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The Printer Working Group

XHTML™-Print

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Superseding document: [XHTML-Print](#), available from <http://www.w3.org/TR/xhtml-print/>

Abstract

HTML 4 is a powerful language for authoring Web content, but its design does not take into consideration issues pertinent to printers, including the implementation cost (in power, memory, etc.) of the full feature set. Printers have relatively limited resources that cannot generally afford to implement the full feature set of HTML 4.

Because there are many ways to subset HTML, there are many almost identical subsets defined by organizations and companies. Without a common base set of features, developing print applications for a wide range of printers is difficult.

XHTML-Print's 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.

The document type definition for XHTML-Print is implemented based on the XHTML modules defined in Modularization of XHTML [[XHTMLMOD](#)].

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Members of the PWG and interested parties are encouraged to join the PWG and XHTML-Print WG mailing lists in order to participate in discussions, clarifications and review of the WG product.

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1. Introduction

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 the W3C's XHTML Basic [[XHTMLBASIC](#)] with the addition of cascading style sheets (CSS) [[CSSPP](#)]. 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 may 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 may be required.

XHTML-Print is not appropriate when strict layout consistency and repeatability across printers are required. 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 required. 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](#)] and proposed for CSS3 [[CSS3](#)] as defined in the CSS Print Profile [[CSSPP](#)] 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](#)].

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](#)]. 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.

1.3.1. Script and Events

The `script` and `noscript` elements are not supported as a printer lacks typical user interaction necessary for a script. Content of the script should not be 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 wide variety of fonts other than the generic serif, san 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](#), section 5.4.1 of [[XHTMLMOD](#)] is supported since it allows a very simple user agent to support font variants. The module contains elements that are both structural and presentational, provides the only method for specifying rules (the `hr` element), and allows very simple clients that might not support CSS the means for identifying font variants such as bold, italic, superscript and subscript. Supporting this module allows a client to render these common elements in a manner that is appropriate for its capabilities.

1.3.3. Forms

[Basic XHTML forms](#), section 5.5.1 [[XHTMLMOD](#)] are supported. Content

developers should keep in mind that users may not be able to input many characters from some devices (e.g. from a mobile phone). Note 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](#), section 5.6.1 [[XHTMLMOD](#)] are supported, but tables can be difficult to format on very low resourced devices. Note 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 [[XHTMLMOD](#)]. 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 should a printer wish 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](#) and conform to the constraints expressed in [Design Rationale](#).
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](#) using its Formal

Public Identifier. The system identifier may be modified appropriately.

```
<!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
"http://www.xhtml-print.org/xhtml-print/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/vnd.pwg-xhtml-print+xml". An optional "charset" parameter may be provided with the MIME type. Usage of the optional "charset" parameter is as described in section 3.2 of [\[RFC3023\]](#).

Additionally, printers may support a MIME type of "application/xhtml+xml" with a profile of "<http://www.xhtml-print.org/xhtml-print/xhtml-print10.dtd>". Not all printers will support this option, therefore clients cannot always depend upon it. Use of a profile is as described in section 2 and section 8 of [\[RFC3236\]](#).

2.2. Client Conformance

1. Clients shall produce a well-formed XHTML-Print document as defined in XHTML 1.0 [\[XHTML1\]](#) and in [Document Conformance](#).
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 ([\[XHTMLMOD\]](#), section 3.5) with the following exceptions and additions:

1. Validation is not required to claim conformance to this standard. A printer may flush or otherwise reject a non-conforming XHTML-Print document.
2. Images:
 - i 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.
 - i 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.
 - i 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.

- i Image data within the object element need not be supported.
3. Printers may choose not to render content within elements defined by XHTML [[XHTML1](#)] or HTML [[HTML4](#)] that are obviously not intended to be rendered, e.g. `<script>`.
4. 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](#).
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 [[MIMEMPX](#)] as described in [Appendix B](#).
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](#)]; 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](#)] section 2.1) and image processing ([Appendix A.3](#)) 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>
.picture1 {
    position: absolute;
    top: 25mm;
    left: 25mm;
    padding-top: 10mm;
    width: 30mm;
    height: 30mm;
    clip: rect(10mm, 30mm, 30mm, 0mm)
}
</style>
```

```
. . .  
<div class="picture1">  
  
</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](#)].

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`

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](#).

3.1 Attributes and Attribute Collections

HTML allows binary attributes to be given without a value, e.g. `<option selected>`. However, XML, and hence XHTML 1.0 languages, requires all attributes to take a value. Thus in XHTML-Print these shall be given with a cloned value (e.g. `selected="selected"`).

Some of the attributes defined in [[XHTMLMOD](#)] 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 how it should be treated by a conforming printer:

Key	Description
Yes	Support is mandatory; a conforming printer must honor this attribute;
No	Support is optional; a conforming printer may ignore this attribute for one of the following reasons, but cannot treat it as an error: <ul style="list-style-type: none"> ▫ The attribute applies to a user interface which is not represented on a printed page. ▫ The attribute applies to form submission which is not performed by the printer. ▫ The attribute 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 is part of functionality that is deemed too complex for low cost printers, such as language specific processing, printing on landscape oriented pages, buffering of images for later use, and vertical alignment of cell data in tables that span multiple pages.

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

Collection Name	Attributes in Collection	Support
Core	class (NMTOKENS†)	Yes
	id (ID†)	Yes
	title (CDATA†)	No

I18N	xml:lang (NMTOKEN†)	No
Style	style (CDATA†)	Yes
Common	Core + I18N + Style	See Collection:

Table Note:

† See [XHTMLMOD],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.

Note that support for the xml:lang attribute is optional, if a printer supports special processing based on the spoken language of the document, that processing shall be controlled by this attribute.

3.2 Structure Module

Elements	Attributes	Supp
body	Common	See Colle
head	I18N ,	See Colle
	profile (URI†)	No
html	I18N ,	See Colle
	version (CDATA†),	Yes
	xmlns (URI† = "http://www.w3.org/1999/xhtml")	Yes
title	I18N	See Colle

Table Note:

† See [XHTMLMOD],section 4.3

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

3.3 Text Module

Elements	Attributes	Sup
abbr, acronym, address	Common	See C
blockquote	Common ,	See C
	cite (URI†)	No
br	Core	See C
cite, code, dfn, div, em, h1, h2, h3, h4, h5, h6, kbd, p	Common	See C
pre	Common ,	See C
	xml:space="preserve"	Yes
q	Common ,	See C
	cite (URI†)	No
samp, span, strong, var	Common	See C

Table Note:

† See [XHTMLMOD],section 4.3

The CSS white-space property is preferred over the xml:space attribute, since the attribute is an internal mechanism between the XML processor and the formatting application and doesn't directly control the formatting of the output.

3.4 Hypertext Module

Element	Attributes	Supported
a	<u>Common</u> ,	See Collection
	accesskey (Character†),	<u>No</u>
	charset (Charset†),	<u>No</u>
	href (URI†),	<u>No</u>
	hreflang (LanguageCode†),	<u>No</u>
	rel (LinkTypes†),	<u>No</u>
	rev (LinkTypes†),	<u>No</u>
	tabindex (Number†),	<u>No</u>
	type (ContentType†)	<u>No</u>

Table Note:

3.5 List Module

Elements	Attributes	Supported
dl, dt, dd, ol, ul, li	<u>Common</u>	See Collection

3.6 Presentation Module

Elements	Attributes	Supported
b, big, hr, i, small, sub, sup, tt	<u>Common</u>	See Collection

Table Note:

† See [XHTMLMOD],section 4.3

3.7 Basic Forms Module

Elements	Attributes	Supported
form	<u>Common</u> ,	See Collection
	action* (URI†),	<u>No</u>
	method ("get"* "post"),	<u>No</u>
	enctype (ContentType†)	<u>No</u>
	<u>Common</u> ,	See Collection
	accesskey (Character†),	<u>No</u>
	checked ("checked"),	<u>Yes</u>
	maxlength (Number†),	<u>No</u>

input	name (CDATA†),	No	
	size (Number†),	Yes	
	src (URI†),	No	
	tabindex (Number†),	No	
	type("text" ^{**}	Yes
		"password"	Yes
		"checkbox"	Yes
		"radio"	Yes
		"submit"	Yes
		"reset"	Yes
"hidden")		No	
value (CDATA†)	Yes		
label	Common,	See Collection	
	accesskey (Character†),	No	
	for (IDREF†)	No	
select	Common,	See Collection	
	multiple ("multiple"),	No	
	name (CDATA†),	No	
	size (Number†),	Yes	
	tabindex (Number†)	No	
option	Common,	See Collection	
	selected ("selected"),	Yes	
	value (CDATA†)	Yes	
textarea	Common,	See Collection	
	accesskey (Character†),	No	
	cols [*] (Number†),	Yes	
	name (CDATA†),	No	
	rows [*] (Number†),	Yes	
	tabindex (Number†)	No	

Table Notes:

† See [XHTMLMOD], section 4.3

* The attribute must be present.

** The value is the default.

3.8 Basic Tables Module

Elements	Attributes	Support
caption	Common	See Collectio
table	Common,	See Collectio
	summary (Text†)	No
	Common,	See Collectio
	abbr (Text†),	No
	align ("left" "center" "right"),	Yes
	axis (CDATA†),	No

td	colspan (Number†),	Yes
	headers (IDREFS†),	No
	rowspan (Number†),	Yes
	scope ("row" "col"),	No
	valign ("top" "middle" "bottom")	Yes
th	Common ,	See Collectio
	abbr (Text†),	No
	align ("left" "center" "right"),	Yes
	axis (CDATA†),	No
	colspan (Number†),	Yes
	headers (IDREFS†),	No
	rowspan (Number†),	Yes
	scope ("row" "col"),	No
	valign ("top" "middle" "bottom")	Yes
tr	Common ,	See Collectio
	align ("left" "center" "right"),	Yes
	valign ("top" "middle" "bottom")	Yes

Table Note:

† See [XHTMLMOD],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 so that it may print the value of the abbr attribute (if present) instead of the cell's content.

Vertical alignment is undefined across page boundaries.

3.9 Image Module

Elements	Attributes	Supported
img	Common ,	See Collection
	alt* (Text†),	Yes
	height (Length†),	Yes
	longdesc (URI†),	No
	src* (URI†),	Yes
	width (Length†)	Yes

Table Notes:

† See [XHTMLMOD],section 4.3

* The attribute must be present.

3.10 Object Module

Elements	Attributes	Support
	Common ,	See Collector

object	archive (URI†),	No
	classid (URI†),	No
	codebase (URI†),	Yes
	codetype (ContentType†),	No
	data (URI†),	Yes
	declare ("declare"),	No
	height (Length†),	Yes
	name (CDATA†),	No
	standby (Text†),	No
	tabindex (Number†),	No
	type ("image/jpeg"),	Yes
	width (Length†)	Yes
param	id (ID†),	No
	name* (CDATA†),	No
	type (ContentType†),	No
	value (CDATA†),	No
	valuetype ("data" ** "ref" "object")	No

Table Notes:

† See [XHTMLMOD],section 4.3

* The attribute must be present.

** The value is the default.

If the printer implements object storage then the declare attribute of the object element must be supported.

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

3.11 Metainformation Module

Elements	Attributes	Support
meta	I18N ,	See Collection
	content* (CDATA†),	No
	http-equiv (NMTOKEN†),	No
	name (NMTOKEN†),	No
	scheme (CDATA†)	No

Table Notes:

† See [XHTMLMOD],section 4.3

* The attribute must be present.

If the printer implements support for features of this element, the http-equiv attribute must be supported.

3.12 Style Sheet Module

Elements	Attributes	Supported
style	I18N ,	See Collection
	media (MediaDesc†),	Yes
	title (Text†),	No
	type* ("type/css"),	Yes
	xml:space="preserve"	Yes

Table Notes:

† See [XHTMLMOD],section 4.3

* The attribute must be present.

The CSS white-space property is preferred over the xml:space attribute.

3.13 Style Sheet Attribute Module

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

3.14 Link Module

Elements	Attributes	Supported
link	Common ,	See Collection
	charset (Charset†),	Yes
	href (URI†),	Yes
	hreflang (LanguageCode†),	No
	media (MediaDesc†),	Yes
	rel ("stylesheet"),	Yes
	rev (LinkTypes†),	No
	type ("text/css")	Yes

Table Note:

† See [XHTMLMOD],section 4.3

If the printer implements language selection then the hreflang attribute must be supported.

3.15 Base Module

Elements	Attributes	Supported
base	href* (URI†)	Yes

Table Notes:

† See [XHTMLMOD],section 4.3

* The attribute must be present.

3.16 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](#)], Section F.1).

4. How to Use XHTML-Print

XHTML-Print inherits all the structure, encoding and other basic infrastructure specified by XHTML1.0 [[XHTML1](#)]. 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](#), 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](#)]. See [Appendix A](#) 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](#)]. 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. Some low cost, resource constrained clients may want to include images in their print output but cannot afford to include a server. Some print applications may require that all the print data can be encapsulated in a single file for transportability, avoiding firewall issues, etc.

See [Appendix B](#) 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

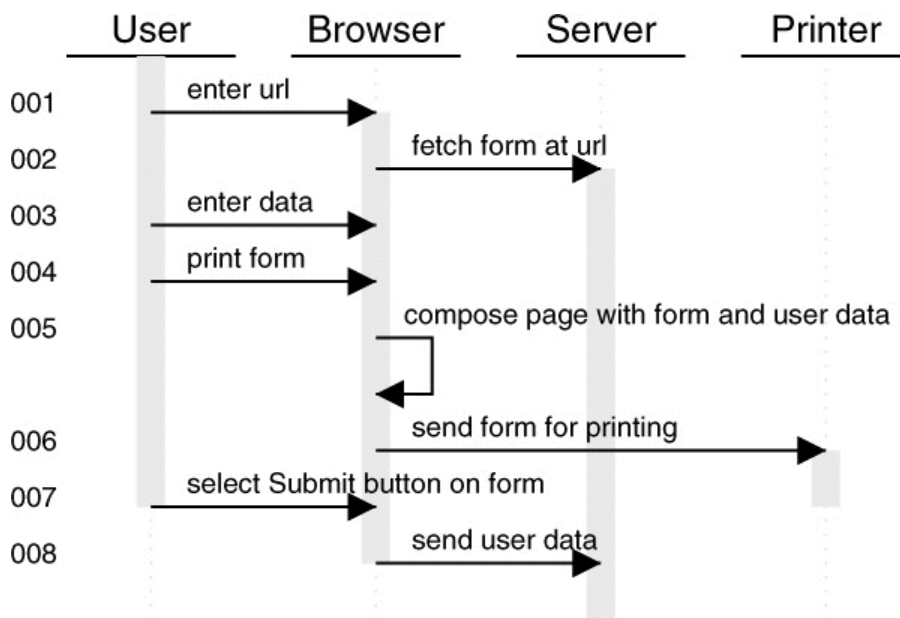
Low-cost printers today often have very little memory into which page data can be stored before being printed. As such, they may build and print the page in swaths on the fly from the top of the page to the bottom. To enable the use of XHTML-Print in these low cost printers, some restrictions on the 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 (`` or `<object data="http://10.10.10.2/images/logo.jpg">`) rather than included inline. (See [Appendix B](#)). This allows the printer to get chunks of the image, as it needs it, as it prints down the page.
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](#)



Sequence Diagram 1. Forms Usage

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](#)). 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

- The user enters data (line 3 of [Sequence Diagram 1](#)) 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

- The user then clicks on the browser's print button (line 4 of [Sequence Diagram 1](#)), to print the form as it currently appears.
- The browser then creates a, possibly new, document (line 5 of [Sequence Diagram 1](#)) 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" /><br />
<input type="checkbox" name="member" checked="checked"
value="IEEE" /> IEEE <br />
<input type="checkbox" name="member" value="ACM" /> ACM <br />
<input type="submit" value="Send" /> <input type="reset" /><br />
</form>
```

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

5. Acknowledgements

This section is informative.

This specification was prepared by the [PWG](#) XHTML-Print Working Group.

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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], 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.

Greyscale Images

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

$$R_{\text{out}} = G_{\text{out}} = B_{\text{out}} = \text{Gray}_{\text{in}}$$

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] 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](#) and [Printer Conformance](#) (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]. 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 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 conditionally mandatory; i.e. any device supporting Inline Image Data shall support this method. (See [Image Data](#).) Mandating support for Inline Image Data is outside the scope of this document.

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 "The MIME Application/Multiplexed Content-type", Robert Herriot [MIMEMPX]. For all printers that support inline data, [MIMEMPX] shall be supported.

Producers and consumers of Application/Vnd.pwg-multiplexed entities, as defined in [\[MIMEMPX\]](#), 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 Application/Vnd.pwg-multiplexed entity 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 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 [\[RFC2557\]](#). An exception to the rules given by [\[RFC2557\]](#) 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.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](#) 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="data:image/jpeg;base64,aGh67Fghsapa0Hji7dfGSweTa . . . ">
</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 [\[XHTMLMOD\]](#).

The following should be used from Modularization of XHTML [\[XHTMLMOD\]](#):

1. xhtml-attrs-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

```

<!-- .....
<!-- 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 2001-2003 Printer Working Group, 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 herei
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-print10.dtd,v 1.5 2003/02/09 06:59:04 fujisawa

-->
<!-- 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 "-//PWG//DTD XHTML-Print 1.0//EN"
SYSTEM "http://www.xhtml-print.org/xhtml-print/xhtml-print10.dtd"
-->
<!ENTITY % XHTML.version "-//PWG//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
%xhtml-inlstyle.mod;]]>

<!-- Document Model Module ..... -->
<!ENTITY % xhtml-model.mod
      PUBLIC "-//PWG//ENTITIES XHTML-Print 1.0 Document Model 1.0//EN"
           "http://www.pwg.org/xhtml-print/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-:
%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-:
%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
%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
%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.mo
%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.m
%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.m
%xhtml-struct.mod;

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

```

C.2. XHTML-Print 1.0 Document Model Module

```

<!-- .....
<!-- 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 2001-2003 Printer Working Group, All Rights Reserved.
    Revision: $Id: xhtml-print10-model-1.mod,v 1.5 2003/02/09 06:59:04 fuj:

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

        PUBLIC "-//PWG//ENTITIES XHTML-Print 1.0 Document Model 1.0//EN"
        SYSTEM "http://www.xhtml-print.org/xhtml-print/xhtml-print10-model-:
        .....

<!-- 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 -->
```

D. References

D.1. Normative References

[HTML4]

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