1 implementation report](#) (all known Namespaces 1.1 implementations also support Namespaces 1.0). A test suite is also available via the [XML Test Suite](#) page.

This second edition incorporates all known errata as of the publication date. It supersedes the previous [W3C Recommendation of 4 February 2004](#). For the convenience of readers, an [XHTML version with color-coded revision indicators](#) is also provided.

Please report errors in this document to xml-names-editor@w3.org; public [archives](#) are available. The errata list for this document is available at <http://www.w3.org/XML/2006/xml-names11-errata>.

This document has been reviewed by W3C Members, by software developers, and by other W3C groups and interested parties, and is endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited from another document. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

This document is governed by the [24 January 2002 CPP](#) as amended by the [W3C Patent Policy Transition Procedure](#). W3C maintains a [public list of any patent disclosures](#) made in connection with the deliverables of the group; that page also includes instructions for disclosing a patent. An individual who has actual

knowledge of a patent which the individual believes contains [Essential Claim\(s\)](#) must disclose the information in accordance with [section 6 of the W3C Patent Policy](#).

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1 Motivation and Summary

We envision applications of Extensible Markup Language (XML) where a single XML document may contain elements and attributes (here referred to as a "markup vocabulary") that are defined for and used by multiple software modules. One motivation for this is modularity: if such a markup vocabulary exists which is well-understood and for which there is useful software available, it is better to re-use this markup rather than re-invent it.

Such documents, containing multiple markup vocabularies, pose problems of recognition and collision. Software modules need to be able to recognize the elements and attributes which they are designed to process, even in the face of "collisions" occurring when markup intended for some other software package uses the same element name or attribute name.

These considerations require that document constructs should have names constructed so as to avoid clashes between names from different markup vocabularies. This specification describes a mechanism, *XML namespaces*, which accomplishes this by assigning [expanded names](#) to elements and attributes.

1.1 A Note on Notation and Usage

Where *emphasized*, the key words *must*, *must not*, *required*, *should*, *should not*, *may* in this document are to be interpreted as described in [\[Keywords\]](#).

Note that many of the nonterminals in the productions in this specification are defined not here but in the XML specification [\[XML\]](#). When nonterminals defined here have the same names as nonterminals defined in the XML specification, the productions here in all cases match a subset of the strings matched by the corresponding ones there.

In this document's productions, the `NSC` is a "Namespace Constraint", one of the rules that documents conforming to this specification *must* follow.

2 XML Namespaces

2.1 Basic Concepts

[Definition: An **XML namespace** is identified by an IRI reference [\[RFC3987\]](#); element and attribute names may be placed in an XML namespace using the mechanisms described in this specification.]

[Definition: An **expanded name** is a pair consisting of a [namespace name](#) and a [local name](#).] [Definition: For a name *N* in a namespace identified by an IRI *I*, the **namespace name** is *I*. For a name *N* that is not in a namespace, the **namespace name** has no value.] [Definition: In either case the **local name** is *N*.] It is this combination of the universally managed IRI namespace with the vocabulary's local names that is effective in avoiding name clashes.

IRI references can contain characters not allowed in names, and are often inconveniently long, so expanded names are not used directly to name elements and attributes in XML documents. Instead [qualified names](#) are used. [Definition: A **qualified name** is a name subject to namespace interpretation.] In documents conforming to this specification, element and attribute names appear as qualified names. Syntactically, they are either [prefixed names](#) or [unprefixed names](#). An attribute-based declaration syntax is provided to bind prefixes to namespace names and to bind a default namespace that applies to unprefixed element names; these declarations are scoped by the elements on which they appear so that different bindings may apply in different parts of a document. Processors conforming to this specification *must* recognize and act on these declarations and prefixes.

2.2 Use of IRIs as Namespace Names

The empty string, though it is a legal IRI reference, cannot be used as a namespace name.

The use of relative IRI references, including same-document references, in namespace declarations is deprecated.

Note:

This deprecation of relative URI references was decided on by a W3C XML Plenary Ballot [\[Relative URI deprecation\]](#). It also declares that "later specifications such as DOM, XPath, etc. will define no interpretation for them".

2.3 Comparing IRI References

IRI references identifying namespaces are compared when determining whether a name belongs to a given namespace, and whether two names belong to the same namespace. [Definition: The two IRIs are treated as strings, and they are **identical** if and only if the strings are identical, that is, if they are the same sequence of characters.] The comparison is case-sensitive, and no %-escaping is done or undone.

A consequence of this is that IRI references which are not identical in this sense may resolve to the same resource. Examples include IRI references which differ only in case or %-escaping, or which are in external entities which have different base URIs (but note that relative IRIs are deprecated as namespace names).

In a namespace declaration, the IRI reference is the [normalized value](#) of the attribute, so replacement of XML character and entity references has already been done before any comparison.

Examples:

The IRI references below are all different for the purposes of identifying namespaces, since they differ in case:

- <http://www.example.org/wine>
- <http://www.Example.org/wine>
- <http://www.example.org/Wine>

The IRI references below are also all different for the purposes of identifying namespaces:

- <http://www.example.org/rosé>
- <http://www.example.org/ros%c3%a9>

- `http://www.example.org/ros%c3%A9`
- `http://www.example.org/ros%C3%a9`
- `http://www.example.org/ros%C3%A9`

As are these:

- `http://www.example.org/~wilbur`
- `http://www.example.org/%7ewilbur`
- `http://www.example.org/%7Ewilbur`

If the entity **acute** has been defined to be **é**, the start tags below all contain namespace declarations binding the prefix **p** to the same IRI reference, `http://example.org/rosé`.

- `<p:foo xmlns:p="http://example.org/rosé">`
- `<p:foo xmlns:p="http://example.org/rosé">`
- `<p:foo xmlns:p="http://example.org/rosé">`
- `<p:foo xmlns:p="http://example.org/rosé">`
- `<p:foo xmlns:p="http://example.org/rosé">`

Because of the risk of confusion between IRIs that would be equivalent if dereferenced, the use of %-escaped characters in namespace names is strongly discouraged.

3 Declaring Namespaces

[Definition: A namespace (or more precisely, a namespace binding) is **declared** using a family of reserved attributes. Such an attribute's name must either be **xmlns** or begin **xmlns:**. These attributes, like any other XML attributes, may be provided directly or by [default](#).]

Attribute Names for Namespace Declaration

- | | | | | |
|-----|-----------------|-----|---------------------------------------------------------------------|--------------------------------------------------------------|
| [1] | NSAttName | ::= | PrefixedAttName
 DefaultAttName | |
| [2] | PrefixedAttName | ::= | 'xmlns:' NCName | [NSC: Reserved Prefixes and Namespace Names] |
| [3] | DefaultAttName | ::= | 'xmlns' | |
| [4] | NCName | ::= | NCNameStartChar
NCNameChar * | <i>/* An XML Name, minus the ":" */</i> |
| [5] | NCNameChar | ::= | NameChar - ':' | |
| [6] | NCNameStartChar | ::= | NameStartChar - ':' | |

The attribute's [normalized value](#) *must* be either an IRI reference — the [namespace name](#) identifying the namespace — or an empty string. The namespace name, to serve its intended purpose, *should* have the characteristics of uniqueness and persistence. It is not a goal that it be directly usable for retrieval of a schema (if any exists). Uniform Resource Names [\[RFC2141\]](#) is an example of a syntax that is designed with these goals in mind. However, it should be noted that ordinary URLs can be managed in such a way as to achieve these same goals.

[Definition: If the attribute name matches [PrefixedAttName](#), then the [NCName](#) gives the **namespace prefix**, used to associate element and attribute names with the [namespace name](#) in the attribute value in the scope of the element to which the declaration is attached.]

[Definition: If the attribute name matches [DefaultAttName](#), then the [namespace name](#) in the attribute value is that of the **default namespace** in the scope of the element to which the declaration is attached.] Default namespaces and overriding of declarations are discussed in [6 Applying Namespaces to Elements and Attributes](#).

An example namespace declaration, which associates the namespace prefix **edi** with the namespace name `http://ecommerce.example.org/schema`:

```
<x xmlns:edi='http://ecommerce.example.org/schema'>
  <!-- the "edi" prefix is bound to http://ecommerce.example.org/schema
        for the "x" element and contents -->
</x>
```

Namespace constraint: Reserved Prefixes and Namespace Names

The prefix **xml** is by definition bound to the namespace name `http://www.w3.org/XML/1998/namespace`. It *may*, but need not, be declared, and *must not* be undeclared or bound to any other namespace name. Other prefixes *must not* be bound to this namespace name, and it *must not* be declared as the default namespace.

The prefix **xmlns** is used only to declare namespace bindings and is by definition bound to the namespace name `http://www.w3.org/2000/xmlns/`. It *must not* be declared or undeclared. Other prefixes *must not* be bound to this namespace name, and it *must not* be declared as the default namespace. Element names *must not* have the prefix `xmlns`.

All other prefixes beginning with the three-letter sequence x, m, l, in any case combination, are reserved. This means that:

- users *should not* use them except as defined by later specifications
- processors *must not* treat them as fatal errors.

Though they are not themselves reserved, it is inadvisable to use prefixed names whose LocalPart begins with the letters x, m, l, in any case combination, as these names would be reserved if used without a prefix.

4 Qualified Names

In XML documents conforming to this specification, some names (constructs corresponding to the nonterminal [Name](#)) *must* be given as [qualified names](#), defined as follows:

Qualified Name

- [7] QName ::= [PrefixedName](#)
 | [UnprefixedName](#)
- [8] PrefixedName ::= [Prefix](#) ':' [LocalPart](#)
- [9] UnprefixedName ::= [LocalPart](#)
- [10] Prefix ::= [NCName](#)
- [11] LocalPart ::= [NCName](#)

The [Prefix](#) provides the [namespace prefix](#) part of the qualified name, and *must* be associated with a namespace IRI reference in a [namespace declaration](#). [Definition: The [LocalPart](#) provides the **local part** of the qualified name.]

Note that the prefix functions *only* as a placeholder for a namespace name. Applications *should* use the namespace name, not the prefix, in constructing names whose scope extends beyond the containing document.

5 Using Qualified Names

In XML documents conforming to this specification, element names are given as [qualified names](#), as follows:

Element Names

- [12] STag ::= '<' QName (S Attribute)* S? '>' [\[NSC: Prefix Declared\]](#)
- [13] ETag ::= '</' QName S? '>' [\[NSC: Prefix Declared\]](#)
- [14] EmptyElemTag ::= '<' QName (S Attribute)* S? '/>' [\[NSC: Prefix Declared\]](#)

An example of a qualified name serving as an element name:

```
<!-- the 'price' element's namespace is http://ecommerce.example.org/schema -->
<edi:price xmlns:edi='http://ecommerce.example.org/schema' units='Euro'>32.18</edi:price>
```

Attributes are either [namespace declarations](#) or their names are given as [qualified names](#):

Attribute

```
[15] Attribute ::= NSAttName Eq AttValue
                | QName Eq AttValue [NSC: Prefix Declared]
```

An example of a qualified name serving as an attribute name:

```
<x xmlns:edi='http://ecommerce.example.org/schema'>
  <!-- the 'taxClass' attribute's namespace is http://ecommerce.example.org/schema -->
  <lineItem edi:taxClass="exempt">Baby food</lineItem>
</x>
```

Namespace constraint: Prefix Declared

The namespace prefix, unless it is `xml` or `xmlns`, *must* have been declared in a [namespace declaration](#) attribute in either the start-tag of the element where the prefix is used or in an ancestor element (i.e. an element in whose [content](#) the prefixed markup occurs). Furthermore, the attribute value in the innermost such declaration *must not* be an empty string.

This constraint may lead to operational difficulties in the case where the namespace declaration attribute is provided, not directly in the XML [document entity](#), but via a default attribute declared in an external entity. Such declarations may not be read by software which is based on a non-validating XML processor. Many XML applications, presumably including namespace-sensitive ones, fail to require validating processors. If correct operation with such applications is required, namespace declarations *must* be provided either directly or via default attributes declared in the [internal subset of the DTD](#).

Element names and attribute names are also given as qualified names when they appear in declarations in the [DTD](#):

Qualified Names in Declarations

```
[16] doctypeddecl ::= '<!DOCTYPE' S QName (S ExternalID)? S? ('[' (markupdecl | PEReference
| S)* ']' S?)? '>'
[17] elementdecl ::= '<!ELEMENT' S QName S contentspec S? '>'
[18] cp           ::= (QName | choice | seq) ('?' | '*' | '+')?
[19] Mixed       ::= ((' S? '#PCDATA' (S? '|' S? QName)* S? ')*'
| (' S? '#PCDATA' S? '))
[20] AttlistDecl ::= '<!ATTLIST' S QName AttDef* S? '>'
[21] AttDef      ::= S (QName | NSAttName) S AttType S DefaultDecl
```

Note that DTD-based validation is not namespace-aware in the following sense: a DTD constrains the elements and attributes that may appear in a document by their uninterpreted names, not by (namespace name, local name) pairs. To validate a document that uses namespaces against a DTD, the same prefixes must be used in the DTD as in the instance. A DTD may however indirectly constrain the namespaces used in a valid document by providing `#FIXED` values for attributes that declare namespaces.

6 Applying Namespaces to Elements and Attributes

6.1 Namespace Scoping

The scope of a namespace declaration declaring a prefix extends from the beginning of the start-tag in which it appears to the end of the corresponding end-tag, excluding the scope of any inner declarations with the same `NSAttName` part. In the case of an empty tag, the scope is the tag itself.

Such a namespace declaration applies to all element and attribute names within its scope whose prefix matches that specified in the declaration.

The [expanded name](#) corresponding to a prefixed element or attribute name has the IRI to which the [prefix](#) is bound as its [namespace name](#), and the [local part](#) as its [local name](#).

```
<?xml version="1.1"?>

<html:html xmlns:html='http://www.w3.org/1999/xhtml'>

  <html:head><html:title>Frobnostration</html:title></html:head>
  <html:body><html:p>Moved to
    <html:a href='http://frob.example.com'>here.</html:a></html:p></html:body>
</html:html>
```

Multiple namespace prefixes can be declared as attributes of a single element, as shown in this example:

```
<?xml version="1.1"?>
<!-- both namespace prefixes are available throughout -->
<bk:book xmlns:bk='urn:loc.gov:books'
  xmlns:isbn='urn:ISBN:0-395-36341-6'>
  <bk:title>Cheaper by the Dozen</bk:title>
  <isbn:number>1568491379</isbn:number>
</bk:book>
```

The attribute value in a namespace declaration for a prefix *may* be empty. This has the effect, within the scope of the declaration, of removing any association of the prefix with a namespace name. Further declarations *may* re-declare the prefix again:

```
<?xml version="1.1"?>
<x xmlns:n1="http://www.w3.org">
  <n1:a/> <!-- legal; the prefix n1 is bound to http://www.w3.org -->
  <x xmlns:n1="">
    <n1:a/> <!-- illegal; the prefix n1 is not bound here -->
    <x xmlns:n1="http://www.w3.org">
      <n1:a/> <!-- legal; the prefix n1 is bound again -->
    </x>
  </x>
</x>
```

6.2 Namespace Defaulting

The scope of a [default namespace](#) declaration extends from the beginning of the start-tag in which it appears to the end of the corresponding end-tag, excluding the scope of any inner default namespace declarations. In the case of an empty tag, the scope is the tag itself.

A default namespace declaration applies to all unprefixes element names within its scope. Default namespace declarations do not apply directly to attribute names; the interpretation of unprefixes attributes is determined by the element on which they appear.

If there is a default namespace declaration in scope, the [expanded name](#) corresponding to an unprefixes element name has the IRI of the [default namespace](#) as its [namespace name](#). If there is no default namespace declaration in scope, the namespace name has no value. The namespace name for an unprefixes attribute name always has no value. In all cases, the [local name](#) is [local part](#) (which is of course the same as the unprefixes name itself).

```
<?xml version="1.1"?>
<!-- elements are in the HTML namespace, in this case by default -->
<html xmlns='http://www.w3.org/1999/xhtml'>
  <head><title>Frobnostration</title></head>
  <body><p>Moved to
    <a href='http://frob.example.com'>here</a>.</p></body>
</html>
```

```
<?xml version="1.1"?>
<!-- unprefixes element types are from "books" -->
<book xmlns='urn:loc.gov:books'
  xmlns:isbn='urn:ISBN:0-395-36341-6'>
  <title>Cheaper by the Dozen</title>
  <isbn:number>1568491379</isbn:number>
</book>
```

A larger example of namespace scoping:

```
<?xml version="1.1"?>
<!-- initially, the default namespace is "books" -->
<book xmlns='urn:loc.gov:books'
      xmlns:isbn='urn:ISBN:0-395-36341-6'>
  <title>Cheaper by the Dozen</title>
  <isbn:number>1568491379</isbn:number>
  <notes>
    <!-- make HTML the default namespace for some commentary -->
    <p xmlns='http://www.w3.org/1999/xhtml'>
      This is a <i>funny</i> book!
    </p>
  </notes>
</book>
```

The attribute value in a default namespace declaration *may* be empty. This has the same effect, within the scope of the declaration, of there being no default namespace.

```
<?xml version='1.1'?>
<Beers>
  <!-- the default namespace inside tables is that of HTML -->
  <table xmlns='http://www.w3.org/1999/xhtml'>
    <th><td>Name</td><td>Origin</td><td>Description</td></th>
    <tr>
      <!-- no default namespace inside table cells -->
      <td><brandName xmlns="">Huntsman</brandName></td>
      <td><origin xmlns="">Bath, UK</origin></td>
      <td>
        <details xmlns=""><class>Bitter</class><hop>Fuggles</hop>
          <pro>Wonderful hop, light alcohol, good summer beer</pro>
          <con>Fragile; excessive variance pub to pub</con>
        </details>
      </td>
    </tr>
  </table>
</Beers>
```

6.3 Uniqueness of Attributes

In XML documents conforming to this specification, no tag may contain two attributes which:

1. have identical names, or
2. have qualified names with the same [local part](#) and with [prefixes](#) which have been bound to [namespace names](#) that are [identical](#).

This constraint is equivalent to requiring that no element have two attributes with the same [expanded name](#).

For example, each of the `bad` empty-element tags is illegal in the following:

```
<!-- http://www.w3.org is bound to n1 and n2 -->
<x xmlns:n1="http://www.w3.org"
   xmlns:n2="http://www.w3.org" >
  <bad a="1"      a="2" />
  <bad n1:a="1"  n2:a="2" />
</x>
```

However, each of the following is legal, the second because the default namespace does not apply to attribute names:

```
<!-- http://www.w3.org is bound to n1 and is the default -->
<x xmlns:n1="http://www.w3.org"
   xmlns="http://www.w3.org" >
  <good a="1"      b="2" />
  <good a="1"      n1:a="2" />
</x>
```

7 Conformance of Documents

This specification applies to XML 1.1 documents. To conform to this specification, a document *must* be well-formed according to the XML 1.1 specification [XML 1.1].

In XML documents which conform to this specification, element and attribute names *must* match the production for [QName](#) and *must* satisfy the "Namespace Constraints". All other tokens in the document which are *required*, for XML 1.1 well-formedness, to match the XML production for [Name](#) *must* match this specification's production for [NCName](#).

[Definition: A document is **namespace-well-formed** if it conforms to this specification.]

It follows that in a namespace-well-formed document:

- All element and attribute names contain either zero or one colon;
- No entity names, processing instruction targets, or notation names contain any colons.

In addition, a namespace-well-formed document may also be namespace-valid.

[Definition: A namespace-well-formed document is **namespace-valid** if it is valid according to the XML 1.1 specification, and all tokens other than element and attribute names which are *required*, for XML 1.1 validity, to match the XML production for [Name](#) match this specification's production for [NCName](#).]

It follows that in a namespace-valid document:

- No attributes with a declared type of **ID**, **IDREF(S)**, **ENTITY(IES)**, or **NOTATION** contain any colons.

8 Conformance of Processors

To conform to this specification, a processor *must* report violations of namespace well-formedness, with the exception that it is not *required* to check that namespace names are legal IRIs.

[Definition: A validating XML processor that conforms to this specification is **namespace-validating** if in addition it reports violations of namespace validity.]

A Normative References

Keywords

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RFC3986

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[RFC 3629: UTF-8, a transformation format of ISO 10646](#), F. Yergeau, ed. IETF (Internet Engineering Task Force), November 2003. Available at <http://www.rfc-editor.org/rfc/rfc3629.txt>

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[Internationalized Resource Identifiers \(IRIs\)](#), M. Duerst and M. Suignard eds. January 2005. Available at <http://www.rfc-editor.org/rfc/rfc3987.txt>.

XML

[Extensible Markup Language \(XML\) 1.0 \(Fourth Edition\)](#), Tim Bray, Jean Paoli, C. M. Sperberg-McQueen, Eve Maler, and François Yergeau eds. W3C (World Wide Web Consortium), 16 August 2006. Available at <http://www.w3.org/TR/2006/REC-xml-20060816/>.

XML 1.1

[Extensible Markup Language \(XML\) 1.1 \(Second Edition\)](#), Tim Bray, Jean Paoli, C. M. Sperberg-McQueen, Eve Maler, François Yergeau, and John Cowan eds. W3C (World Wide Web Consortium), 16 August 2006. Available at <http://www.w3.org/TR/2006/REC-xml11-20060816/>.

B Other references (Non-Normative)

1.0 Errata

[Namespaces in XML Errata](#). W3C (World Wide Web Consortium). Available at <http://www.w3.org/XML/xml-names-19990114-errata>.

1.1 Errata

[Namespaces in XML 1.1 Errata](#). W3C (World Wide Web Consortium). Available at <http://www.w3.org/XML/2004/xml-names11-errata>.

Relative URI deprecation

[Results of W3C XML Plenary Ballot on relative URI References In namespace declarations 3-17 July 2000](#), Dave Hollander and C. M. Sperberg-McQueen, 6 September 2000. Available at <http://www.w3.org/2000/09/xppa>.

Requirements

[Namespaces in XML 1.1 Requirements](#), Jonathan Marsh, ed. W3C (World Wide Web Consortium), March 2002. Available at <http://www.w3.org/TR/2002/WD-xml-names11-req-20020403/>.

C The Internal Structure of XML Namespaces (Non-Normative)

This appendix has been deleted.

D Changes since version 1.0 (Non-Normative)

This version incorporates the errata to version 1.0 as of 6 December 2002 [[1.0 Errata](#)]. There are two further substantive changes:

- A mechanism is provided for undeclaring prefixes;
- Namespace names are IRIs, rather than URIs.

There are several editorial changes, including a number of terminology changes and additions intended to produce greater consistency. The non-normative appendix "The Internal Structure of XML Namespaces" has been removed.

D.1 Changes since version 1.1

This version incorporates the errata to version 1.1 as of 1 June 2006 [[1.1 Errata](#)].

Because the final version of the IRI RFC had not yet been published, the first edition of version 1.1 included its own definition of IRIs. This has been removed, and replaced with a reference to the RFC.

E Acknowledgements (Non-Normative)

This work reflects input from a very large number of people, including especially the participants in the World Wide Web Consortium XML Working Group and Special Interest Group and the participants in the W3C Metadata Activity. The contributions of Charles Frankston of Microsoft were particularly valuable.