XHTML-Print

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Abstract

XHTML-Print is member of the family of XHTML Languages defined by the *Modularization of XHTML* [XHTMLMOD [p.49]]. It is designed to be appropriate for printing from mobile devices to low-cost printers that might not have a full-page buffer and that generally print from top-to-bottom and left-to-right with the paper in a portrait orientation. XHTML-Print is also targeted at printing in environments where it is not feasible or desirable to install a printer-specific driver and where some variability in the formatting of the output is acceptable.

Status of This Document

This section describes the status of this document at the time of its publication. Other documents may supersede this document. The latest status of this document series is maintained at the W3C.

All sections of this document are normative unless noted as informative.

This document contains the XHTML™-Print W3C Working Draft of 29 July 2003 and is a Last Call Working Draft for review by W3C members and other interested parties. This document is in the Last Call review period, which ends on *7 September 2003*. Comments are to be sent to www-html-editor@w3.org (archive). This specification is based, in large part, on a work by the same name, *XHTML™-Print* [XHTMLPRINT [p.51]] from the Printer Working Group (PWG), a program of the IEEE Industry Standard and Technology Organization.

This document has been produced by the W3C HTML Working Group (*members only*) as part of the W3C HTML Activity and is released as a Last Call Working Draft with the consensus of the group. The goals of the HTML Working Group are discussed in the HTML Working Group charter.

Publication as a Working Draft does not imply endorsement by the W3C Membership. This is a draft document and *MAY* be updated, replaced or obsoleted by other documents at any time. It is inappropriate to cite this document as other than "work in progress." A list of W3C Recommendations and other technical reports can be found at http://www.w3.org/TR/.

Patent disclosures relevant to this specification can be found on the Working Group's patent disclosure page.

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1. Introduction

All sections of this document are normative unless noted as informative.

1.1. XHTML for Printing

This section is informative.

This document specifies a simple XHTML based data stream suitable for printing as well as display. It is based on *XHTML Basic* [XHTMLBASIC [p.49]] with the addition of Cascading Style Sheets (CSS) from *CSS Print Profile* [CSSPP [p.49]]. Its targeted usage is for printing in environments where it is not feasible or desirable to install a printer-specific driver and where some variability in the formatting of the output is acceptable. Throughout this document this data stream is called "XHTML-Print."

XHTML-Print is designed to be appropriate for low-cost printers that might not have a full-page buffer and that generally print from top-to-bottom and left-to-right with the paper in a portrait orientation. For other printers (i.e., those that print in another direction or orientation) a full-page buffer could be needed.

XHTML-Print is not appropriate when strict layout consistency and repeatability across printers are needed. The design objective of XHTML-Print is to provide a relatively simple, broadly supportable page description format where content preservation and reproduction are the goal, i.e. "Content is King." Traditional printer page description formats such as PostScript or PCL are more suitable when strict layout control is needed. XHTML-Print does not utilize bi-directional communications with the printer either for capabilities or status inquiries.

This document creates a set of conformance criteria for XHTML-Print. It references style sheet constructs drawn from *CSS2* [CSS2 [p.50]] and proposed for *CSS3 Paged Media* [PAGEMEDIA [p.50]] as defined in the *CSS Print Profile* [CSSPP [p.49]] to provide a strong basis for rich printing results without a detailed understanding of each individual printer's characteristics.

It also defines an extension set that provides stronger layout control for the printing of mixed text and images, tables and image collections.

The document type definition for XHTML-Print is implemented based on the XHTML modules defined in *Modularization of XHTML* [XHTMLMOD [p.49]].

1.2. Terminology

The keywords "*MUST*", "*SHALL*", "*MUST NOT*", "*SHALL NOT*", "*REQUIRED*", "*SHOULD*", "*SHOULD NOT*", "*RECOMMENDED*", "*MAY*", and "*OPTIONAL*" when used in this document are to be interpreted as described in *RFC 2119* [RFC2119 [p.50]]. However, for readability, these words do not appear in all uppercase letters in this specification.

1.3. Design Rationale

This section explains why certain HTML features are not part of XHTML-Print and any special circumstances concerning a module and printing.

1.3.1. Script and Events

Scripts, as programs that are executed in conjunction with a document, are not relevant to the printed page. However, documents can provide information as an alternative to a script. Therefore, the script module is part of XHTML-Print since the content of the `script` element *MUST* be discarded and the content of the `noscript` element printed.

Events are not applicable to static, printed versions of a document. Therefore, the Intrinsic Events module is not part of XHTML-Print.

1.3.2. Presentation

Many simple printers cannot print a wider variety of fonts than the generic serif, sans serif and monospace. It is *RECOMMENDED* that style sheets be used to create a presentation that is appropriate for a particular category of printer. How printers are categorized, what those categories are, how a printer identifies itself as a member of a category, and how style sheets are selectively applied based on category, is outside the scope of this document.

The Presentation module ([XHTMLMOD [p.49]], section 5.4.1) is supported to allow very simple printers to support basic font variants and rules without the need to implement support for CSS as *REQUIRED* by *CSS Print Profile* [CSSPP [p.49]]. However, printers *SHOULD* provide support for CSS within the limits of their device.

1.3.3. Forms

Basic XHTML forms ([XHTMLMOD [p.49]], section 5.5.1) are supported. Content developers *SHOULD* keep in mind that users might not be able to input many characters from some devices (e.g. from a mobile phone). Furthermore, developers are cautioned that a printer prints a static version of a form, and the visual appearance of a form depends heavily on the implementation.

1.3.4. Tables

Basic XHTML tables ([XHTMLMOD [p.49]], section 5.6.1) are supported, but tables can be difficult to format on very low resource devices. Furthermore, content developers are cautioned that in the Basic Tables Module, nesting of tables is prohibited.

1.3.5. Frames

Frames are not supported. Frames depend on a screen interface and therefore are not applicable to printers.

1.3.6. Attributes

XHTML-Print is a member of the family of XHTML languages defined by *Modularization of XHTML* [XHTMLMOD [p.49]]. Therefore, the elements and attributes in the modules that make up XHTML-Print are all valid constructs of the language. However, not all the attributes are applicable to a rendering of an XHTML-Print document in a printed media, especially those that are integral to a dynamic display of the document in a browser and the submission of a form. Furthermore, special attention is given to simple printers and some attributes are deemed too complex for a such a printer to render. These attributes are treated as discretionary in that a conforming printer is not *REQUIRED* to support them, but if a printer wishes to provide that support, there are requirements stated for consistency in the implementation of extensions.

2. Conformance

2.1. Document Conformance

A conforming XHTML-Print document is a document that requires only the facilities described as mandatory in this specification. Such a document *SHALL* meet all of the following criteria:

1. The document *SHALL* validate against the DTD found in Appendix C [p.41] and conform to the constraints expressed in Design Rationale [p.6] .
2. The root element of the document *SHALL* be `<html>`.
3. The name of the default namespace on the root element *SHALL* be the XHTML namespace name, `http://www.w3.org/1999/xhtml`.
4. There *SHALL* be a DOCTYPE declaration in the document prior to the root element. If present, the public identifier included in the DOCTYPE declaration *SHALL* reference the DTD found in Appendix C [p.41] using its Formal Public Identifier. The system identifier *MAY* be modified appropriately.
   <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
   "http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">

5. The DTD subset *MUST NOT* be used to override any parameter entities in the DTD.

The MIME type used to refer to a conforming XHTML-Print document *SHALL* be "application/xhtml+xml". An *OPTIONAL* "charset" parameter *MAY* be provided with the MIME type. The only valid value for the "charset" parameter is "utf-8". Invalid values *MUST* be ignored and the result be as if the value were "utf-8". Usage of the *OPTIONAL* "charset" parameter is as described in section 3.2 of *RFC3023 - XML Media Types* [RFC3023 [p.51]].

2.2. Client Conformance

1. Clients *SHALL* produce a well-formed XHTML-Print document as defined in XHTML 1.0 [XHTML1 [p.49]] and in Document Conformance [p.9] .
2. Beyond number 1 above, clients are not *REQUIRED* to use more of the XHTML-Print elements or Style Sheet attributes than necessary to get the desired output.

2.3 Printer Conformance

2.3.1 Formatting/Rendering Rules

A printer *MUST* conform to the XHTML Family User Agent Conformance section of the *Modularization of XHTML* specification ([XHTMLMOD [p.49]], section 3.5) with the following exceptions and additions:

1. Validation is not *REQUIRED* to claim conformance to this standard. A printer *MAY* ignore or otherwise reject a non-conforming XHTML-Print document.
2. Images:
   - If a printer encounters an image in a format it does not support, it *SHALL* render any alternate content provided, and *MAY* reserve the space specified by the height and width attributes by optionally drawing a box around this space of the size specified for the image.
   - If the image format is not supported or the height and width attributes are absent and no alternate content is provided, the image *MAY* be omitted and no space reserved.
   - If the image format is supported and the height and width attributes were omitted, the printer *MAY* choose to omit the image from the page.
   - A printer *MAY* choose to omit images referenced by a URI [RFC2396] [p.50] containing a scheme name other than cid [RFC2392] [p.50] and http [RFC2616] [p.50] .
3. Printers that do not support the xml:lang attribute are not *REQUIRED* to adhere to the rules for language specific whitespace handling.

2.3.2 XHTML Requirements

1. A conforming printer *SHALL* support all XHTML Modules listed in The XHTML-Print Document Type [p.13] .
2. A conforming printer *SHALL* print a static version of a form using default and selected values as specified in the form.
3. Printers supporting inline image data *SHALL* support *RFC3391 - The MIME Application/Vnd.pwg-multiplexed Content-Type* [MIMEMPX [p.50]] as described in Appendix B [p.37] .
4. A conforming printer *SHALL* identify this datastream by the exact string: "XHTML-Print" (without the quotation marks) in all service discovery records and protocols, device identification records and protocols, and in other cases where a list of supported datastreams is to be presented by the printer. Where such datastreams are identified by a MIME media type, the string "application/vnd.pwg-xhtml-print+xml" *SHALL* be used.
5. A conforming printer *SHALL* support the CSS constructs and associated values given in the *CSS Print Profile* [CSSPP [p.49]]; support for other values and other properties or constructs is *OPTIONAL*.

2.4. Enhanced Layout Extension Conformance

To further support print applications requiring more exacting page layout (*e.g.,* photo album pages), the style sheet properties of the Enhanced Layout Extension of the *CSS Print Profile* ([CSSPP [p.49]] section 2.1) and image processing (Appendix A.3 [p.36]) *SHALL* be supported in an *OPTIONAL*, discoverable (via some means outside the scope of this document) Enhanced Layout Extension.

The following is an informative example using absolute positioning with image data:

```
<style type="text/css">
.picture1 {
    position: absolute;
    top: 25mm;
    left: 25mm;
    padding-top: 10mm;
    width: 30mm;
    height: 30mm;
    clip: rect(10mm, 30mm, 30mm, 0mm)
        }
</style>
. . .
<div class="picture1">
<img src="some_file.jpg" alt="..." />
</div>
```

3. The XHTML-Print Document Type

The XHTML-Print document type is defined as a set of XHTML modules. All XHTML modules are defined in the *Modularization of XHTML* specification [XHTMLMOD [p.49]].

XHTML-Print consists of the following XHTML modules:

Structure Module*
`body, head, html, title`
Text Module*
`abbr, acronym, address, blockquote, br, cite, code, dfn, div, em, h1, h2, h3, h4, h5, h6, kbd, p, pre, q, samp, span, strong, var`
Hypertext Module*
`a`
List Module*
`dl, dt, dd, ol, ul, li`
Text Extension Module - Presentation**
`b, big, hr, i, small, sub, sup, tt`
Basic Forms Module
`form, input, label, select, option, textarea`
Basic Tables Module
`caption, table, td, th, tr`
Image Module
`img`
Object Module
`object, param`
Metainformation Module
`meta`
Scripting Module**
`noscript`, `script`
Style Sheet Module**
`style`
Style Attribute Module**
`style` attribute
Link Module
`link`
Base Module
`base`

(*) = This module is a REQUIRED *XHTML Host Language module.*
(**) = These modules are not a part of XHTML Basic but are REQUIRED *for XHTML-Print.*

An XML 1.0 DTD is available in Appendix C. [p.41]

3.1 Attributes and Attribute Collections

Some of the attributes defined in the *Modularization of XHTML* [XHTMLMOD [p.49]] are not applicable to the printed page or are not relevant due to the exclusion of their module from XHTML-Print. Other attributes have equivalent CSS properties that when present take precedence over the attribute. Other attributes are not *REQUIRED* but if supported by a printer, support *SHOULD* be provided in the *RECOMMENDED* manner.

Each attribute in the following sections is annotated to indicate the processing *REQUIRED* of a conforming printer:

Key	Description
MUST	Support is mandatory; a conforming printer *MUST* implement this attribute
SHOULD	The attribute is concerned with functionality that *SHOULD* be implemented but *MAY* be beyond the capability of a conforming printer. For example, a monochrome printer can only render a gray scale equivalent of color images. A conforming printer *MUST* not treat this attribute as an error.
MAY	The attribute's functionality is considered too complex, either in processing or memory requirements, for a conforming printer. For example, determining vertical alignment within the cells of a row that spans multiple pages could exceed a low cost printer's available memory, therefore, it is not *REQUIRED* of a conforming printer. A conforming printer *MUST NOT* treat this attribute as an error.
N/A	The attribute does Not Apply to the printed page; a conforming printer *MAY* ignore this attribute for one of the following reasons, but cannot treat it as an error: • The attribute applies to a user interface which is not represented on a printed page. For example, the accesskey attribute is irrelevant. • The attribute applies to form submission which is not performed by the printer, the method attribute of the form element for example, • The attribute, such as title, describes data which is not represented on a printed page • The attribute applies to objects other than JPEG images, such as Java applets. • The attribute does not apply since links specified by the anchor element are not followed.

The *Modularization of XHTML* ([XHTMLMOD [p.49]], section 5.1) contains a set of attribute collections for ease of presentation. This specification continues this practice with the same conditions, that is, that the collections below are informative and their contents normative.

Collection Name	Attributes in Collection	*REQUIRED* Processing
Core	class (NMTOKENS† [p.15])	*MUST* [p.14]
Core	id (ID† [p.15])	*MUST* [p.14]
Core	title (CDATA† [p.15])	N/A [p.14]
I18N	xml:lang (NMTOKEN† [p.15])	*MAY* [p.14]
Style	style (CDATA† [p.15])	*SHOULD* [p.14]
Common	Core [p.15] + I18N [p.15] + Style [p.15]	See Collections

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

Note that the title attribute of the Core collection is not applicable to the printed page since there is no place to display such supplementary information.

A printer *MAY* support special processing based on the natural language of the document, such as the use of guillemots for quotation marks in French text. If a printer implements processing based on the natural language of the document, that processing *SHALL* be controlled by ththe xml:lang attribute.

A printer *SHOULD* support CSS style sheets, as noted in section 1.3.2 Presentation [p.6] , within the limits of its capabilities.

3.2 Structure Module

Elements	Attributes	*REQUIRED* Processing
body	Common [p.15]	See Collection
head	I18N [p.15] ,	See Collection
head	profile (URI† [p.16])	*MAY* [p.14]
html	I18N [p.15] ,	See Collection
html	version (CDATA† [p.16]),	N/A [p.14]
html	xmlns (URI† [p.16] = "http://www.w3.org/1999/xhtml")	*MUST* [p.14]
title	I18N [p.15]	See Collection

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

If the printer implements support for meta data then it *MUST* support the profile attribute of the head element.

The version attribute is not applicable for printing since it was deprecated in the *HTML 4.01 Specification* [HTML4 [p.49]] in favor of version information within the DTD.

A printer can ignore the content of the title element since it is not part of the document's body.

3.3 Text Module

Elements	Attributes	***REQUIRED*** **Processing**
abbr, acronym, address	Common [p.15]	See Collection
blockquote	Common [p.15] ,	See Collection
blockquote	cite (URI† [p.16])	N/A [p.14]
br	Core [p.15]	See Collection
cite, code, dfn, div, em, h1, h2, h3, h4, h5, h6, kbd, p	Common [p.15]	See Collection
pre	Common [p.15] ,	See Collection
pre	xml:space="preserve"	*MUST* [p.14]
q	Common [p.15] ,	See Collection
q	cite (URI† [p.16])	N/A [p.14]
samp, span, strong, var	Common [p.15]	See Collection

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

xml:space="preserve" is the default for all elements in XHTML, and is a mechanism for specifying that space is preserved on input of the document. To specify that space is also preserved on output, the CSS property 'whitespace' is used. In the absence of any CSS rules to the contrary, the `<pre>` element *MUST* be rendered as if it has a value for the CSS whitespace property of 'pre'.

3.4 Hypertext Module

Element	Attributes	*REQUIRED* Processing
a	Common [p.15] ,	See Collection
a	accesskey (Character† [p.17]),	N/A [p.14]
a	charset (Charset† [p.17]),	N/A [p.14]
a	href (URI† [p.17]),	N/A [p.14]
a	hreflang (LanguageCode† [p.17]),	N/A [p.14]
a	rel (LinkTypes† [p.17]),	N/A [p.14]
a	rev (LinkTypes† [p.17]),	N/A [p.14]
a	tabindex (Number† [p.17]),	N/A [p.14]
a	type (ContentType† [p.17])	N/A [p.14]

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

3.5 List Module

Elements	Attributes	*REQUIRED* Processing
dl, dt, dd, ol, ul, li	Common [p.15]	See Collection

3.6 Presentation Module

Elements	Attributes	*REQUIRED* Processing
b, big, hr, i, small, sub, sup, tt	Common [p.15]	See Collection

3.7 Basic Forms Module

Elements	Attributes	*REQUIRED* Processing
form	Common [p.15] ,	See Collection
form	action* [p.19] (URI† [p.19]),	N/A [p.14]
form	method ("get"** [p.19] | "post"),	N/A [p.14]

Elements	Attributes	*REQUIRED* Processing
form	enctype (ContentType† [p.19])	N/A [p.14]
input	Common [p.15] ,	See Collection
input	accesskey (Character† [p.19]),	N/A [p.14]
input	checked ("checked"),	*MUST* [p.14]
input	maxlength (Number† [p.19]),	N/A [p.14]
input	name (CDATA† [p.19]),	N/A [p.14]
input	size (Number† [p.19]),	*MUST* [p.14]
input	src (URI† [p.19]),	N/A [p.14]
input	tabindex (Number† [p.19]),	N/A [p.14]
input	type("text"** [p.19])	*MUST* [p.14]
input	type("password")	*MUST* [p.14]
input	type("checkbox")	*MUST* [p.14]
input	type("radio")	*MUST* [p.14]
input	type("submit")	*MUST* [p.14]
input	type("reset")	*MUST* [p.14]
input	type("hidden")	*MUST* [p.14]
input	value (CDATA† [p.19])	*MUST* [p.14]
label	Common [p.15] ,	See Collection
label	accesskey (Character† [p.19]),	N/A [p.14]
label	for (IDREF† [p.19])	N/A [p.14]
select	Common [p.15] ,	See Collection
select	multiple ("multiple"),	N/A [p.14]
select	name (CDATA† [p.19]),	N/A [p.14]
select	size (Number† [p.19]),	*MUST* [p.14]
select	tabindex (Number† [p.19])	N/A [p.14]
option	Common [p.15] ,	See Collection
option	selected ("selected"),	*MUST* [p.14]

Elements	Attributes	*REQUIRED* Processing
option	value (CDATA† [p.19])	*MUST* [p.14]
textarea	Common [p.15] ,	See Collection
textarea	accesskey (Character† [p.19]),	N/A [p.14]
textarea	cols* [p.19] (Number† [p.19]),	*MUST* [p.14]
textarea	name (CDATA† [p.19]),	N/A [p.14]
textarea	rows* [p.19] (Number† [p.19]),	*MUST* [p.14]
textarea	tabindex (Number† [p.19])	N/A [p.14]

Table Notes:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

* The attribute *MUST* be present.

** The value is the default.

The src attribute of the `<input>` element is not supported since the 'image' type is not part of basic forms.

The 'hidden' type for the `<input>` element *MUST* be supported even though nothing is printed, so that a printer can correctly recognize and ignore the element.

3.8 Basic Tables Module

Elements	Attributes	*REQUIRED* Processing
caption	Common [p.15]	See Collection
table	Common, [p.15]	See Collection
table	summary (Text† [p.20])	N/A [p.14]
td, th	Common [p.15] ,	See Collection
td, th	abbr (Text† [p.20]),	*MAY* [p.14]
td, th	align ("left" | "center" | "right"),	*MUST* [p.14]
td, th	axis (CDATA† [p.20]),	N/A [p.14]
td, th	colspan (Number† [p.20]),	*MUST* [p.14]
td, th	headers (IDREFS† [p.20]),	N/A [p.14]
td, th	rowspan (Number† [p.20]),	*MUST* [p.14]
td, th	scope ("row" | "col"),	N/A [p.14]
td, th	valign ("top" | "middle" | "bottom")	*MUST* [p.14]
tr	Common [p.15] ,	See Collection
tr	align ("left" | "center" | "right"),	*MUST* [p.14]
tr	valign ("top" | "middle" | "bottom")	*MUST* [p.14]

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

If a printer implements a feature to truncate the contents of a cell because of space constraints, it *MUST* support the abbr attribute and print the value of the abbr attribute (if present) instead of the cell's content.

A printer *MUST* support the values "left," "right," and "center" for the align attribute of the td, th, and tr elements, other values are *OPTIONAL*. If the align attribute is missing or has an unsupported value a printer *MUST* act as if the align attribute has the value "left."

A printer *MUST* support the values "top," "middle," and "bottom" for the valign attribute of the td, th, and tr elements, other values are *OPTIONAL*. If the valign attribute is missing or has unrecognized value, a printer *SHOULD* act as if the valign attribute has the value "middle." Vertical alignment is undefined across page boundaries.

3.9 Image Module

Elements	Attributes	*REQUIRED* Processing
img	Common [p.15] ,	See Collection
img	alt* [p.21] (Text† [p.21]),	*MUST* [p.14]
img	height (Length† [p.21]),	*MUST* [p.14]
img	longdesc (URI† [p.21]),	N/A [p.14]
img	src* [p.21] (URI† [p.21]),	*MUST* [p.14]
img	width (Length† [p.21])	*MUST* [p.14]

Table Notes:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

* The attribute *MUST* be present.

Printers *MUST* support the cid [RFC2392] [p.50] and http [RFC2616] [p.50] schemes of a URI [RFC2396] [p.50] , support for other schemes is *OPTIONAL*.

Conforming documents *SHOULD* specify the width and height of the image using the width and height attributes, since some printers *MAY* ignore such images. (2.3.1 Formatting/Rendering Rules [p.9]).

3.10 Object Module

Elements	Attributes	*REQUIRED* Processing
object	Common [p.15] ,	See Collections
object	archive (URIs† [p.22]),	N/A [p.14]
object	classid (URI† [p.22]),	N/A [p.14]
object	codebase (URI† [p.22]),	*MUST* [p.14]
object	codetype (ContentType† [p.22]),	N/A [p.14]
object	data (URI† [p.22]),	*MUST* [p.14]
object	declare ("declare"),	*MAY* [p.14]
object	height (Length† [p.22]),	*MUST* [p.14]
object	name (CDATA† [p.22]),	N/A [p.14]
object	standby (Text† [p.22]),	N/A [p.14]
object	tabindex (Number† [p.22]),	N/A [p.14]
object	type ("image/jpeg"),	*MUST* [p.14]
object	width (Length† [p.22])	*MUST* [p.14]
param	id (ID† [p.22]),	N/A [p.14]
param	name* [p.22] (CDATA† [p.22]),	N/A [p.14]
param	type (ContentType† [p.22]),	N/A [p.14]
param	value (CDATA† [p.22]),	N/A [p.14]
param	valuetype ("data"** [p.22] | "ref" | "object")	N/A [p.14]

Table Notes:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

* The attribute *MUST* be present.

** The value is the default.

Printers *MUST* support the cid [RFC2392] [p.50] and http [RFC2616] [p.50] schemes of a URI [RFC2396] [p.50] , support for other schemes is *OPTIONAL*.

A printer *MAY* support inline image data as described in B.3 Using object for In-line Image Data [p.38] . If it does, then the declare attribute of the object element *MUST* be supported.

A printer *MUST* treat the object as a jpeg image when the value of the object element's type attribute is "text/jpeg." A printer *MAY* support other types of image formats and therefore other values of the type attribute. A printer *MUST* process the content of the object element when it does not recognize or support the object type referenced by the value of the type attribute. What processing occurs in this situation is implementation dependent

Conforming documents *SHOULD* specify the width and height of the image using the width and height attributes, since some printers *MAY* ignore such images. (2.3.1 Formatting/Rendering Rules [p.9]).

The param element's purpose is to pass data to an application specified in the enclosing object element. Since only images, which do not need initialization, are supported in the object element, the param element can be completely ignored.

3.11 Metainformation Module

Elements	Attributes	*REQUIRED* Processing
meta	I18N [p.15] ,	See Collection
meta	content* [p.23] (CDATA† [p.23]),	N/A [p.14]
meta	http-equiv (NMTOKEN† [p.23]),	N/A [p.14]
meta	name (NMTOKEN† [p.23]),	N/A [p.14]
meta	scheme (CDATA† [p.23])	N/A [p.14]

Table Notes:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

* The attribute *MUST* be present.

A printer *MAY* implement support for this element and provide implementation specific processing of the meta-information. However, guidelines and/or recommendations for processing a document's meta-information are beyond the scope of this document.

3.12 Scripting Module

Elements	Attributes	*REQUIRED* Processing
noscript	Common [p.15] ,	See Collections
script	charset (Charset),	N/A [p.14]
script	defer ("defer"),	N/A [p.14]
script	src(URI),	N/A [p.14]
script	type (ContentType),	N/A [p.14]
script	scheme (CDATA)	N/A [p.14]

Scripts, as programs that are executed in conjunction with a document, are not relevant to the printed page and *SHOULD NOT* be printed. The noscript element contains alternate content that *MUST* be printed in place of the content of the script element.

3.13 Style Sheet Module

Elements	Attributes	*REQUIRED* Processing
style	I18N [p.15] ,	See Collection
style	media (MediaDesc† [p.24]),	*SHOULD* [p.14]
style	title (Text† [p.24]),	N/A [p.14]
style	type* [p.24] ("type/css"),	*SHOULD* [p.14]
style	xml:space="preserve"	*SHOULD* [p.14]

Table Notes:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

* The attribute *MUST* be present.

A printer *MUST* read and process the content of style elements where the media attribute has the value "print" or "all." A printer *MAY* read and process the content of style elements where the media attribute has the value "projection". A printer *SHOULD* ignore the content of style elements where the media attribute has any other value. The absence of the media attribute *MUST* be treat as if the media attribute had the value "screen."

A printer *MUST* read and process the content of style elements where the value of the type attribute is "text/css," all other values *MUST* cause the content to be ignored. Style elements without a type attribute will be treated in an implementation dependent manner.

3.14 Style Sheet Attribute Module

This module adds the style attribute to the Common [p.15] attribute collection (section 3.1).

3.15 Link Module

Elements	Attributes	*REQUIRED* Processing
link	Common [p.15] ,	See Collection
link	charset (Charset† [p.25]),	*MUST* [p.14]
link	href (URI† [p.25]),	*MUST* [p.14]
link	hreflang (LanguageCode† [p.25]),	*MAY* [p.14]
link	media (MediaDesc† [p.25]),	*MUST* [p.14]
link	rel ("stylesheet"),	*MUST* [p.14]
link	rev (LinkTypes† [p.25]),	N/A [p.14]
link	type ("text/css")	*MUST* [p.14]

Table Note:

† See *Modularization of XHTML* ([XHTMLMOD [p.49]], section 4.3)

Printers *MUST* support the cid [RFC2392] [p.50] and http [RFC2616] [p.50] schemes of a URI [RFC2396] [p.50] , support for other schemes is *OPTIONAL*.

If the printer implements processing based on the natural language of the document, then the hreflang attribute *MUST* be supported.

A printer *MUST* read and process the content of external style sheets where the media attribute has the value "print" or "all." A printer *MAY* read and process the content of external style sheets where the media attribute has the value "projection". A printer *SHOULD* ignore the content of external style sheets where the media attribute has any other value. The absence of the media attribute *MUST* be treat as if the media attribute had the value "screen."

A printer *SHOULD* support the value "stylesheet" for the rel attribute along with the value "text/css" for the type attribute, all other values are *OPTIONAL*.

3.16 Base Module

Elements	Attributes	*REQUIRED* Processing
base	href* [p.26] (URI† [p.26])	*MUST* [p.14]

Table Notes:

† See *Modularization of XHTML*([XHTMLMOD [p.49]], section 4. 3

* The attribute *MUST* be present.

Printers *MUST* support the cid [RFC2392] [p.50] and http [RFC2616] [p.50] schemes of a URI [RFC2396] [p.50] , support for other schemes is *OPTIONAL*.

3.17 Character Entities

XHTML-Print is in the family of XHTML document types, since it is created by combining XHTML modules. The character entities that are part of XHTML-Print are, therefore, defined in XHTML Character Entities ([XHTMLMOD [p.49]], Section F.1).

4. How to Use XHTML-Print

XHTML-Print inherits all the structure, encoding and other basic infrastructure specified by *XHTML 1.0* [XHTML1 [p.49]]. The following sections describe and clarify the application and usage restrictions of XHTML-Print.

4.1 *RECOMMENDED* Attributes on the "img" and "object" Elements

Because many printers create the page in a serial manner from top to bottom, it is important for the printer to know the size of images before retrieving the image data itself. This information is then used to create portions of the page layout.

Therefore, the sender *SHOULD* include the height and width attributes within the `img` or the `object` element. Printers *MAY* omit from the page images that do not include height and width attributes (see item 2, Images [p.10] , of section 2.3.1). These attributes *MAY* be expressed as pixels or percentages within the `img` or the `object` element. Percentages are relative to the parent element and not the page width or printable area.

This document specifies only one mandatory image format: baseline JPEG as defined in *JPEG File Interchange Format* [JPEG [p.50]]. See Appendix A [p.35] for a description of JPEG decoder requirements. Printers are not *REQUIRED* to support:

- Embedded thumbnails
- Rotation
- Progressive rendering

within the JFIF and EXIF files.

4.2 Style Sheets

Conforming XHTML-Print printers *SHALL* support both in-line and referenced style sheets within the `style` element or `link` element in the `head` element of a document. Conforming XHTML-Print printers *SHALL* also support the style attribute (i.e. in-line style) when used within other elements as defined by *XHTML 1.1*[XHTML1.1 [p.49]]. Normal cascading rules apply.

4.3 Image Data

In traditional Web-based applications of XHTML, image data is contained in a separate file on a Web server that the user agent retrieves.

However, there are circumstances where it is desirable to include the image data along with the rest of the print data. For example, some low cost, resource constrained clients *MAY* want to include images in their print output but cannot afford to include a server. Furthermore, some printers *MAY* require that all the print data be encapsulated in a single file for transportability,

avoiding firewall issues, etc. Therefore, conforming XHTML-Print printers *MUST* support two document formats: a format that contains both a document and its referenced image data and the traditional format that contains only the document.

[Informative] Furthermore, both formats *MUST* be supported since there is no guaranteed mechanism for the printer to advertise the formats it supports. Lacking the ability to determine a printer's support for one or both formats a sending application *MUST* be able to depend on support for both formats so that it can chose the format that is best for its circumstances. [ed.]

See Appendix B [p.37] for discussion of the method that *SHALL* be used to collect both XHTML-Print and associated image data into a single file or data stream.

4.4 Side-by-Side Images

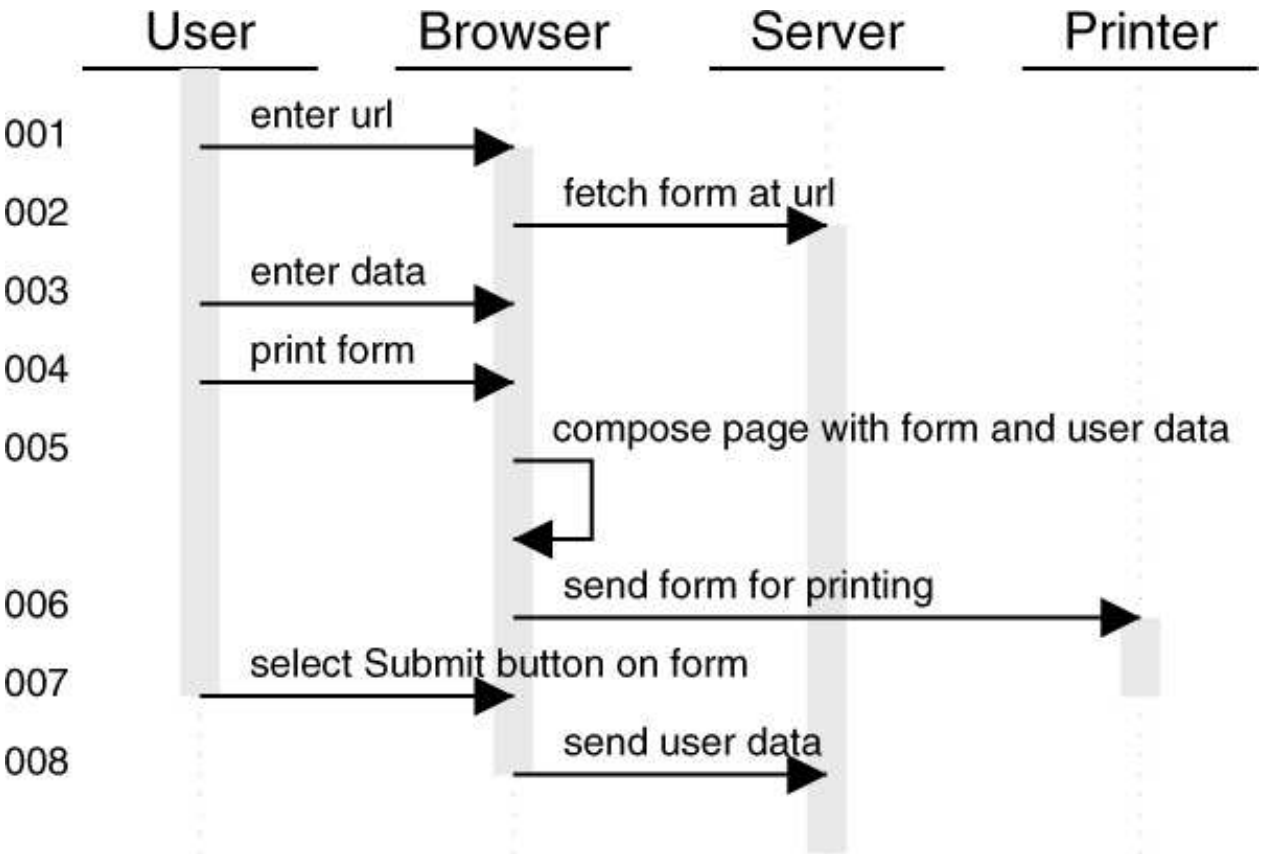
Low-cost printers today often have very little memory into which page data can be stored before being printed. As such, they *MAY* build and print the page in swaths on the fly from the top of the page to the bottom. To enable the use of XHTML-Print in these low cost printers, some restrictions on the order of images contained in the XHTML-Print data stream *MUST* be added.

1. If two or more images will be even partially side-by-side on the printed page they *SHOULD* be included by reference, for example `<img src="http://example.com/example.jpg">`, or by means of a data interleaving scheme such as described in B.2.1 Interleaving Images [p.38] . (See Appendix B) [p.37] . This allows the printer to get chunks of the image, as it needs it, as it prints down the page. If images are included inline, the methods and techniques of Appendix B.2 [p.37] are *REQUIRED* and the method discussed in Appendix B.3 [p.38] is discouraged.
2. An XHTML-Print conforming printer lacking sufficient buffer space to hold multiple side-by-side images *MAY* choose to reformat the layout of the page to preserve content. Printers *SHALL* attempt to preserve content when encountering side-by-side images that *MAY* be impossible to print as specified within the XHTML-Print. Discarding the second and subsequent of the side-by-side images *SHOULD* be avoided unless preservation of content is best achieved by doing so. Other than attempting to best preserve content, this specification does not mandate any specific behavior when encountering this situation. Clients providing images inline *SHOULD* order them from left-to-right top-to-bottom unless the print direction is known to be otherwise.

4.5 Forms Usage

An HTML form is a dynamic entity when the document is displayed in a browser : data can be entered into text fields, buttons *MAY* be pushed, selections made, and options checked. None of this dynamic activity can be rendered on a printed page. However, a printed page can permanently record a particular state of the form. For example, users *MAY* wish to print forms that record products ordered or payments made.

The following discussion illustrates the activity involved when interacting with and printing forms. Please refer to Sequence Diagram 1 [p.29]



Sequence Diagram 1. Forms Usage

Steps:

1. The User enters a URL into the Browser
2. The Browser fetches the form from the Server and displays it
3. The User enters data into the form
4. The User asks the Browser to print the form
5. The Browser composes a page with the form and the user data
6. The Browser sends the new composed form to the printer
7. The User selects the Submit button on the form
8. The Browser sends the user data to the Server

Detailed discussion of Steps:

1. The user interacts with a browser on a mobile device to access a form presented by a server on the network (lines 1 and 2 of Sequence Diagram 1 [p.29]). The following fragment of an XHTML-Print document shows what the server sends to the browser to present to the user. Please note, that the form is blank when first presented to the user.
<form action="http://example.com/prog/adduser" method="post">

```
<label for="firstname">First name: </label>
<input type="text" id="firstname" /><br />
<label for="lastname">Last name: </label>
<input type="text" id="lastname" /><br />
<label for="email">email: </label>
<input type="text" id="email" size="40" /><br />
<input type="checkbox" name="member" value="IEEE" /> IEEE <br />
<input type="checkbox" name="member" value="ACM" /> ACM <br />
<input type="submit" value="Send" /> <input type="reset" />
</form>
```

Here is an example presentation of the above form as the user would see it:

First name:

Last name:

email:

☐ IEEE
☐ ACM

2. The user enters data (line 3 of Sequence Diagram 1 [p.29]) into the text fields and checks the IEEE check box so that the form now looks like the following:

First name:

Last name:

email:

☐ IEEE
☐ ACM

3. The user then clicks on the browser's print button (line 4 of Sequence Diagram 1 [p.29]), to print the form as it currently appears.
4. The browser then creates a, possibly new, document (line 5 of Sequence Diagram 1 [p.29]) containing the original form and the users data. Note in the XHTML-Print document below, created by the browser, that the user's data is include either by a value attribute or a checked attribute.

```
<form action="http://example.com/prog/adduser" method="post">
<label for="firstname">First name: </label>
<input type="text" id="firstname" value="John"/><br />
<label for="lastname">Last name: </label>
<input type="text" id="lastname" value="Doe"/><br />
<label for="email">email: </label>
```

<input type="text" id="email" value="johnd@>example.org" />
<input type="checkbox" name="member" checked="checked" value="IEEE" /> IEEE
<input type="checkbox" name="member" value="ACM" /> ACM
<input type="submit" value="Send" /> <input type="reset" />
</form>

5. The browser sends (line 6 of Sequence Diagram 1 [p.29]) the document created in line 5 to the printer.
6. Sometime later the user clicks on the submit form button (line 7 of Sequence Diagram 1 [p.29]) and the browser submits the form (line 8 of Sequence Diagram 1 [p.29]) using the procedures given in the *HTML 4.01 Specification* ([HTML4 [p.49]], Forms Submission).

5. Acknowledgements

This section is informative.

This specification is based, almost exclusively, on the specification of the same name, *XHTML™-Print* [XHTMLPRINT [p.51]], from the Printer Working Group, a program of and through the IEEE Industry Standards and Technology Organization, Inc., and the editor wishes to express his gratitude to all of those who contributed to it.

A. JPEG Decoder Requirements

A.1 Introduction

A.1.1 Intent

This appendix describes *RECOMMENDED* behaviors for JPEG decoders in XHTML-Print devices. Behaviors for both minimal printers and enhanced layout printers are described. Many of the behaviors described in this document follow directly from language already present in the relevant JPEG standards, but are repeated here to emphasize their importance.

A.1.2 Objectives

The decoder behaviors described in this document are intended to minimize implementation complexity, while retaining maximum compatibility with existing JPEG files. In particular, these recommendations seek to ensure compatibility with both EXIF and baseline JFIF (i.e. the subset of JFIF files that use only baseline JPEG processes). Support for JPEG streams using non-baseline processes, such as arithmetic coding or progressive coding, is not mandated for XHTML-Print compliance.

A.2 Behaviors of Minimal Printers

This section describes behaviors of JPEG decoders for minimal XHTML-Print implementations.

A.2.1 JPEG Processes

A JPEG decoder for an XHTML-Print printer *SHALL* support all baseline JPEG processes as defined in [CCITT [p.50]], except for 2- and 4-component images. These processes include grayscale and 3-component images, 8-bit/component sample depth, Huffman entropy coding, 444, 422, 411, and 400 subsampling modes, and sequential (i.e. non-progressive) scan.

A.2.2 Handling of APPx Markers

Baseline decoders *MAY* ignore application-specific markers, such as the JFIF APP0 marker and the EXIF APP1/APP2 markers. This will cause all images to print in an un-rotated orientation, with image size as specified in the JPEG SOF marker if not overridden by XHTML-Print mark-up. A JPEG decoder for a minimal printer *SHALL NOT* fail as a consequence of encountering an unsupported APPx marker (i.e. all such markers *SHALL* be correctly parsed, even if they are ignored).

A.2.3 Color Management

This section describes a *RECOMMENDED* color management approach for minimal XHTML-Print printers.

Grayscale Images

Sample values in a grayscale (single-component) JPEG image *SHALL* be converted to the sRGB color space by setting

$$R_{out} = G_{out} = B_{out} = Gray_{in}$$

Color Images

Sample values in 3-component JPEG images *SHALL* be interpreted as YCbCr samples, as would be obtained by applying the matrices described in ITU BT.601 **[BT601.5 [p.51]]** to sRGB input data.

A.3 JPEG Decoder for XHTML-Print Enhanced Layout Extension

This section describes behaviors of JPEG decoders for XHTML-Print devices that support the XHTML-Print Enhanced Layout Extension, an *OPTIONAL* feature block. The behaviors described below *SHOULD* be interpreted as "in addition to" those described in XHTML-Print Document Type [p.13] and Printer Conformance [p.9] (the requirements for minimal XHTML-Print devices).

A.3.1 Handling of EXIF APP1 and APP2 Markers

A JPEG decoder for an XHTML-Print implementation which supports the Enhanced Layout Extension *MAY* decode the TIFF IFDs embedded in the EXIF APP1 and APP2 markers, as described in Section 2.6.4 of [JEIDA [p.50]]. The following IFDs *MAY* be supported. However, any future XHTML elements or CSS properties affecting image orientation *SHALL* take precedence over these IFDs.

Tag Name	Field Name	Description
Orientation of Image	Orientation	Sets image orientation in 90-degree increments, and enables transposition.

B. Inline Image Data

B.1 Introduction

B.1.1 Intent

The intent of this appendix is to describe the method for including XHTML-Print and associated image data in a single data stream or file. Support for Inline Image Data is *REQUIRED*. (See Image Data [p.27] .)

In addition to images, if separate style sheets are to be interleaved with the XHTML-Print data, the same method *SHALL* be used.

B.1.2 Objectives

- Minimize image data size
- No or minimal additional encoding / decoding of image data *REQUIRED*
- Enable juxtaposition between image data and associated XHTML-Print content
- Many printers are unable to buffer significant amounts of page content data, so the image data is printed more or less as it is received. This implies the image data *SHALL* be sent near the related XHTML-Print content, so that layout and printing can occur without extensive data buffering.
- Minimize complexity
- Leverage existing standard capabilities

B.2 MIME type Application/Multiplexed

This section includes by reference the entirety of "RFC3391 - The MIME Application/Multiplexed Content-type", Robert Herriot [MIMEMPX [p.50]]. All printers *MUST* support inline data using RFC3391[MIMEMPX] [p.50] .

Producers and consumers of Application/Vnd.pwg-multiplexed entities (compound documents), as defined in [MIMEMPX [p.50]], *SHOULD* consider each component image message of the compound document as having one and only one reference. The producer of the compound document *MUST* assume that the consumer of the compound document has limited memory and therefore include a unique image message for each image reference found in the root document. If a ContentID is present in the header of an image message, that ContentID *MUST* be unique. If a Content-Location is present in the header of an image message, that Content-Location is *REQUIRED* to be unique except for the special case where a repeated reference to the same image URL causes several messages containing the same image data to be present in the compound document. Consumers *MAY* release the message data associated with an image reference as the image is rendered, because the Consumer can be confident that another reference to the same image will be accompanied by another message containing the image data. Consumers *MAY* also substitute image data for a message with a given Content-Location header value with image data from other messages with the same

Content-Location header value because Consumers can be confident that messages with identical Content-Location values do in fact contain identical data.

URL references in the root document of the multiplexed document *MUST* be matched to Content-Location and/or Content-ID fields of the referenced message object according to the rules given by [RFC2557] [p.51] . An exception to the rules given by [RFC2557] [p.51] occurs when a reference is made to a message object named with a Content-Location. In that special case, multiple instances of that message are *REQUIRED* in the compound document.

B.2.1 Interleaving Images

This section is informative.

RFC3391[MIMEMPX [p.50]] only says that an image *SHOULD* be placed close to its reference in a compound document. However, if an image is placed directly after its reference, the information in the image header is available, when needed, for determining the size of the image's box. Furthermore, the printer will immediately know if the image is present or if its alternate content *MUST* be printed. On the other hand, when several images will be placed on a page, some low-cost printers *MAY* not have enough memory to hold the images in memory while rendering the page. One possible solution to this dilemma is to break each image into chunks, and to place each image's header in its own chunk near the image's reference. The remainder of the chunks for each image are placed later in the compound document and *MAY* be interleaved to further reduce the memory needed to store the images while printing.

B.3 Using object for In-Line Image Data

This section is informative.

An alternative method to include inline image data in XHTML-Print is via the `object` element and a forward reference. The declare attribute of the `object` element is used to define the object, but delay its processing. The id attribute is used to associate the forward reference with the image content, sent at the end of the XHTML-Print document. Because this method normally encodes the binary image data using base64 encoding, a significant increase in the size of the data transmitted will be experienced. This *SHOULD* be avoided over low speed connections. Printers supporting inline data *MAY* support base64 encoding using `object`.

See RFC2397 [p.50] for information on the "data" URL scheme.

```
<object declare="declare"
  height="20 mm" width="20 mm"
  type="image/jpeg"
  id="image_1" >
</object>
. . . .
<object id="image_1"
  data=" . . . ">
</object>
```

This method *MAY* be useful for very simple clients that cannot afford a server for image download or for some reason cannot utilize the Application/Multiplexed MIME type; however, it is not *RECOMMENDED* for general use especially if the size of the printer's buffer is unknown.

C. XHTML-Print DTD and Modules

This section contains the pieces of the XHTML-Print DTD that are unique to XHTML-Print. The remaining entities and modules are as specified in reference [XHTMLMOD [p.49]].

The following *SHOULD* be used from Modularization of XHTML [XHTMLMOD [p.49]]:

1. xhtml-attribs-1.mod
2. xhtml-base-1.mod
3. xhtml-basic-form-1.mod
4. xhtml-basic-table-1.mod
5. xhtml-blkphras-1.mod
6. xhtml-blkpres-1.mod
7. xhtml-blkstruct-1.mod
8. xhtml-charent-1.mod
9. xhtml-datatypes-1.mod
10. xhtml-framework-1.mod
11. xhtml-hypertext-1.mod
12. xhtml-image-1.mod
13. xhtml-inlphras-1.mod
14. xhtml-inlpres-1.mod
15. xhtml-inlstruct-1.mod
16. xhtml-inlstyle-1.mod
17. xhtml-lat1.ent
18. xhtml-link-1.mod
19. xhtml-list-1.mod
20. xhtml-meta-1.mod
21. xhtml-notations-1.mod
22. xhtml-object-1.mod
23. xhtml-param-1.mod
24. xhtml-pres-1.mod
25. xhtml-qname-1.mod
26. xhtml-special.ent
27. xhtml-struct-1.mod
28. xhtml-style-1.mod
29. xhtml-symbol.ent
30. xhtml-text-1.mod

C.1. XHTML-Print 1.0 DTD

Available for download at xhtml-print10.dtd.

```
<!-- ..................................................................... -->
<!-- XHTML-Print 1.0 DTD ................................................. -->
<!-- file: xhtml-print10.dtd
-->

<!-- XHTML-Print 1.0 DTD

     This is XHTML-Print 1.0, a variant of XHTML Basic for printing.

     Copyright 1998-2003 World Wide Web Consortium
        (Massachusetts Institute of Technology, European Research
         Consortium for Informatics and Mathematics, Keio University).
         All Rights Reserved.

     Permission to use, copy, modify and distribute the XHTML-Print DTD and
     its accompanying documentation for any purpose and without fee is hereby
     granted in perpetuity, provided that the above copyright notice and
     this paragraph appear in all copies.  The copyright holders make no
     representation about the suitability of the DTD for any purpose.

     It is provided "as is" without expressed or implied warranty.

        Author:   Jun Fujisawa <fujisawa.jun@canon.co.jp>
        Revision: $Id: xhtml-print.ps,v 1.4 2003/07/28 23:57:41 shane Exp $

-->
<!-- This is the driver file for version 1.0 of the XHTML-Print DTD.

     This DTD is identified by the PUBLIC and SYSTEM identifiers:

        PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
        SYSTEM "http://www.w3c.org/MarkUp/DTD/xhtml-print10.dtd"
-->
<!ENTITY % XHTML.version "-//W3C//DTD XHTML-Print 1.0//EN" >

<!-- Use this URI to identify the default namespace:

         "http://www.w3.org/1999/xhtml"
-->
<!ENTITY % NS.prefixed "IGNORE" >
<!ENTITY % XHTML.prefix "" >

<!-- Reserved for use with the XLink namespace:
-->
<!ENTITY % XLINK.xmlns "" >
<!ENTITY % XLINK.xmlns.attrib "" >

<!-- reserved for future use with document profiles -->
<!ENTITY % XHTML.profile "" >

<!-- Bidirectional Text features
     This feature-test entity is used to declare elements
     and attributes used for bidirectional text support.
-->
<!ENTITY % XHTML.bidi "IGNORE" >

<!-- ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: -->
```

```
<!ENTITY % xhtml-events.module "IGNORE" >
<!ENTITY % xhtml-bdo.module "%XHTML.bidi;" >

<!-- Style Attribute Module ............................ -->
<!ENTITY % xhtml-inlstyle.module "INCLUDE" >
<![%xhtml-inlstyle.module;[
<!ENTITY % xhtml-inlstyle.mod
     PUBLIC "-//W3C//ENTITIES XHTML Inline Style 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-inlstyle-1.mod" >
%xhtml-inlstyle.mod;]]>

<!-- Document Model Module ............................. -->
<!ENTITY % xhtml-model.mod
     PUBLIC "-//W3C//ENTITIES XHTML-Print 1.0 Document Model 1.0//EN"
            "xhtml-print10-model-1.mod" >

<!-- Modular Framework Module (required) ............... -->
<!ENTITY % xhtml-framework.mod
     PUBLIC "-//W3C//ENTITIES XHTML Modular Framework 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-framework-1.mod" >
%xhtml-framework.mod;

<!-- Text Module (required) ............................ -->
<!ENTITY % xhtml-text.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Text 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-text-1.mod" >
%xhtml-text.mod;

<!-- Hypertext Module (required) ....................... -->
<!ENTITY % xhtml-hypertext.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Hypertext 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-hypertext-1.mod" >
%xhtml-hypertext.mod;

<!-- Lists Module (required) ........................... -->
<!ENTITY % xhtml-list.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Lists 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-list-1.mod" >
%xhtml-list.mod;

<!-- :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: -->

<!-- Presentation Module ............................... -->
<!ENTITY % xhtml-pres.module "INCLUDE" >
<![%xhtml-pres.module;[
<!ENTITY % xhtml-pres.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Presentation 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-pres-1.mod" >
%xhtml-pres.mod;]]>

<!-- Image Module ..................................... -->
<!ENTITY % xhtml-image.module "INCLUDE" >
<![%xhtml-image.module;[
<!ENTITY % xhtml-image.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Images 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-image-1.mod" >
%xhtml-image.mod;]]>
```

```
<!-- Tables Module ..................................... -->
<!ENTITY % xhtml-table.module "INCLUDE" >
<![%xhtml-table.module;[
<!ENTITY % xhtml-table.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Basic Tables 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-basic-table-1.mod" >
%xhtml-table.mod;]]>

<!-- Forms Module ..................................... -->
<!ENTITY % xhtml-form.module "INCLUDE" >
<![%xhtml-form.module;[
<!ENTITY % xhtml-form.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Basic Forms 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-basic-form-1.mod" >
%xhtml-form.mod;]]>

<!-- Style Sheet Module ............................... -->
<!ENTITY % xhtml-style.module "INCLUDE" >
<![%xhtml-style.module;[
<!ENTITY % xhtml-style.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Style Sheets 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-style-1.mod" >
%xhtml-style.mod;]]>

<!-- Link Module ...................................... -->
<!ENTITY % xhtml-link.module "INCLUDE" >
<![%xhtml-link.module;[
<!ENTITY % xhtml-link.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Link Element 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-link-1.mod" >
%xhtml-link.mod;]]>

<!-- Metainformation Module ........................... -->
<!ENTITY % xhtml-meta.module "INCLUDE" >
<![%xhtml-meta.module;[
<!ENTITY % xhtml-meta.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Metainformation 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-meta-1.mod" >
%xhtml-meta.mod;]]>

<!-- Base Module ...................................... -->
<!ENTITY % xhtml-base.module "INCLUDE" >
<![%xhtml-base.module;[
<!ENTITY % xhtml-base.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Base Element 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-base-1.mod" >
%xhtml-base.mod;]]>

<!-- Param Module ..................................... -->
<!ENTITY % xhtml-param.module "INCLUDE" >
<![%xhtml-param.module;[
<!ENTITY % xhtml-param.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Param Element 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-param-1.mod" >
%xhtml-param.mod;]]>

<!-- Object Module .................................... -->
<!ENTITY % xhtml-object.module "INCLUDE" >
```

```
<![%xhtml-object.module;[
<!ENTITY % xhtml-object.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Embedded Object 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-object-1.mod" >
%xhtml-object.mod;]]>

<!-- Structure Module (required) ....................... -->
<!ENTITY % xhtml-struct.mod
     PUBLIC "-//W3C//ELEMENTS XHTML Document Structure 1.0//EN"
            "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-struct-1.mod" >
%xhtml-struct.mod;

<!-- end of XHTML-Print 1.0 DTD ........................................... -->
<!-- ..................................................................... -->
```

C.2. XHTML-Print 1.0 Document Model Module

Available for download at xhtml-print10-model-1.mod.

```
<!-- ..................................................................... -->
<!-- XHTML-Print 1.0 Document Model Module ................................ -->
<!-- file: xhtml-print10-model-1.mod

     This is XHTML-Print 1.0, a variant of XHTML Basic for printing.
     Copyright 1998-2003 W3C (MIT, ERCIM, Keio), All Rights Reserved.
     Revision: $Id: xhtml-print.ps,v 1.4 2003/07/28 23:57:41 shane Exp $

     This DTD module is identified by the PUBLIC and SYSTEM identifiers:

        PUBLIC "-//W3C//ENTITIES XHTML-Print 1.0 Document Model 1.0//EN"
        SYSTEM "http://www.w3c.org/MarkUp/DTD/xhtml-print10-model-1.mod

     ..................................................................... -->

<!-- XHTML-Print 1.0 Document Model

     This module describes the groupings of elements that make up
     common content models for XHTML-Print elements.
-->

<!-- Optional Elements in head ......................... -->

<!ENTITY % HeadOpts.mix
     "( %meta.qname; | %link.qname; | %object.qname; | %style.qname; )*" >

<!-- Miscellaneous Elements ............................ -->

<!ENTITY % Misc.class "" >

<!-- Inline Elements ................................... -->

<!ENTITY % InlStruct.class "%br.qname; | %span.qname;" >

<!ENTITY % InlPhras.class
     "| %em.qname; | %strong.qname; | %dfn.qname; | %code.qname;
      | %samp.qname; | %kbd.qname; | %var.qname; | %cite.qname;
```

```
      | %abbr.qname; | %acronym.qname; | %q.qname;" >

<!ENTITY % InlPres.class
     "| %tt.qname; | %i.qname; | %b.qname; | %big.qname;
      | %small.qname; | %sub.qname; | %sup.qname; " >

<!ENTITY % I18n.class "" >

<!ENTITY % Anchor.class "| %a.qname;" >

<!ENTITY % InlSpecial.class "| %img.qname; | %object.qname;" >

<!ENTITY % InlForm.class
     "| %input.qname; | %select.qname; | %textarea.qname;
      | %label.qname;"
>

<!ENTITY % Inline.extra "" >

<!ENTITY % Inline.class
     "%InlStruct.class;
      %InlPhras.class;
      %InlPres.class;
      %Anchor.class;
      %InlSpecial.class;
      %InlForm.class;
      %Inline.extra;"
>

<!ENTITY % InlNoAnchor.class
     "%InlStruct.class;
      %InlPhras.class;
      %InlPres.class;
      %InlSpecial.class;
      %InlForm.class;
      %Inline.extra;"
>

<!ENTITY % InlNoAnchor.mix
     "%InlNoAnchor.class;
      %Misc.class;"
>

<!ENTITY % Inline.mix
     "%Inline.class;
      %Misc.class;"
>

<!-- Block Elements ..................................... -->

<!ENTITY % Heading.class
     "%h1.qname; | %h2.qname; | %h3.qname;
      | %h4.qname; | %h5.qname; | %h6.qname;"
>
<!ENTITY % List.class  "%ul.qname; | %ol.qname; | %dl.qname;" >

<!ENTITY % Table.class "| %table.qname;" >
```

```
<!ENTITY % Form.class  "| %form.qname;" >

<!ENTITY % BlkStruct.class "%p.qname; | %div.qname;" >

<!ENTITY % BlkPhras.class
     "| %pre.qname; | %blockquote.qname; | %address.qname;"
>

<!ENTITY % BlkPres.class "| %hr.qname;" >

<!ENTITY % BlkSpecial.class
     "%Table.class;
      %Form.class;"
>

<!ENTITY % Block.extra "" >

<!ENTITY % Block.class
     "%BlkStruct.class;
      %BlkPhras.class;
      %BlkPres.class;
      %BlkSpecial.class;
      %Block.extra;"
>

<!ENTITY % Block.mix
     "%Heading.class;
      | %List.class;
      | %Block.class;
      %Misc.class;"
>

<!-- All Content Elements ............................. -->

<!ENTITY % FlowNoTable.mix
     "%Heading.class;
      | %List.class;
      | %BlkStruct.class;
      %BlkPhras.class;
      %BlkPres.class;
      %Form.class;
      %Block.extra;
      | %Inline.class;
      %Misc.class;"
>

<!ENTITY % Flow.mix
     "%Heading.class;
      | %List.class;
      | %Block.class;
      | %Inline.class;
      %Misc.class;"
>

<!-- end of xhtml-print10-model-1.mod -->
```

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