Abstract

XHTML-Print is member of the family of XHTML languages defined by the Modularization of XHTML [XHTMLMOD] [p.47]. 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. A list of current W3C publications and the latest revision of this technical report can be found in the W3C technical reports index at http://www.w3.org/TR/.

All sections of this document are normative unless noted as informative.
This document contains the XHTML™-Print W3C [Candidate Recommendation] of 20 January 2004 which has incorporated the [disposition of Last Call comments].

This specification is based, in large part, on a work by the same name, XHTML™-Print [XHTMLPRINT][p.47] from the Printer Working Group (PWG), a program of the IEEE Industry Standard and Technology Organization.

In order to exit the Candidate Recommendation phase, the following criteria must be satisfied:

1. At least two printers implement all the required features of this specification.
2. A minimum of six months of the CR period must be elapsed to ensure that enough time is given for providing implementation feedback.

A test suite for this specification will be created during the CR period. Detailed implementation requirements and the invitation for participation in the implementation report will be provided in the [preliminary implementation report]. Implementers are encouraged to provide feedback by 20 July 2004.

Comments are to be sent to www-html-editor@w3.org [archive]. It is inappropriate to send discussion email to this address. Public discussion may take place on www-html@w3.org [archive].

This document has been produced by the W3C HTML Working Group [Members only] as part of the W3C HTML Activity. The goals of the HTML Working Group are discussed in the HTML Working Group charter. Patent disclosures relevant to this specification can be found on the Working Group's patent disclosure page.

Publication as a Candidate Recommendation 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.

Table of Contents

- 1. Introduction [p.5]
  - 1.1. XHTML for Printing [p.5]
  - 1.2. Terminology [p.5]
  - 1.3. Design Rationale [p.6]
- 2. Conformance [p.9]
  - 2.1. Document Conformance [p.9]
  - 2.2. Client Conformance [p.9]
  - 2.3. Printer Conformance [p.10]
- 3. The XHTML-Print Document Type [p.13]
  - 3.1. Attributes and Attribute Collections [p.14]
  - 3.2. Structure Module [p.15]
  - 3.3. Text Module [p.16]
3.4. Hypertext Module [p. 16]
3.5. List Module [p. 17]
3.6. Presentation Module [p. 17]
3.7. Basic Forms Module [p. 17]
3.8. Basic Tables Module [p. 19]
3.9. Image Module [p. 21]
3.10. Object Module [p. 21]
3.11. Metainformation Module [p. 23]
3.12. Scripting Module [p. 23]
3.15. Link Module [p. 24]
3.16. Base Module [p. 25]
3.17. Character Entities [p. 26]

4. How to Use XHTML-Print [p. 27]
4.1. Recommended Attributes on the img and object Elements [p. 27]
4.2. Style Sheets [p. 27]
4.3. Image Data [p. 27]
4.4. Side-by-Side Images [p. 28]
4.5. Forms Usage [p. 28]

5. Acknowledgements [p. 33]

A. JPEG Decoder Requirements [p. 35]
A.1. Introduction [p. 35]
A.2. Behaviors of Minimal Printers [p. 35]
A.3. JPEG Decoder for XHTML-Print Enhanced Layout Extension [p. 36]

B. Image Data [p. 37]
B.1. Introduction [p. 37]
B.2. MIME type Application/Vnd.pwg-multiplexed [p. 37]
B.3. Using object for in-line Image Data [p. 38]

C. XHTML-Print DTD and Modules [p. 39]
C.1. XHTML-Print 1.0 DTD [p. 40]
C.2. XHTML-Print 1.0 Document Model Module [p. 43]

D. References [p. 47]
D.1. Normative References [p. 47]
D.2. Informative References [p. 49]
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.47] with the addition of Cascading Style Sheets (CSS) from CSS Print Profile [CSSPP][p.48]. 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.48] and proposed for CSS3 Paged Media [PAGEMEDIA][p.48] as defined in the CSS Print Profile [CSSPP][p.48] 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.47].

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.48]. However, for readability, these words might 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 treated as if its display property were set to the value "none" 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 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.47], 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.48]). However, printers *SHOULD* provide support for CSS within the limits of their device.

1.3.3. Forms

[Basic XHTML forms](#) ([XHTMLMOD][p.47], 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.47], 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.47]. 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.

1.3.7 Character Model

The W3C architectural specification Character Model for the World Wide Web 1.0 [CHARMOD][p.47] gives the RECOMMENDED representation of characters in XHTML-Print. Authors of XHTML-Print producing applications SHOULD be aware that low cost printers might be limited in both processing power and memory and therefore, that fully-normalized ([CHARMOD][p.47], 4.2.3) utf-8 encoded documents could print more quickly than documents in other forms and encodings.
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 \textit{SHALL} meet all of the following criteria:

1. The document \textit{SHALL} conform to the constraints expressed in the DTD found in \texttt{Appendix C} [p.39] and conform to the constraints expressed in \texttt{Design Rationale}[p.6].
2. The root element of the document \textit{MUST} be \texttt{html}.
3. The name of the default namespace on the root element \textit{SHALL} be the XHTML namespace \texttt{name}, \texttt{http://www.w3.org/1999/xhtml}.
4. There \textit{SHALL} be a DOCTYPE declaration in the document prior to the root element. If present, the public identifier included in the DOCTYPE declaration \textit{SHALL} reference the DTD found in either \texttt{Appendix C} [p.39] of this specification or Appendix C of XHTML-Print, \textit{PWG Proposed Standard 5102.1} (\texttt{XHTMLPRINT}[p.47]), Appendix C, using its Formal Public Identifier. The system identifier \textit{MAY} be modified appropriately. Use of the DTD from XHTML-Print, PWG Proposed Standard 5102.1 (\texttt{XHTMLPRINT}[p.47]), Appendix C is deprecated and it \textit{MAY} be removed from future versions of this specification.
\small
\begin{verbatim}
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML-Print 1.0//EN"
"http://www.w3.org/MarkUp/DTD/xhtml-print10.dtd">
\end{verbatim}

or
\small
\begin{verbatim}
<!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
"http://www.xhtml-print.org/xhtml-print/xhtml-print10.dtd">
\end{verbatim}

5. The DTD subset \textit{MUST NOT} be used to override any parameter entities in the DTD.

The MIME type used to refer to a conforming XHTML-Print document \textit{SHALL} be either "application/xhtml+xml" or "application/vnd.pwg-xhtml-print+xml". However, the MIME Type "application/vnd.pwg-xhtml-print+xml" is deprecated in favor of "application/xhtml+xml". Required support for the MIME Type "application/vnd.pwg-xhtml-print+xml" \textit{MAY} be removed from future releases of this specification. An \textit{OPTIONAL} "charset" parameter \textit{MAY} be provided with the MIME type. Invalid values \textit{MUST} be ignored and the result be as if the value were "utf-8". Usage of the \textit{OPTIONAL} "charset" parameter is as described in section 3.2 of RFC3023 - XML Media Types [RFC3023][p.49].

2.2. Client Conformance

1. Clients \textit{SHALL} produce a well-formed XHTML-Print document as defined in XHTML 1.0 \texttt{[XHTML1][p.47]} and in \texttt{Document Conformance}[p.9].
2. Beyond number 1 above, clients are not \textit{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](XHTMLMOD) section of the Modularization of XHTML specification ([XHTMLMOD][47], 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 **MUST** support images referenced by a URI [RFC2396] [48] containing a scheme name cid [RFC2392] [48] or http [RFC2616] [49]. Support for other schemes is **OPTIONAL**.
3. Printers that do not support the `xml:lang` attribute are not **REQUIRED** to adhere to the rules for language specific white space handling.

2.3.2 XHTML Requirements

1. A conforming printer **SHALL** support all XHTML Modules listed in [The XHTML-Print Document Type][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 image data **SHALL** support RFC3391 - The MIME Application/Vnd.pwg-multiplexed Content-Type [MIMEMPX][48] 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, either the string "application/xhtml-print+xml" or "application/vnd.pwg-xhtml-print+xml" **SHALL** be used. However, "application/vnd.pwg-xhtml-print+xml" is deprecated.
5. A conforming printer **SHOULD** support the CSS constructs and associated values given in the CSS Print Profile [CSSPP][48]; 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.48] 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:

```xml
<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.47].

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.39].
### 3.1 Attributes and Attribute Collections

Some of the attributes defined in the *Modularization of XHTML* \[XHTMLMOD\[p.47\] ] 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:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUST</td>
<td>Support is mandatory; a conforming printer <em>MUST</em> implement this attribute</td>
</tr>
<tr>
<td>SHOULD</td>
<td>The attribute is concerned with functionality that <em>SHOULD</em> be implemented but might 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 <em>MUST NOT</em> treat this attribute as an error.</td>
</tr>
<tr>
<td>MAY</td>
<td>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 <em>REQUIRED</em> of a conforming printer. A conforming printer <em>MUST NOT</em> treat this attribute as an error.</td>
</tr>
</tbody>
</table>
| 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 *MUST NOT* 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\[p.47\] ], 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.
Table Note:

† See Modularization of XHTML ([XHTMLMOD][p.47], 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 guillemets 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 the 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

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>body</td>
<td>Common[p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>head</td>
<td>I18N[p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>head</td>
<td>profile [URI][p.16]</td>
<td>MAY[p.14]</td>
</tr>
<tr>
<td>html</td>
<td>I18N[p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>html</td>
<td>version [CDATA][p.16],</td>
<td>N/A[p.14]</td>
</tr>
<tr>
<td>title</td>
<td>I18N[p.15]</td>
<td>See Collection</td>
</tr>
</tbody>
</table>

Table Note:
† See Modularization of XHTML ( [XHTMLMOD][p.47] ), section 4.3

If a 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.47] 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

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>abbr, acronym, address</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>blockquote</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>blockquote</td>
<td>cite (URI)[p.16]</td>
<td>[N/A][p.14]</td>
</tr>
<tr>
<td>br</td>
<td>[Core][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>cite, code, dfn, div, em, h1, h2, h3, h4, h5, h6, kbd, p</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>pre</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>pre</td>
<td>xml:space=&quot;preserve&quot;</td>
<td>[MUST][p.14]</td>
</tr>
<tr>
<td>q</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>q</td>
<td>cite (URI)[p.16]</td>
<td>[N/A][p.14]</td>
</tr>
<tr>
<td>samp, span, strong, var</td>
<td>[Common][p.15]</td>
<td>See Collection</td>
</tr>
</tbody>
</table>

Table Note:

† See Modularization of XHTML ( [XHTMLMOD][p.47] ), section 4.3

### 3.4 Hypertext Module
### 3.5 List Module

<table>
<thead>
<tr>
<th>Element</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td></td>
<td>See Collection</td>
</tr>
</tbody>
</table>

Table Note:
† See Modularization of XHTML (XHTMLMOD[p.47], section 4.3)

### 3.6 Presentation Module

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>b, big, hr, i, small, sub, sup, tt</td>
<td>Common[p.15]</td>
<td>See Collection</td>
</tr>
</tbody>
</table>

### 3.7 Basic Forms Module

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>form</td>
<td></td>
<td>See Collection</td>
</tr>
</tbody>
</table>

- The table above lists the elements and attributes for each module, along with their requirements.
- The table note refers to the Modularization of XHTML for more information.
- The list module element includes attributes such as `href`, `hreflang`, `rel`, `rev`, `tabindex`, and `type`, which are required or not applicable based on the context.
- The presentation module includes elements like `b`, `big`, `hr`, `i`, `small`, `sub`, `sup`, and `tt`, with their respective attributes.
- The basic forms module details the `form` element with attributes like `action`, `method`, and `enctype`, along with their requirements.
<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>accesskey</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>checked</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>maxlength</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>name</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>size</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>src</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>tabindex</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;text&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;password&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;checkbox&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;radio&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;submit&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;reset&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>type(&quot;hidden&quot;)</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>input</td>
<td>value</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>label</td>
<td>accesskey</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>label</td>
<td>for</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>select</td>
<td>name</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>select</td>
<td>size</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>select</td>
<td>tabindex</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>option</td>
<td>selected</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>option</td>
<td>value</td>
<td>MUST [p.14]</td>
</tr>
</tbody>
</table>
### 3.8 Basic Tables Module

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>textarea</td>
<td>[Common][p.15] ,</td>
<td>See Collection</td>
</tr>
<tr>
<td>textarea</td>
<td>accesskey [Character][p.19] ,</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>textarea</td>
<td>cols [p.19] [Number][p.19] ,</td>
<td>MUST [p.14]</td>
</tr>
<tr>
<td>textarea</td>
<td>name [CDATA][p.19] ,</td>
<td>N/A [p.14]</td>
</tr>
</tbody>
</table>

Table Notes:

† See Modularization of XHTML ([XHTMLMOD][p.47], 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.
### Elements

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>caption</td>
<td>Common[p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>table</td>
<td>Common[p.15]</td>
<td>See Collection</td>
</tr>
<tr>
<td>table</td>
<td>summary (Text)[p.20)</td>
<td>N/A[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>Common[p.15],</td>
<td>See Collection</td>
</tr>
<tr>
<td>td, th</td>
<td>abbr (Text)[p.20),</td>
<td>MAY[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>align (&quot;left&quot;</td>
<td>&quot;center&quot;</td>
</tr>
<tr>
<td>td, th</td>
<td>axis [CDATA][p.20),</td>
<td>N/A[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>colspan (Number)[p.20),</td>
<td>MUST[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>headers (IDREFS)[p.20),</td>
<td>N/A[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>rowspan (Number)[p.20),</td>
<td>MUST[p.14]</td>
</tr>
<tr>
<td>td, th</td>
<td>scope (&quot;row&quot;</td>
<td>&quot;col&quot;),</td>
</tr>
<tr>
<td>td, th</td>
<td>valign (&quot;top&quot;</td>
<td>&quot;middle&quot;</td>
</tr>
<tr>
<td>tr</td>
<td>Common[p.15],</td>
<td>See Collection</td>
</tr>
<tr>
<td>tr</td>
<td>align (&quot;left&quot;</td>
<td>&quot;center&quot;</td>
</tr>
<tr>
<td>tr</td>
<td>valign (&quot;top&quot;</td>
<td>&quot;middle&quot;</td>
</tr>
</tbody>
</table>

### Table Note:

† See Modularization of XHTML ([XHTMLMOD][p.47], 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

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>img</td>
<td>Common[p.15],</td>
<td>See Collection</td>
</tr>
<tr>
<td>img</td>
<td>height Length[p.21],</td>
<td>MUST[p.14]</td>
</tr>
<tr>
<td>img</td>
<td>longdesc URI[p.21],</td>
<td>N/A[p.14]</td>
</tr>
<tr>
<td>img</td>
<td>src URI[p.21],</td>
<td>MUST[p.14]</td>
</tr>
<tr>
<td>img</td>
<td>width Length[p.21]</td>
<td>MUST[p.14]</td>
</tr>
</tbody>
</table>

Table Notes:

† See Modularization of XHTML ([XHTMLMOD][p.47]), section 4.3

* The attribute MUST be present.

Printers MUST support the cid[RFC2392][p.48] and http[RFC2616][p.49] schemes of a URI [RFC2396][p.48]. Support for other schemes is OPTIONAL.

Conforming documents SHOULD specify the width and height of the image using the width and height attributes, since a printer MAY ignore images that are missing these attributes. (2.3.1 Formatting/Rendering Rules[p.10]).

### 3.10 Object Module
<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>object</td>
<td>Common ![p.15]</td>
<td>See Collections</td>
</tr>
<tr>
<td>object</td>
<td>archive ![URIs][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>classid ![URI][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>codebase ![URI][p.22]</td>
<td><strong>MUST</strong> ![p.14]</td>
</tr>
<tr>
<td>object</td>
<td>codetype ![ContentType][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>data ![URI][p.22]</td>
<td><strong>MUST</strong> ![p.14]</td>
</tr>
<tr>
<td>object</td>
<td>declare (&quot;declare&quot;)</td>
<td><strong>MAY</strong> ![p.14]</td>
</tr>
<tr>
<td>object</td>
<td>height ![Length][p.22]</td>
<td><strong>MUST</strong> ![p.14]</td>
</tr>
<tr>
<td>object</td>
<td>name ![CDATA][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>standby ![Text][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>tabindex ![Number][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>object</td>
<td>type (&quot;image/jpeg&quot;)</td>
<td><strong>MUST</strong> ![p.14]</td>
</tr>
<tr>
<td>object</td>
<td>width ![Length][p.22]</td>
<td><strong>MUST</strong> ![p.14]</td>
</tr>
<tr>
<td>param</td>
<td>id ![ID][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>param</td>
<td>name ![CDATA][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>param</td>
<td>type ![ContentType][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>param</td>
<td>value ![CDATA][p.22]</td>
<td>![N/A][p.14]</td>
</tr>
<tr>
<td>param</td>
<td>valuetype (&quot;data&quot; ![p.22]</td>
<td>![N/A][p.14]</td>
</tr>
</tbody>
</table>

Table Notes:

† See Modularization of XHTML ([XHTMLMOD][p.47], section 4.3)

* The attribute **MUST** be present.

** The value is the default.

Printers **MUST** support the cid ![RFC2392][p.48] and http ![RFC2616][p.49] schemes of a URI ![RFC2395][p.48]. Support for other schemes is **OPTIONAL**.

A printer **MUST** support resources of type "image/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.
Conforming documents SHOULD specify the width and height of the image using the \texttt{width} and \texttt{height} attributes, since some printers MAY ignore such images. (2.3.1 Formatting/Rendering Rules[p.10]).

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

### 3.11 Metainformation Module

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>meta</td>
<td></td>
<td>See Collection</td>
</tr>
<tr>
<td>meta</td>
<td>content</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>meta</td>
<td>http-equiv</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>meta</td>
<td>name</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>meta</td>
<td>scheme</td>
<td>N/A [p.14]</td>
</tr>
</tbody>
</table>

Table Notes:

† See Modularization of XHTML (XHTMLMOD[p.47], 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

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>noscript</td>
<td></td>
<td>See Collections</td>
</tr>
<tr>
<td>script</td>
<td>charset</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>script</td>
<td>defer</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>script</td>
<td>src</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>script</td>
<td>type</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>script</td>
<td>scheme</td>
<td>N/A [p.14]</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>style</td>
<td>I18N [p.15],</td>
<td>See Collection</td>
</tr>
<tr>
<td>style</td>
<td>media (MediaDesc [p.24]),</td>
<td>SHOULD [p.14]</td>
</tr>
<tr>
<td>style</td>
<td>title (Text [p.24]),</td>
<td>N/A [p.14]</td>
</tr>
<tr>
<td>style</td>
<td>xml:space=&quot;preserve&quot;</td>
<td>SHOULD [p.14]</td>
</tr>
</tbody>
</table>

Table Notes:

† See Modularization of XHTML (XHTMLMOD [p.47]), 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 treated as if the media attribute had the value all.

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
3.16 Base Module

<table>
<thead>
<tr>
<th>Elements</th>
<th>Attributes</th>
<th>REQUIRED Processing</th>
</tr>
</thead>
</table>

Table Notes:

† See Modularization of XHTML ( [XHTMLMOD] [p.47], section 4.3 )
* The attribute *MUST* be present.

Printers *MUST* support the cid ([RFC2392] [p.48] and http ([RFC2616] [p.49] schemes of a URI ([RFC2396] [p.48]). 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.47]), 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.47]. 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.48]. 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 (JPEG File Interchange Format) and EXIF (Exchangeable Image File Format) 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.47]. 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 might want to include images in their print output but cannot afford to include a server. Furthermore, some printers could 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. 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. Included image data, as 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 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 can 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 might 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 newly 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 (steps 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">
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 (step 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 (step 4 of Sequence Diagram 1 [p. 29]), to print the form as it currently appears.

4. The browser then creates a, possibly new, document (step 5 of Sequence Diagram 1 [p. 29]) containing the original form and the user’s 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" 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>

- 30 -
5. The browser sends (step 6 of Sequence Diagram 1[p.29]) the document created in step 5 to the printer.

6. Sometime later the user clicks on the submit form button (step 7 of Sequence Diagram 1[p.29]) and the browser submits the form (step 8 of Sequence Diagram 1[p.29]) using the procedures given in the HTML 4.01 Specification ([HTML4][p.47], Forms Submission).
5. Acknowledgements

This section is informative.

This specification was prepared by the W3C HTML Working Group. The participants at the time of publication were:

List will be inserted when this document becomes a Recommendation.

This specification is based on the specification of the same name, XHTML™-Print [XHTMLPRINT][p.47], 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 (Exchangeable Image File Format) and baseline JFIF (JPEG File Interchange Format) 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.48]], 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

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

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 [p. 49]] 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. 10] (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. 48]. The following IFDs MAY be supported. However, any future XHTML elements or CSS properties affecting image orientation SHALL take precedence over these IFDs.

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation of Image</td>
<td>Orientation</td>
<td>Sets image orientation in 90-degree increments, and enables transposition.</td>
</tr>
</tbody>
</table>
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 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/Vnd.pwg-multiplexed

This section includes by reference the entirety of RFC3391 - The MIME Application/Vnd.pwg-multiplexed Content-type, Robert Herriot [MIMEMPX][p.48]. All printers MUST support image data using RFC3391[MIMEMPX][p.48].

Producers and consumers of Application/Vnd.pwg-multiplexed entities (compound documents), as defined in [MIMEMPX][p.48], 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 - MIME Encapsulation of Aggregate Documents, such as HTML (MHTML) [RFC2557][p.49]. An exception to the rules occurs when a reference is made to a message object named with a Content-Location [RFC2557][p.49]. 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.48] 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, where an image header is the data from the beginning of the image up to and including the start of scan marker. Furthermore, the printer will immediately know if the image is present or if its alternate content has to be printed. On the other hand, when several images will be placed on a page, some low-cost printers might 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 could be interleaved to further reduce the memory needed to store the images while printing.

B.3 Using object for Included Image Data

This section is informative.

An alternative method to include image data in XHTML-Print is via the data url scheme [RFC2392][p.48]. 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 included data can support base64 encoding using the img or object element.

```
<object height="20 mm" width="20 mm" type="image/jpeg"
   data="data:image/jpeg;base64,aGh67Fghsapa0Hji7dfGSweTa . . .">
   Example Image </object>
```

or

```
<img height="20 mm" width="20 mm" alt="Example Image"
   src="data:image/jpeg;base64,aGh67Fghsapa0Hji7dfGSweTa . . ." />
```

This method could be useful for very simple clients that cannot afford a server for image downloading or for some reason cannot utilize the Application/Vnd.pwg-multiplexed MIME type [MIMEMPX][p.48]; however, it is not suggested 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.47].

The following SHOULD be used from Modularization of XHTML [XHTMLMOD][p.47]:

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-script-1.mod
27. xhtml-special.ent
28. xhtml-struct-1.mod
29. xhtml-style-1.mod
30. xhtml-symbol.ent
31. 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.

(Massachusetts Institute of Technology, European Research
Consortium for Informatics and Mathematics, Keio University).
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Permission to use, copy, modify and distribute the XHTML-Print DTD and
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this paragraph appear in all copies. The copyright holders make no
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Revision: $Id: xhtml-print10.dtd,v 1.5 2003/10/24 14:24:40 fujisawa 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"
   "http://www.w3.org/TR/xhtml-modularization/DTD/xhtml-print10-model-1.mod" >
%xhtml-model.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;

<!-- ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: -->
<!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;]]>
C.2. XHTML-Print 1.0 Document Model Module

Available for download at 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.

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.w3.org/MarkUp/DTD/xhtml-print10-model-1.mod"

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

Optional Elements in head ................. -->
<!ENTITY % HeadOpts.mix "('%script.qname; | %style.qname; | %meta.qname; | %link.qname;
 | %object.qname; )*" >

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

<!-- 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;" >
D. References

D.1. Normative References

[CHARMOD]

[HTML4]

[XHTML1]

[XHTML1.1]

[XHTMLBASIC]

[XHTMLMOD]

[XHTMLPRINT]

[XML]
D.1. Normative References

[CSSPP]

[CSS1]

[CSS2]

[PAGEMEDIA]

[RFC2119]

[JPEG]

[CCITT]

[JEIDA]

[MIMEMPX]

[RFC2392]

[RFC2396]
http://www.ietf.org/rfc/rfc2396.txt

[RFC2397]  

[RFC2616]  

[RFC3023]  

[RFC3236]  

[RFC2557]  

[BT601.5]  

D.2. Informative References

none