## <http://www.w3.org/TR/html5/#auto-toc-1>

## 1 Introduction

### 1.1 Background

### 1.2 Audience*.*

### 1.3 Scope

This specification is limited to providing a semantic-level markup language and associated semantic-level scripting APIs for authoring accessible pages on the Web ranging from static documents to dynamic applications.

The scope of this specification does not include providing mechanisms for media-specific customization of presentation (although default rendering rules for Web browsers are included at the end of this specification, and several mechanisms for hooking into CSS are provided as part of the language).

The scope of this specification is not to describe an entire operating system. In particular, hardware configuration software, image manipulation tools, and applications that users would be expected to use with high-end workstations on a daily basis are out of scope. In terms of applications, this specification is targeted specifically at applications that would be expected to be used by users on an occasional basis, or regularly but from disparate locations, with low CPU requirements. For instance online purchasing systems, searching systems, games (especially multiplayer online games), public telephone books or address books, communications software (e-mail clients, instant messaging clients, discussion software), document editing software, etc.

### 1.4 History

### 1.5 Design notes

#### 1.5.1 Serializability of script execution.

#### 1.5.2 Compliance with other specifications

### 1.6 HTML vs XHTML

This specification defines an abstract language for describing documents and applications, and some APIs for interacting with in-memory representations of resources that use this language.

The in-memory representation is known as "DOM HTML", or "the DOM" for short. This specification defines version 5 of DOM HTML, known as "DOM5 HTML".

There are various concrete syntaxes that can be used to transmit resources that use this abstract language, two of which are defined in this specification.

The first such concrete syntax is the HTML syntax. This is the format suggested for most authors. It is compatible with most legacy Web browsers. If a document is transmitted with an [HTML MIME type](http://www.w3.org/TR/html5/infrastructure.html#html-mime-type), such as [text/html](http://www.w3.org/TR/html5/iana.html#text-html), then it will be processed as an HTML document by Web browsers. This specification defines version 5 of the HTML syntax, known as "HTML5".

The second concrete syntax is the XHTML syntax, which is an application of XML. When a document is transmitted with an [XML MIME type](http://www.w3.org/TR/html5/infrastructure.html#xml-mime-type), such as [application/xhtml+xml](http://www.w3.org/TR/html5/iana.html#application-xhtml-xml), then it is treated as an XML document by Web browsers, to be parsed by an XML processor. Authors are reminded that the processing for XML and HTML differs; in particular, even minor syntax errors will prevent a document labeled as XML from being rendered fully, whereas they would be ignored in the HTML syntax. This specification defines version 5 of the XHTML syntax, known as "XHTML5".

The DOM, the HTML syntax, and XML cannot all represent the same content. For example, namespaces cannot be represented using the HTML syntax, but they are supported in the DOM and in XML. Similarly, documents that use the [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) feature can be represented using the HTML syntax, but cannot be represented with the DOM or in XML. Comments that contain the string "-->" can only be represented in the DOM, not in the HTML and XML syntaxes.

### 1.7 Structure of this specification

This specification is divided into the following major sections:

[Common infrastructure](http://www.w3.org/TR/html5/infrastructure.html#infrastructure)

The conformance classes, algorithms, definitions, and the common underpinnings of the rest of the specification.

[Semantics, structure, and APIs of HTML documents](http://www.w3.org/TR/html5/dom.html#dom)

Documents are built from elements. These elements form a tree using the DOM. This section defines the features of this DOM, as well as introducing the features common to all elements, and the concepts used in defining elements.

[The elements of HTML](http://www.w3.org/TR/html5/semantics.html#semantics)

Each element has a predefined meaning, which is explained in this section. Rules for authors on how to use the element, along with user agent requirements for how to handle each element, are also given.

[Loading Web pages](http://www.w3.org/TR/html5/browsers.html#browsers)

HTML documents do not exist in a vacuum — this section defines many of the features that affect environments that deal with multiple pages.

[Web application APIs](http://www.w3.org/TR/html5/webappapis.html#webappapis)

This section introduces basic features for scripting of applications in HTML.

[User interaction](http://www.w3.org/TR/html5/editing.html#editing)

HTML documents can provide a number of mechanisms for users to interact with and modify content, which are described in this section.

[The HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax)

[The XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xhtml)

All of these features would be for naught if they couldn't be represented in a serialized form and sent to other people, and so these sections define the syntaxes of HTML, along with rules for how to parse content using those syntaxes.

There are also some appendices, defining [rendering rules](http://www.w3.org/TR/html5/rendering.html#rendering) for Web browsers and listing [obsolete features](http://www.w3.org/TR/html5/obsolete.html#obsolete) and [IANA considerations](http://www.w3.org/TR/html5/iana.html#iana).

#### 1.7.1 How to read this specification

#### 1.7.2 Typographic conventions

This is a definition, requirement, or explanation.

This is a note.

This is an example.

This is an open issue.

This is a warning.

interface Example {

// this is an IDL definition

};

variable = object . method( [ optionalArgument ] )

This is a note to authors describing the usage of an interface.

/\* this is a CSS fragment \*/

The defining instance of a term is marked up like this. Uses of that term are marked up like [this](http://www.w3.org/TR/html5/introduction.html#x-this) or like [*this*](http://www.w3.org/TR/html5/introduction.html#x-this).

The defining instance of an element, attribute, or API is marked up like *this*. References to that element, attribute, or API are marked up like [this](http://www.w3.org/TR/html5/introduction.html#x-that).

Other code fragments are marked up like this.

Variables are marked up like this.

This is an implementation requirement.

### 1.8 A quick introduction to HTML

A basic HTML document looks like this:

<!DOCTYPE html>

<html>

<head>

<title>Sample page</title>

</head>

<body>

<h1>Sample page</h1>

<p>This is a <a href="demo.html">simple</a> sample.</p>

<!-- this is a comment -->

</body>

</html>

HTML documents consist of a tree of elements and text. Each element is denoted in the source by a [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag), such as "<body>", and an [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag), such as "</body>". (Certain start tags and end tags can in certain cases be [omitted](http://www.w3.org/TR/html5/syntax.html#syntax-tag-omission) and are implied by other tags.)

Tags have to be nested such that elements are all completely within each other, without overlapping:

<p>This is <em>very <strong>wrong</em>!</strong></p>

<p>This <em>is <strong>correct</strong>.</em></p>

This specification defines a set of elements that can be used in HTML, along with rules about the ways in which the elements can be nested.

Elements can have attributes, which control how the elements work. In the example below, there is a [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink), formed using the [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element and its [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute:

<a href="demo.html">simple</a>

[Attributes](http://www.w3.org/TR/html5/syntax.html#syntax-attributes) are placed inside the start tag, and consist of a [name](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-name) and a [value](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-value), separated by an "=" character. The attribute value can remain [unquoted](http://www.w3.org/TR/html5/syntax.html#unquoted) if it doesn't contain spaces or any of " ' ` = < or >. Otherwise, it has to be quoted using either single or double quotes. The value, along with the "=" character, can be omitted altogether if the value is the empty string.

<!-- empty attributes -->

<input name=address disabled>

<input name=address disabled="">

<!-- attributes with a value -->

<input name=address maxlength=200>

<input name=address maxlength='200'>

<input name=address maxlength="200">

HTML user agents (e.g. Web browsers) then *parse* this markup, turning it into a DOM (Document Object Model) tree. A DOM tree is an in-memory representation of a document.

DOM trees contain several kinds of nodes, in particular a DOCTYPE node, elements, text nodes, and comment nodes.

The [markup snippet at the top of this section](http://www.w3.org/TR/html5/introduction.html#intro-early-example) would be turned into the following DOM tree:

* DOCTYPE: html
* [html](http://www.w3.org/TR/html5/semantics.html#the-html-element)
  + [head](http://www.w3.org/TR/html5/semantics.html#the-head-element)
    - #text: ⏎␣␣
    - [title](http://www.w3.org/TR/html5/semantics.html#the-title-element)
      * #text: Sample page
    - #text: ⏎␣
  + #text: ⏎␣
  + [body](http://www.w3.org/TR/html5/sections.html#the-body-element)
    - #text: ⏎␣␣
    - [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)
      * #text: Sample page
    - #text: ⏎␣␣
    - [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element)
      * #text: This is a
      * [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) href="demo.html"
        + #text: simple
      * #text: sample.
    - #text: ⏎␣␣
    - #comment: this is a comment
    - #text: ⏎␣⏎

The [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) of this tree is the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element, which is the element always found at the root of HTML documents. It contains two elements, [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) and [body](http://www.w3.org/TR/html5/sections.html#the-body-element), as well as a text node between them.

There are many more text nodes in the DOM tree than one would initially expect, because the source contains a number of spaces (represented here by "␣") and line breaks ("⏎") that all end up as text nodes in the DOM. However, for historical reasons not all of the spaces and line breaks in the original markup appear in the DOM. In particular, all the whitespace before [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) start tag ends up being dropped silently, and all the whitespace after the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) end tag ends up placed at the end of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element).

The [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element contains a [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element, which itself contains a text node with the text "Sample page". Similarly, the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element contains an [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) element, a [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) element, and a comment.

This DOM tree can be manipulated from scripts in the page. Scripts (typically in JavaScript) are small programs that can be embedded using the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element or using [event handler content attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes). For example, here is a form with a script that sets the value of the form's [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element) element to say "Hello World":

<[form](http://www.w3.org/TR/html5/forms.html#the-form-element) [name](http://www.w3.org/TR/html5/forms.html#attr-form-name)="main">

Result: <[output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element) [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name)="result"></output>

<[script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element)>

[document](http://www.w3.org/TR/html5/dom.html#htmldocument).[forms](http://www.w3.org/TR/html5/dom.html#dom-document-forms).main.[elements](http://www.w3.org/TR/html5/forms.html#dom-form-elements).result.[value](http://www.w3.org/TR/html5/the-button-element.html#dom-output-value) = 'Hello World';

</script>

</form>

Each element in the DOM tree is represented by an object, and these objects have APIs so that they can be manipulated. For instance, a link (e.g. the [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element in the tree above) can have its "[href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href)" attribute changed in several ways:

var a = [document](http://www.w3.org/TR/html5/dom.html#htmldocument).[links](http://www.w3.org/TR/html5/dom.html#dom-document-links)[0]; // obtain the first link in the document

a.[href](http://www.w3.org/TR/html5/text-level-semantics.html#dom-a-href) = 'sample.html'; // change the destination URL of the link

a.[protocol](http://www.w3.org/TR/html5/urls.html#dom-uda-protocol) = 'https'; // change just the scheme part of the URL

a.setAttribute('href', 'http://example.com/'); // change the content attribute directly

Since DOM trees are used as the way to represent HTML documents when they are processed and presented by implementations (especially interactive implementations like Web browsers), this specification is mostly phrased in terms of DOM trees, instead of the markup described above.

HTML documents represent a media-independent description of interactive content. HTML documents might be rendered to a screen, or through a speech synthesizer, or on a braille display. To influence exactly how such rendering takes place, authors can use a styling language such as CSS.

In the following example, the page has been made yellow-on-blue using CSS.

<!DOCTYPE html>

<html>

<head>

<title>Sample styled page</title>

<style>

body { background: navy; color: yellow; }

</style>

</head>

<body>

<h1>Sample styled page</h1>

<p>This page is just a demo.</p>

</body>

</html>

For more details on how to use HTML, authors are encouraged to consult tutorials and guides. Some of the examples included in this specification might also be of use, but the novice author is cautioned that this specification, by necessity, defines the language with a level of detail that might be difficult to understand at first.

### 1.9 Conformance requirements for authors

#### 1.9.1 Presentational markup

The majority of presentational features from previous versions of HTML are no longer allowed. Presentational markup in general has been found to have a number of problems:

The use of presentational elements leads to poorer accessibility

While it is possible to use presentational markup in a way that provides users of assistive technologies (ATs) with an acceptable experience (e.g. using ARIA), doing so is significantly more difficult than doing so when using semantically-appropriate markup. Furthermore, even using such techniques doesn't help make pages accessible for non-AT non-graphical users, such as users of text-mode browsers.

Using media-independent markup, on the other hand, provides an easy way for documents to be authored in such a way that they work for more users (e.g. text browsers).

Higher cost of maintenance

It is significantly easier to maintain a site written in such a way that the markup is style-independent. For example, changing the color of a site that uses <font color=""> throughout requires changes across the entire site, whereas a similar change to a site based on CSS can be done by changing a single file.

Higher document sizes

Presentational markup tends to be much more redundant, and thus results in larger document sizes.

For those reasons, presentational markup has been removed from HTML in this version. This change should not come as a surprise; HTML4 deprecated presentational markup many years ago and provided a mode (HTML4 Transitional) to help authors move away from presentational markup; later, XHTML 1.1 went further and obsoleted those features altogether.

The only remaining presentational markup features in HTML are the [style](http://www.w3.org/TR/html5/elements.html#the-style-attribute) attribute and the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element. Use of the [style](http://www.w3.org/TR/html5/elements.html#the-style-attribute) attribute is somewhat discouraged in production environments, but it can be useful for rapid prototyping (where its rules can be directly moved into a separate style sheet later) and for providing specific styles in unusual cases where a separate style sheet would be inconvenient. Similarly, the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element can be useful in syndication or for page-specific styles, but in general an external style sheet is likely to be more convenient when the styles apply to multiple pages.

It is also worth noting that some elements that were previously presentational have been redefined in this specification to be media-independent: [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element), [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element), [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element), [s](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element), [small](http://www.w3.org/TR/html5/text-level-semantics.html#the-small-element), and [u](http://www.w3.org/TR/html5/text-level-semantics.html#the-u-element).

#### 1.9.2 Syntax errors

The syntax of HTML is constrained to avoid a wide variety of problems.

Unintuitive error-handling behavior

Certain invalid syntax constructs, when parsed, result in DOM trees that are highly unintuitive.

For example, the following markup fragment results in a DOM with an [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element that is an earlier sibling of the corresponding [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element:

<table><hr>...

Errors with optional error recovery

To allow user agents to be used in controlled environments without having to implement the more bizarre and convoluted error handling rules, user agents are permitted to fail whenever encountering a [parse error](http://www.w3.org/TR/html5/parsing.html#parse-error).

Errors where the error-handling behavior is not compatible with streaming user agents

Some error-handling behavior, such as the behavior for the <table><hr>... example mentioned above, are incompatible with streaming user agents (user agents that process HTML files in one pass, without storing state). To avoid interoperability problems with such user agents, any syntax resulting in such behavior is considered invalid.

Errors that can result in infoset coercion

When a user agent based on XML is connected to an HTML parser, it is possible that certain invariants that XML enforces, such as comments never containing two consecutive hyphens, will be violated by an HTML file. Handling this can require that the parser coerce the HTML DOM into an XML-compatible infoset. Most syntax constructs that require such handling are considered invalid.

Errors that result in disproportionally poor performance

Certain syntax constructs can result in disproportionally poor performance. To discourage the use of such constructs, they are typically made non-conforming.

For example, the following markup results in poor performance, since all the unclosed [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element) elements have to be reconstructed in each paragraph, resulting in progressively more elements in each paragraph:

<p><i>He dreamt.

<p><i>He dreamt that he ate breakfast.

<p><i>Then lunch.

<p><i>And finally dinner.

The resulting DOM for this fragment would be:

* [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element)
  + [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
    - #text: He dreamt.
* [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element)
  + [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
    - [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
      * #text: He dreamt that he ate breakfast.
* [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element)
  + [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
    - [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
      * [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
        + #text: Then lunch.
* [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element)
  + [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
    - [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
      * [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)
        + [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element)

#text: And finally dinner.

Errors involving fragile syntax constructs

There are syntax constructs that, for historical reasons, are relatively fragile. To help reduce the number of users who accidentally run into such problems, they are made non-conforming.

For example, the parsing of certain named character references in attributes happens even with the closing semicolon being omitted. It is safe to include an ampersand followed by letters that do not form a named character reference, but if the letters are changed to a string that does form a named character reference, they will be interpreted as that character instead.

In this fragment, the attribute's value is "?bill&ted":

<a href="?bill&ted">Bill and Ted</a>

In the following fragment, however, the attribute's value is actually "?art©", not the intended "?art&copy", because even without the final semicolon, "&copy" is handled the same as "&copy;" and thus gets interpreted as "©":

<a href="?art&copy">Art and Copy</a>

To avoid this problem, all named character references are required to end with a semicolon, and uses of named character references without a semicolon are flagged as errors.

Thus, the correct way to express the above cases is as follows:

<a href="?bill&ted">Bill and Ted</a> <!-- &ted is ok, since it's not a named character reference -->

<a href="?art&amp;copy">Art and Copy</a> <!-- the & has to be escaped, since &copy is a named character reference -->

Errors involving known interoperability problems in legacy user agents

Certain syntax constructs are known to cause especially subtle or serious problems in legacy user agents, and are therefore marked as non-conforming to help authors avoid them.

For example, this is why the U+0060 GRAVE ACCENT character (`) is not allowed in unquoted attributes. In certain legacy user agents, it is sometimes treated as a quote character.

Another example of this is the DOCTYPE, which is required to trigger [no-quirks mode](http://www.w3.org/TR/html5/dom.html#no-quirks-mode), because the behavior of legacy user agents in [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode) is often largely undocumented.

Errors that risk exposing authors to security attacks

Certain restrictions exist purely to avoid known security problems.

For example, the restriction on using UTF-7 exists purely to avoid authors falling prey to a known cross-site-scripting attack using UTF-7.

Cases where the author's intent is unclear

Markup where the author's intent is very unclear is often made non-conforming. Correcting these errors early makes later maintenance easier.

For example, it is unclear whether the author intended the following to be an [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) heading or an [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) heading:

<h1>Contact details</h2>

Cases that are likely to be typos

When a user makes a simple typo, it is helpful if the error can be caught early, as this can save the author a lot of debugging time. This specification therefore usually considers it an error to use element names, attribute names, and so forth, that do not match the names defined in this specification.

For example, if the author typed <capton> instead of <caption>, this would be flagged as an error and the author could correct the typo immediately.

Errors that could interfere with new syntax in the future

In order to allow the language syntax to be extended in the future, certain otherwise harmless features are disallowed.

For example, "attributes" in end tags are ignored currently, but they are invalid, in case a future change to the language makes use of that syntax feature without conflicting with already-deployed (and valid!) content.

Some authors find it helpful to be in the practice of always quoting all attributes and always including all optional tags, preferring the consistency derived from such custom over the minor benefits of terseness afforded by making use of the flexibility of the HTML syntax. To aid such authors, conformance checkers can provide modes of operation wherein such conventions are enforced.

#### 1.9.3 Restrictions on content models and on attribute values

Beyond the syntax of the language, this specification also places restrictions on how elements and attributes can be specified. These restrictions are present for similar reasons:

Errors involving content with dubious semantics

To avoid misuse of elements with defined meanings, content models are defined that restrict how elements can be nested when such nestings would be of dubious value.

For example, this specification disallows nesting a [section](http://www.w3.org/TR/html5/sections.html#the-section-element) element inside a [kbd](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element) element, since it is highly unlikely for an author to indicate that an entire section should be keyed in.

Errors that involve a conflict in expressed semantics

Similarly, to draw the author's attention to mistakes in the use of elements, clear contradictions in the semantics expressed are also considered conformance errors.

In the fragments below, for example, the semantics are nonsensical: a separator cannot simultaneously be a cell, nor can a radio button be a progress bar.

<hr role="cell">

<input type=radio role=progressbar>

Another example is the restrictions on the content models of the [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) element, which only allows [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element children. Lists by definition consist just of zero or more list items, so if a [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) element contains something other than an [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element, it's not clear what was meant.

Cases where the default styles are likely to lead to confusion

Certain elements have default styles or behaviors that make certain combinations likely to lead to confusion. Where these have equivalent alternatives without this problem, the confusing combinations are disallowed.

For example, [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) elements are rendered as block boxes, and [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) elements as inline boxes. Putting a block box in an inline box is unnecessarily confusing; since either nesting just [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) elements, or nesting just [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) elements, or nesting [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) elements inside [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) elements all serve the same purpose as nesting a [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) element in a [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) element, but only the latter involves a block box in an inline box, the latter combination is disallowed.

Another example would be the way [interactive content](http://www.w3.org/TR/html5/content-models.html#interactive-content) cannot be nested. For example, a [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) element cannot contain a [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) element. This is because the default behavior of such nesting interactive elements would be highly confusing to users. Instead of nesting these elements, they can be placed side by side.

Errors that indicate a likely misunderstanding of the specification

Sometimes, something is disallowed because allowing it would likely cause author confusion.

For example, setting the [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled) attribute to the value "false" is disallowed, because despite the appearance of meaning that the element is enabled, it in fact means that the element is disabled (what matters for implementations is the presence of the attribute, not its value).

Errors involving limits that have been imposed merely to simplify the language

Some conformance errors simplify the language that authors need to learn.

For example, the [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element's [shape](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape) attribute, despite accepting both [circ](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-circ) and [circle](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-circle) values in practice as synonyms, disallows the use of the [circ](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-circ) value, so as to simplify tutorials and other learning aids. There would be no benefit to allowing both, but it would cause extra confusion when teaching the language.

Errors that involve peculiarities of the parser

Certain elements are parsed in somewhat eccentric ways (typically for historical reasons), and their content model restrictions are intended to avoid exposing the author to these issues.

For example, a [form](http://www.w3.org/TR/html5/forms.html#the-form-element) element isn't allowed inside [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content), because when parsed as HTML, a [form](http://www.w3.org/TR/html5/forms.html#the-form-element) element's start tag will imply a [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) element's end tag. Thus, the following markup results in two [paragraphs](http://www.w3.org/TR/html5/content-models.html#paragraph), not one:

<p>Welcome. <form><label>Name:</label> <input></form>

It is parsed exactly like the following:

<p>Welcome. </p><form><label>Name:</label> <input></form>

Errors that would likely result in scripts failing in hard-to-debug ways

Some errors are intended to help prevent script problems that would be hard to debug.

This is why, for instance, it is non-conforming to have two [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) attributes with the same value. Duplicate IDs lead to the wrong element being selected, with sometimes disastrous effects whose cause is hard to determine.

Errors that waste authoring time

Some constructs are disallowed because historically they have been the cause of a lot of wasted authoring time, and by encouraging authors to avoid making them, authors can save time in future efforts.

For example, a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element's [src](http://www.w3.org/TR/html5/scripting-1.html#attr-script-src) attribute causes the element's contents to be ignored. However, this isn't obvious, especially if the element's contents appear to be executable script — which can lead to authors spending a lot of time trying to debug the inline script without realizing that it is not executing. To reduce this problem, this specification makes it non-conforming to have executable script in a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element when the [src](http://www.w3.org/TR/html5/scripting-1.html#attr-script-src) attribute is present. This means that authors who are validating their documents are less likely to waste time with this kind of mistake.

Errors that involve areas that affect authors migrating to and from XHTML

Some authors like to write files that can be interpreted as both XML and HTML with similar results. Though this practice is discouraged in general due to the myriad of subtle complications involved (especially when involving scripting, styling, or any kind of automated serialization), this specification has a few restrictions intended to at least somewhat mitigate the difficulties. This makes it easier for authors to use this as a transitionary step when migrating between HTML and XHTML.

For example, there are somewhat complicated rules surrounding the [lang](http://www.w3.org/TR/html5/elements.html#attr-lang) and [xml:lang](http://www.w3.org/TR/html5/elements.html#attr-xml-lang) attributes intended to keep the two synchronized.

Another example would be the restrictions on the values of xmlns attributes in the HTML serialization, which are intended to ensure that elements in conforming documents end up in the same namespaces whether processed as HTML or XML.

Errors that involve areas reserved for future expansion

As with the restrictions on the syntax intended to allow for new syntax in future revisions of the language, some restrictions on the content models of elements and values of attributes are intended to allow for future expansion of the HTML vocabulary.

For example, limiting the values of the [target](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target) attribute that start with an U+005F LOW LINE character (\_) to only specific predefined values allows new predefined values to be introduced at a future time without conflicting with author-defined values.

Errors that indicate a mis-use of other specifications

Certain restrictions are intended to support the restrictions made by other specifications.

For example, requiring that attributes that take media queries use only valid media queries reinforces the importance of following the conformance rules of that specification.

### 1.10 Recommended reading

## 2 Common infrastructure

### 2.1 Terminology

This specification refers to both HTML and XML attributes and IDL attributes, often in the same context. When it is not clear which is being referred to, they are referred to as content attributes for HTML and XML attributes, and IDL attributes for those defined on IDL interfaces. Similarly, the term "properties" is used for both JavaScript object properties and CSS properties. When these are ambiguous they are qualified as object properties and CSS properties respectively.

Generally, when the specification states that a feature applies to [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax) or [the XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax), it also includes the other. When a feature specifically only applies to one of the two languages, it is called out by explicitly stating that it does not apply to the other format, as in "for HTML, ... (this does not apply to XHTML)".

This specification uses the term document to refer to any use of HTML, ranging from short static documents to long essays or reports with rich multimedia, as well as to fully-fledged interactive applications.

For simplicity, terms such as shown, displayed, and visible might sometimes be used when referring to the way a document is rendered to the user. These terms are not meant to imply a visual medium; they must be considered to apply to other media in equivalent ways.

When an algorithm B says to return to another algorithm A, it implies that A called B. Upon returning to A, the implementation must continue from where it left off in calling B.

The term "transparent black" refers to the color with red, green, blue, and alpha channels all set to zero.

#### 2.1.1 Resources

The specification uses the term supported when referring to whether a user agent has an implementation capable of decoding the semantics of an external resource. A format or type is said to be *supported* if the implementation can process an external resource of that format or type without critical aspects of the resource being ignored. Whether a specific resource is *supported* can depend on what features of the resource's format are in use.

For example, a PNG image would be considered to be in a supported format if its pixel data could be decoded and rendered, even if, unbeknownst to the implementation, the image also contained animation data.

A MPEG4 video file would not be considered to be in a supported format if the compression format used was not supported, even if the implementation could determine the dimensions of the movie from the file's metadata.

What some specifications, in particular the HTTP and URI specifications, refer to as a *representation* is referred to in this specification as a resource. [[HTTP]](http://www.w3.org/TR/html5/references.html#refsHTTP) [[RFC3986]](http://www.w3.org/TR/html5/references.html#refsRFC3986)

The term MIME type is used to refer to what is sometimes called an *Internet media type* in protocol literature. The term *media type* in this specification is used to refer to the type of media intended for presentation, as used by the CSS specifications. [[RFC2046]](http://www.w3.org/TR/html5/references.html#refsRFC2046) [[MQ]](http://www.w3.org/TR/html5/references.html#refsMQ)

A string is a valid MIME type if it matches the media-type rule defined in section 3.7 "Media Types" of RFC 2616. In particular, a [valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type) may include MIME type parameters. [[HTTP]](http://www.w3.org/TR/html5/references.html#refsHTTP)

A string is a valid MIME type with no parameters if it matches the media-type rule defined in section 3.7 "Media Types" of RFC 2616, but does not contain any U+003B SEMICOLON characters (;). In other words, if it consists only of a type and subtype, with no MIME Type parameters. [[HTTP]](http://www.w3.org/TR/html5/references.html#refsHTTP)

The term HTML MIME type is used to refer to the [MIME types](http://www.w3.org/TR/html5/infrastructure.html#mime-type) [text/html](http://www.w3.org/TR/html5/iana.html#text-html) and [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed).

A resource's critical subresources are those that the resource needs to have available to be correctly processed. Which resources are considered critical or not is defined by the specification that defines the resource's format. For CSS resources, only @import rules introduce [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources); other resources, e.g. fonts or backgrounds, are not.

The term *data:* URL refers to [URLs](http://www.w3.org/TR/html5/urls.html#url) that use the data: scheme. [[RFC2397]](http://www.w3.org/TR/html5/references.html#refsRFC2397)

#### 2.1.2 XML

To ease migration from HTML to XHTML, UAs conforming to this specification will place elements in HTML in the http://www.w3.org/1999/xhtml namespace, at least for the purposes of the DOM and CSS. The term "HTML elements", when used in this specification, refers to any element in that namespace, and thus refers to both HTML and XHTML elements.

Except where otherwise stated, all elements defined or mentioned in this specification are in the http://www.w3.org/1999/xhtml namespace, and all attributes defined or mentioned in this specification have no namespace.

Attribute names are said to be XML-compatible if they match the [Name](http://www.w3.org/TR/REC-xml/#NT-Name) production defined in XML, they contain no U+003A COLON characters (:), and their first three characters are not an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "xml". [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)

The term XML MIME type is used to refer to the [MIME types](http://www.w3.org/TR/html5/infrastructure.html#mime-type) text/xml, application/xml, and any [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) whose subtype ends with the four characters "+xml". [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

#### 2.1.3 DOM trees

The root element of a *Document* object is that [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s first element child, if any. If it does not have one then the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has no root element.

The term root element, when not referring to a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object's root element, means the furthest ancestor element node of whatever node is being discussed, or the node itself if it has no ancestors. When the node is a part of the document, then the node's [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) is indeed the document's root element; however, if the node is not currently part of the document tree, the root element will be an orphaned node.

When an element's [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) is the [root element of a Document object](http://www.w3.org/TR/html5/infrastructure.html#root-element-of-a-document-object), it is said to be in a *Document*. An element is said to have been inserted into a document when its [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) changes and is now the document's [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element). Analogously, an element is said to have been removed from a document when its [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) changes from being the document's [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) to being another element.

A node's home subtree is the subtree rooted at that node's [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element). When a node is [in a Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), its [home subtree](http://www.w3.org/TR/html5/infrastructure.html#home-subtree) is that [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s tree.

The [Document](http://www.w3.org/TR/html5/infrastructure.html#document) of a [Node](http://www.w3.org/TR/html5/infrastructure.html#node) (such as an element) is the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that the [Node](http://www.w3.org/TR/html5/infrastructure.html#node)'s [ownerDocument](http://www.w3.org/TR/html5/infrastructure.html#dom-node-ownerdocument) IDL attribute returns. When a [Node](http://www.w3.org/TR/html5/infrastructure.html#node) is [in a Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document) then that [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is always the [Node](http://www.w3.org/TR/html5/infrastructure.html#node)'s [Document](http://www.w3.org/TR/html5/infrastructure.html#document), and the [Node](http://www.w3.org/TR/html5/infrastructure.html#node)'s [ownerDocument](http://www.w3.org/TR/html5/infrastructure.html#dom-node-ownerdocument) IDL attribute thus always returns that [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

The term tree order means a pre-order, depth-first traversal of DOM nodes involved (through the [parentNode](http://www.w3.org/TR/html5/infrastructure.html#dom-node-parentnode)/[childNodes](http://www.w3.org/TR/html5/infrastructure.html#dom-node-childnodes) relationship).

When it is stated that some element or attribute is ignored, or treated as some other value, or handled as if it was something else, this refers only to the processing of the node after it is in the DOM. A user agent must not mutate the DOM in such situations.

The term text node refers to any [Text](http://www.w3.org/TR/html5/infrastructure.html#text) node, including [CDATASection](http://www.w3.org/TR/html5/infrastructure.html#cdatasection) nodes; specifically, any [Node](http://www.w3.org/TR/html5/infrastructure.html#node) with node type TEXT\_NODE (3) or CDATA\_SECTION\_NODE (4). [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE)

A content attribute is said to change value only if its new value is different than its previous value; setting an attribute to a value it already has does not change it.

The term empty, when used of an attribute value, text node, or string, means that the length of the text is zero (i.e. not even containing spaces or control characters).

Nodes can be cloned, as described in the DOM Core specification. For example, the cloneNode() and importNode() methods of the [Node](http://www.w3.org/TR/html5/infrastructure.html#node) interface both clone nodes, as do a number of algorithms in this specification. Certain [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) (in particular, [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) and [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element)) apply additional requirements on how they are cloned. [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE)

#### 2.1.4 Scripting

The construction "a Foo object", where Foo is actually an interface, is sometimes used instead of the more accurate "an object implementing the interface Foo".

An IDL attribute is said to be getting when its value is being retrieved (e.g. by author script), and is said to be setting when a new value is assigned to it.

If a DOM object is said to be live, then the attributes and methods on that object must operate on the actual underlying data, not a snapshot of the data.

The terms fire and dispatch are used interchangeably in the context of events, as in the DOM Events specifications. The term trusted event is used as defined by the DOM Events specification. [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

#### 2.1.5 Plugins

The term plugin refers to a user-agent defined set of content handlers used by the user agent that can take part in the user agent's rendering of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object, but that neither act as [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) nor introduce any [Node](http://www.w3.org/TR/html5/infrastructure.html#node) objects to the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s DOM.

Typically such content handlers are provided by third parties, though a user agent can also designate built-in content handlers as plugins.

A user agent must not consider the types text/plain and application/octet-stream as having a registered [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin).

One example of a plugin would be a PDF viewer that is instantiated in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) when the user navigates to a PDF file. This would count as a plugin regardless of whether the party that implemented the PDF viewer component was the same as that which implemented the user agent itself. However, a PDF viewer application that launches separate from the user agent (as opposed to using the same interface) is not a plugin by this definition.

This specification does not define a mechanism for interacting with plugins, as it is expected to be user-agent- and platform-specific. Some UAs might opt to support a plugin mechanism such as the Netscape Plugin API; others might use remote content converters or have built-in support for certain types. Indeed, this specification doesn't require user agents to support plugins at all. [[NPAPI]](http://www.w3.org/TR/html5/references.html#refsNPAPI)

Browsers should take extreme care when interacting with external content intended for [plugins](http://www.w3.org/TR/html5/infrastructure.html#plugin). When third-party software is run with the same privileges as the user agent itself, vulnerabilities in the third-party software become as dangerous as those in the user agent.

#### 2.1.6 Character encodings

The preferred MIME name of a character encoding is the name or alias labeled as "preferred MIME name" in the IANA Character Sets registry, if there is one, or the encoding's name, if none of the aliases are so labeled. [[IANACHARSET]](http://www.w3.org/TR/html5/references.html#refsIANACHARSET)

An ASCII-compatible character encoding is a single-byte or variable-length encoding in which the bytes 0x09, 0x0A, 0x0C, 0x0D, 0x20 - 0x22, 0x26, 0x27, 0x2C - 0x3F, 0x41 - 0x5A, and 0x61 - 0x7A, ignoring bytes that are the second and later bytes of multibyte sequences, all correspond to single-byte sequences that map to the same Unicode characters as those bytes in ANSI\_X3.4-1968 (US-ASCII). [[RFC1345]](http://www.w3.org/TR/html5/references.html#refsRFC1345)

This includes such encodings as Shift\_JIS, HZ-GB-2312, and variants of ISO-2022, even though it is possible in these encodings for bytes like 0x70 to be part of longer sequences that are unrelated to their interpretation as ASCII. It excludes such encodings as UTF-7, UTF-16, GSM03.38, and EBCDIC variants.

The term Unicode character is used to mean a *Unicode scalar value* (i.e. any Unicode code point that is not a surrogate code point). [[UNICODE]](http://www.w3.org/TR/html5/references.html#refsUNICODE)

### 2.2 Conformance requirements

All diagrams, examples, and notes in this specification are non-normative, as are all sections explicitly marked non-normative. Everything else in this specification is normative.

The key words "MUST", "MUST NOT", "REQUIRED", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in the normative parts of this document are to be interpreted as described in RFC2119. For readability, these words do not appear in all uppercase letters in this specification. [[RFC2119]](http://www.w3.org/TR/html5/references.html#refsRFC2119)

Requirements phrased in the imperative as part of algorithms (such as "strip any leading space characters" or "return false and abort these steps") are to be interpreted with the meaning of the key word ("must", "should", "may", etc) used in introducing the algorithm.

Conformance requirements phrased as algorithms or specific steps may be implemented in any manner, so long as the end result is equivalent. (In particular, the algorithms defined in this specification are intended to be easy to follow, and not intended to be performant.)

#### 2.2.1 Conformance classes

This specification describes the conformance criteria for user agents (relevant to implementors) and documents (relevant to authors and authoring tool implementors).

Conforming HTML5 documents are those that comply with all the conformance criteria for documents. For readability, some of these conformance requirements are phrased as conformance requirements on authors; such requirements are implicitly requirements on documents: by definition, all documents are assumed to have had an author. (In some cases, that author may itself be a user agent — such user agents are subject to additional rules, as explained below.)

For example, if a requirement states that "authors must not use the foobar element", it would imply that documents are not allowed to contain elements named foobar.

the conformance requirements for documents include syntax (the <table> element is conforming as a child of <body>, but not as a child ot <title>), and semantics (the <table> elements denotes a multi-dimensional data table, not a piece of furniture).

There is no implied relationship between document conformance requirements and implementation conformance requirements. User agents are not free to handle non-conformant documents as they please; the processing model described in this specification applies to implementations regardless of the conformity of the input documents.

User agents fall into several (overlapping) categories with different conformance requirements.

Web browsers and other interactive user agents

Web browsers that support [the XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax) must process elements and attributes from the [HTML namespace](http://www.w3.org/TR/html5/namespaces.html#html-namespace-0) found in XML documents as described in this specification, so that users can interact with them, unless the semantics of those elements have been overridden by other specifications.

A conforming XHTML processor would, upon finding an XHTML [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element in an XML document, execute the script contained in that element. However, if the element is found within a transformation expressed in XSLT (assuming the user agent also supports XSLT), then the processor would instead treat the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element as an opaque element that forms part of the transform.

Web browsers that support [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax) must process documents labeled with an [HTML MIME type](http://www.w3.org/TR/html5/infrastructure.html#html-mime-type) as described in this specification, so that users can interact with them.

User agents that support scripting must also be conforming implementations of the IDL fragments in this specification, as described in the Web IDL specification. [[WEBIDL]](http://www.w3.org/TR/html5/references.html#refsWEBIDL)

Unless explicitly stated, specifications that override the semantics of HTML elements do not override the requirements on DOM objects representing those elements. For example, the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element in the example above would still implement the [HTMLScriptElement](http://www.w3.org/TR/html5/scripting-1.html#htmlscriptelement) interface.

Non-interactive presentation user agents

User agents that process HTML and XHTML documents purely to render non-interactive versions of them must comply to the same conformance criteria as Web browsers, except that they are exempt from requirements regarding user interaction.

Typical examples of non-interactive presentation user agents are printers (static UAs) and overhead displays (dynamic UAs). It is expected that most static non-interactive presentation user agents will also opt to [lack scripting support](http://www.w3.org/TR/html5/infrastructure.html#non-scripted).

A non-interactive but dynamic presentation UA would still execute scripts, allowing forms to be dynamically submitted, and so forth. However, since the concept of "focus" is irrelevant when the user cannot interact with the document, the UA would not need to support any of the focus-related DOM APIs.

Visual user agents that support the suggested default rendering

User agents, whether interactive or not, may be designated (possibly as a user option) as supporting the suggested default rendering defined by this specification.

User agents that are designated as supporting the suggested default rendering must implement the rules in [the rendering section](http://www.w3.org/TR/html5/rendering.html#rendering) that that section defines as the behavior that user agents are expected to implement.

User agents with no scripting support

Implementations that do not support scripting (or which have their scripting features disabled entirely) are exempt from supporting the events and DOM interfaces mentioned in this specification. For the parts of this specification that are defined in terms of an events model or in terms of the DOM, such user agents must still act as if events and the DOM were supported.

Scripting can form an integral part of an application. Web browsers that do not support scripting, or that have scripting disabled, might be unable to fully convey the author's intent.

Conformance checkers

Conformance checkers must verify that a document conforms to the applicable conformance criteria described in this specification. Automated conformance checkers are exempt from detecting errors that require interpretation of the author's intent (for example, while a document is non-conforming if the content of a [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element) element is not a quote, conformance checkers running without the input of human judgement do not have to check that [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element) elements only contain quoted material).

Conformance checkers must check that the input document conforms when parsed without a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) (meaning that no scripts are run, and that the parser's [scripting flag](http://www.w3.org/TR/html5/parsing.html#scripting-flag) is disabled), and should also check that the input document conforms when parsed with a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) in which scripts execute, and that the scripts never cause non-conforming states to occur other than transiently during script execution itself. (This is only a "SHOULD" and not a "MUST" requirement because it has been proven to be impossible. [[COMPUTABLE]](http://www.w3.org/TR/html5/references.html#refsCOMPUTABLE))

The term "HTML5 validator" can be used to refer to a conformance checker that itself conforms to the applicable requirements of this specification.

XML DTDs cannot express all the conformance requirements of this specification. Therefore, a validating XML processor and a DTD cannot constitute a conformance checker. Also, since neither of the two authoring formats defined in this specification are applications of SGML, a validating SGML system cannot constitute a conformance checker either.

To put it another way, there are three types of conformance criteria:

1. Criteria that can be expressed in a DTD.
2. Criteria that cannot be expressed by a DTD, but can still be checked by a machine.
3. Criteria that can only be checked by a human.

A conformance checker must check for the first two. A simple DTD-based validator only checks for the first class of errors and is therefore not a conforming conformance checker according to this specification.

Data mining tools

Applications and tools that process HTML and XHTML documents for reasons other than to either render the documents or check them for conformance should act in accordance with the semantics of the documents that they process.

A tool that generates [document outlines](http://www.w3.org/TR/html5/sections.html#outline) but increases the nesting level for each paragraph and does not increase the nesting level for each section would not be conforming.

Authoring tools and markup generators

Authoring tools and markup generators must generate [conforming HTML5 documents](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents). Conformance criteria that apply to authors also apply to authoring tools, where appropriate.

Authoring tools are exempt from the strict requirements of using elements only for their specified purpose, but only to the extent that authoring tools are not yet able to determine author intent. However, authoring tools must not automatically misuse elements or encourage their users to do so.

For example, it is not conforming to use an [address](http://www.w3.org/TR/html5/sections.html#the-address-element) element for arbitrary contact information; that element can only be used for marking up contact information for the author of the document or section. However, since an authoring tool is likely unable to determine the difference, an authoring tool is exempt from that requirement. This does not mean, though, that authoring tools can use [address](http://www.w3.org/TR/html5/sections.html#the-address-element) elements for any block of italics text (for instance); it just means that the authoring tool doesn't have to verify that when the user uses a tool for inserting contact information for a section, that the user really is doing that and not inserting something else instead.

In terms of conformance checking, an editor has to output documents that conform to the same extent that a conformance checker will verify.

When an authoring tool is used to edit a non-conforming document, it may preserve the conformance errors in sections of the document that were not edited during the editing session (i.e. an editing tool is allowed to round-trip erroneous content). However, an authoring tool must not claim that the output is conformant if errors have been so preserved.

Authoring tools are expected to come in two broad varieties: tools that work from structure or semantic data, and tools that work on a What-You-See-Is-What-You-Get media-specific editing basis (WYSIWYG).

The former is the preferred mechanism for tools that author HTML, since the structure in the source information can be used to make informed choices regarding which HTML elements and attributes are most appropriate.

However, WYSIWYG tools are legitimate. WYSIWYG tools should use elements they know are appropriate, and should not use elements that they do not know to be appropriate. This might in certain extreme cases mean limiting the use of flow elements to just a few elements, like [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element), [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element), and [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) and making liberal use of the [style](http://www.w3.org/TR/html5/elements.html#the-style-attribute) attribute.

All authoring tools, whether WYSIWYG or not, should make a best effort attempt at enabling users to create well-structured, semantically rich, media-independent content.

User agents may impose implementation-specific limits on otherwise unconstrained inputs, e.g. to prevent denial of service attacks, to guard against running out of memory, or to work around platform-specific limitations.

For compatibility with existing content and prior specifications, this specification describes two authoring formats: one based on XML (referred to as [the XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax)), and one using a [custom format](http://www.w3.org/TR/html5/syntax.html#writing) inspired by SGML (referred to as [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax)). Implementations must support at least one of these two formats, although supporting both is encouraged.

The language in this specification assumes that the user agent expands all entity references, and therefore does not include entity reference nodes in the DOM. If user agents do include entity reference nodes in the DOM, then user agents must handle them as if they were fully expanded when implementing this specification. For example, if a requirement talks about an element's child text nodes, then any text nodes that are children of an entity reference that is a child of that element would be used as well. Entity references to unknown entities must be treated as if they contained just an empty text node for the purposes of the algorithms defined in this specification.

Some conformance requirements are phrased as requirements on elements, attributes, methods or objects. Such requirements fall into two categories: those describing content model restrictions, and those describing implementation behavior. Those in the former category are requirements on documents and authoring tools. Those in the second category are requirements on user agents. Similarly, some conformance requirements are phrased as requirements on authors; such requirements are to be interpreted as conformance requirements on the documents that authors produce. (In other words, this specification does not distinguish between conformance criteria on authors and conformance criteria on documents.)

#### 2.2.2 Dependencies

This specification relies on several other underlying specifications.

XML

Implementations that support [the XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax) must support some version of XML, as well as its corresponding namespaces specification, because that syntax uses an XML serialization with namespaces. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML) [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS)

DOM

The Document Object Model (DOM) is a representation — a model — of a document and its content. The DOM is not just an API; the conformance criteria of HTML implementations are defined, in this specification, in terms of operations on the DOM. [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE)

Implementations must support some version of DOM Core and DOM Events, because this specification is defined in terms of the DOM, and some of the features are defined as extensions to the DOM Core interfaces. [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE) [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

In particular, the following features are defined in the DOM Core specification: [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE)

* *Attr* interface
* *CDATASection* interface
* *Comment* interface
* *DOMImplementation* interface
* *Document* interface
* *DocumentFragment* interface
* *DocumentType* interface
* *DOMException* interface
* *Element* interface
* *Node* interface
* *NodeList* interface
* *ProcessingInstruction* interface
* *Text* interface
* *createDocument()* method
* *createElement()* method
* *createElementNS()* method
* *getElementById()* method
* *insertBefore()* method
* *ownerDocument* attribute
* *childNodes* attribute
* *localName* attribute
* *parentNode* attribute
* *namespaceURI* attribute
* *tagName* attribute
* *textContent* attribute

The following features are defined in the DOM Events specification: [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

* *Event* interface
* *EventTarget* interface
* *UIEvent* interface
* *MouseEvent* interface
* *click* event
* *target* attribute

File API

This specification uses the following interfaces defined in the File API specification: [[FILEAPI]](http://www.w3.org/TR/html5/references.html#refsFILEAPI)

* Blob
* File
* FileList

Web IDL

The IDL fragments in this specification must be interpreted as required for conforming IDL fragments, as described in the Web IDL specification. [[WEBIDL]](http://www.w3.org/TR/html5/references.html#refsWEBIDL)

The terms supported property indices and supported property names are used as defined in the WebIDL specification.

Except where otherwise specified, if an IDL attribute that is a floating point number type (double) is assigned an Infinity or Not-a-Number (NaN) value, a [NOT\_SUPPORTED\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#not_supported_err) exception must be raised.

Except where otherwise specified, if a method with an argument that is a floating point number type (double) is passed an Infinity or Not-a-Number (NaN) value, a [NOT\_SUPPORTED\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#not_supported_err) exception must be raised.

Except where otherwise specified, if a method has an argument of type DOMString, or if an IDL attribute is assigned a new value of type DOMString, the user agent must convert the DOMString to a sequence of Unicode characters to obtain the string on which the algorithms in this specification are to operate. [[WEBIDL]](http://www.w3.org/TR/html5/references.html#refsWEBIDL)

JavaScript

Some parts of the language described by this specification only support JavaScript as the underlying scripting language. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

The term "JavaScript" is used to refer to ECMA262, rather than the official term ECMAScript, since the term JavaScript is more widely known. Similarly, the [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) used to refer to JavaScript in this specification is text/javascript, since that is the most commonly used type, [despite it being an officially obsoleted type](http://www.w3.org/TR/html5/introduction.html#willful-violation) according to RFC 4329. [[RFC4329]](http://www.w3.org/TR/html5/references.html#refsRFC4329)

Media Queries

Implementations must support some version of the Media Queries language. [[MQ]](http://www.w3.org/TR/html5/references.html#refsMQ)

URIs, IRIs, IDNA

Implementations must support the semantics of [URLs](http://www.w3.org/TR/html5/urls.html#url) defined in the URI and IRI specifications, as well as the semantics of IDNA domain names defined in the Internationalizing Domain Names in Applications (IDNA) specification. [[RFC3986]](http://www.w3.org/TR/html5/references.html#refsRFC3986) [[RFC3987]](http://www.w3.org/TR/html5/references.html#refsRFC3987) [[RFC3490]](http://www.w3.org/TR/html5/references.html#refsRFC3490)

CSS modules

While support for CSS as a whole is not required of implementations of this specification (though it is encouraged, at least for Web browsers), some features are defined in terms of specific CSS requirements.

In particular, some features require that a string be parsed as a CSS <color> value. When parsing a CSS value, user agents are required by the CSS specifications to apply some error handling rules. These apply to this specification also. [[CSSCOLOR]](http://www.w3.org/TR/html5/references.html#refsCSSCOLOR) [[CSS]](http://www.w3.org/TR/html5/references.html#refsCSS)

For example, user agents are required to close all open constructs upon finding the end of a style sheet unexpectedly. Thus, when parsing the string "rgb(0,0,0" (with a missing close-parenthesis) for a color value, the close parenthesis is implied by this error handling rule, and a value is obtained (the color 'black'). However, the similar construct "rgb(0,0," (with both a missing parenthesis and a missing "blue" value) cannot be parsed, as closing the open construct does not result in a viable value.

This specification does not require support of any particular network protocol, style sheet language, scripting language, or any of the DOM specifications beyond those described above. However, the language described by this specification is biased towards CSS as the styling language, JavaScript as the scripting language, and HTTP as the network protocol, and several features assume that those languages and protocols are in use.

This specification might have certain additional requirements on character encodings, image formats, audio formats, and video formats in the respective sections.

#### 2.2.3 Extensibility

HTML has a wide number of extensibility mechanisms that can be used for adding semantics in a safe manner:

* Authors can use the [class](http://www.w3.org/TR/html5/elements.html#classes) attribute to extend elements, effectively creating their own elements, while using the most applicable existing "real" HTML element, so that browsers and other tools that don't know of the extension can still support it somewhat well. This is the tack used by Microformats, for example.
* Authors can include data for inline client-side scripts or server-side site-wide scripts to process using the [data-\*=""](http://www.w3.org/TR/html5/elements.html#attr-data) attributes. These are guaranteed to never be touched by browsers, and allow scripts to include data on HTML elements that scripts can then look for and process.
* Authors can use the [<meta name="" content="">](http://www.w3.org/TR/html5/semantics.html#the-meta-element) mechanism to include page-wide metadata by registering [extensions to the predefined set of metadata names](http://www.w3.org/TR/html5/semantics.html#concept-meta-extensions).
* Authors can use the [rel=""](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel) mechanism to annotate links with specific meanings by registering [extensions to the predefined set of link types](http://www.w3.org/TR/html5/links.html#concept-rel-extensions). This is also used by Microformats.
* Authors can embed raw data using the [<script type="">](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) mechanism with a custom type, for further handling by inline or server-side scripts.
* Authors can create [plugins](http://www.w3.org/TR/html5/infrastructure.html#plugin) and invoke them using the [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) element. This is how Flash works.
* Authors can extend APIs using the JavaScript prototyping mechanism. This is widely used by script libraries, for instance.

Vendor-specific proprietary user agent extensions to this specification are strongly discouraged. Documents must not use such extensions, as doing so reduces interoperability and fragments the user base, allowing only users of specific user agents to access the content in question.

If such extensions are nonetheless needed, e.g. for experimental purposes, then vendors are strongly urged to use one of the following extension mechanisms:

For markup-level features that can be limited to the XML serialization and need not be supported in the HTML serialization, vendors should use the namespace mechanism to define custom namespaces in which the non-standard elements and attributes are supported.

For markup-level features that are intended for use with [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax), extensions should be limited to new attributes of the form "x-vendor-feature", where vendor is a short string that identifies the vendor responsible for the extension, and feature is the name of the feature. New element names should not be created. Using attributes for such extensions exclusively allows extensions from multiple vendors to co-exist on the same element, which would not be possible with elements. Using the "x-vendor-feature" form allows extensions to be made without risk of conflicting with future additions to the specification.

For instance, a browser named "FerretBrowser" could use "ferret" as a vendor prefix, while a browser named "Mellblom Browser" could use "mb". If both of these browsers invented extensions that turned elements into scratch-and-sniff areas, an author experimenting with these features could write:

<p>This smells of lemons!

<span x-ferret-smellovision x-ferret-smellcode="LEM01"

x-mb-outputsmell x-mb-smell="lemon juice"></span></p>

Attribute names beginning with the two characters "x-" are reserved for user agent use and are guaranteed to never be formally added to the HTML language. For flexibility, attributes names containing underscores (the U+005F LOW LINE character) are also reserved for experimental purposes and are guaranteed to never be formally added to the HTML language.

Pages that use such attributes are by definition non-conforming.

For DOM extensions, e.g. new methods and IDL attributes, the new members should be prefixed by vendor-specific strings to prevent clashes with future versions of this specification.

For events, experimental event names should be prefixed with vendor-specific strings.

For example, if a user agent called "Pleasold" were to add an event to indicate when the user is going up in an elevator, it could use the prefix "pleasold" and thus name the event "pleasoldgoingup", possibly with an event handler attribute named "onpleasoldgoingup".

All extensions must be defined so that the use of extensions neither contradicts nor causes the non-conformance of functionality defined in the specification.

For example, while strongly discouraged from doing so, an implementation "Foo Browser" could add a new IDL attribute "fooTypeTime" to a control's DOM interface that returned the time it took the user to select the current value of a control (say). On the other hand, defining a new control that appears in a form's [elements](http://www.w3.org/TR/html5/forms.html#dom-form-elements) array would be in violation of the above requirement, as it would violate the definition of [elements](http://www.w3.org/TR/html5/forms.html#dom-form-elements) given in this specification.

When adding new [reflecting](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) IDL attributes corresponding to content attributes of the form "x-vendor-feature", the IDL attribute should be named "vendorFeature" (i.e. the "x" is dropped from the IDL attribute's name).

When vendor-neutral extensions to this specification are needed, either this specification can be updated accordingly, or an extension specification can be written that overrides the requirements in this specification. When someone applying this specification to their activities decides that they will recognize the requirements of such an extension specification, it becomes an applicable specification.

The conformance terminology for documents depends on the nature of the changes introduced by such applicable specificactions, and on the content and intended interpretation of the document. Applicable specifications MAY define new document content (e.g. a foobar element), MAY prohibit certain otherwise conforming content (e.g. prohibit use of <table>s), or MAY change the semantics, DOM mappings, or other processing rules for content defined in this specification. Whether a document is or is not a [conforming HTML5 document](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents) does not depend on the use of applicable specifications: if the syntax and semantics of a given [conforming HTML5 document](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents) document is unchanged by the use of applicable specification(s), then that document remains a [conforming HTML5 document](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents). If the semantics or processing of a given (otherwise conforming) document is changed by use of applicable specification(s), then it is not a [conforming HTML5 document](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents). For such cases, the applicable specifications SHOULD define conformance terminology.

As a suggested but not required convention, such specifications might define conformance terminology such as: "Conforming HTML5+XXX document", where XXX is a short name for the applicable specification. (Example: "Conforming HTML5+AutomotiveExtensions document").

a consequence of the rule given above is that certain syntactically correct HTML5 documents may not be [conforming HTML5 documents](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents) in the presence of applicable specifications. (Example: the applicable specification defines <table> to be a piece of furniture — a document written to that specification and containing a <table> element is NOT a [conforming HTML5 document](http://www.w3.org/TR/html5/infrastructure.html#conforming-html5-documents), even if the element happens to be syntactically correct HTML5.)

User agents must treat elements and attributes that they do not understand as semantically neutral; leaving them in the DOM (for DOM processors), and styling them according to CSS (for CSS processors), but not inferring any meaning from them.

When support for a feature is disabled (e.g. as an emergency measure to mitigate a security problem, or to aid in development, or for performance reasons), user agents must act as if they had no support for the feature whatsoever, and as if the feature was not mentioned in this specification. For example, if a particular feature is accessed via an attribute in a Web IDL interface, the attribute itself would be omitted from the objects that implement that interface — leaving the attribute on the object but making it return null or throw an exception is insufficient.

### 2.3 Case-sensitivity and string comparison

Comparing two strings in a case-sensitive manner means comparing them exactly, code point for code point.

Comparing two strings in an ASCII case-insensitive manner means comparing them exactly, code point for code point, except that the characters in the range U+0041 to U+005A (i.e. LATIN CAPITAL LETTER A to LATIN CAPITAL LETTER Z) and the corresponding characters in the range U+0061 to U+007A (i.e. LATIN SMALL LETTER A to LATIN SMALL LETTER Z) are considered to also match.

Comparing two strings in a compatibility caseless manner means using the Unicode *compatibility caseless match* operation to compare the two strings. [[UNICODE]](http://www.w3.org/TR/html5/references.html#refsUNICODE)

Except where otherwise stated, string comparisons must be performed in a [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive) manner.

Converting a string to ASCII uppercase means replacing all characters in the range U+0061 to U+007A (i.e. LATIN SMALL LETTER A to LATIN SMALL LETTER Z) with the corresponding characters in the range U+0041 to U+005A (i.e. LATIN CAPITAL LETTER A to LATIN CAPITAL LETTER Z).

Converting a string to ASCII lowercase means replacing all characters in the range U+0041 to U+005A (i.e. LATIN CAPITAL LETTER A to LATIN CAPITAL LETTER Z) with the corresponding characters in the range U+0061 to U+007A (i.e. LATIN SMALL LETTER A to LATIN SMALL LETTER Z).

A string pattern is a prefix match for a string s when pattern is not longer than s and truncating s to pattern's length leaves the two strings as matches of each other.

### 2.4 UTF-8

When a user agent is required to decode a byte string as UTF-8, with error handling, it means that the byte stream must be converted to a Unicode string by interpreting it as UTF-8, except that any errors must be handled as described in the following list. Bytes in the following list are represented in hexadecimal. [[RFC3629]](http://www.w3.org/TR/html5/references.html#refsRFC3629)

One byte in the range FE to FF

[Overlong forms](http://www.w3.org/TR/html5/infrastructure.html#overlong-form) (e.g. F0 80 80 A0)

One byte in the range C0 to C1, followed by one byte in the range 80 to BF

One byte in the range F0 to F4, followed by three bytes in the range 80 to BF that represent a code point above U+10FFFF

One byte in the range F5 to F7, followed by three bytes in the range 80 to BF

One byte in the range F8 to FB, followed by four bytes in the range 80 to BF

One byte in the range FC to FD, followed by five bytes in the range 80 to BF

One byte in the range C0 to FD that is not followed by a byte in the range 80 to BF

One byte in the range E0 to FD, followed by a byte in the range 80 to BF that is not followed by a byte in the range 80 to BF

One byte in the range F0 to FD, followed by two bytes in the range 80 to BF, the last of which is not followed by a byte in the range 80 to BF

One byte in the range F8 to FD, followed by three bytes in the range 80 to BF, the last of which is not followed by a byte in the range 80 to BF

One byte in the range FC to FD, followed by four bytes in the range 80 to BF, the last of which is not followed by a byte in the range 80 to BF

Any byte sequence that represents a code point in the range U+D800 to U+DFFF

The whole matched sequence must be replaced by a single U+FFFD REPLACEMENT CHARACTER.

One byte in the range 80 to BF not preceded by a byte in the range 80 to FD

One byte in the range 80 to BF preceded by a byte that is part of a complete UTF-8 sequence that does not include this byte

One byte in the range 80 to BF preceded by a byte that is part of a sequence that has been replaced by a U+FFFD REPLACEMENT CHARACTER, either alone or as part of a sequence

Each such byte must be replaced with a U+FFFD REPLACEMENT CHARACTER.

For the purposes of the above requirements, an overlong form in UTF-8 is a sequence that encodes a code point using more bytes than the minimum needed to encode that code point in UTF-8.

For example, the byte string "41 98 BA 42 E2 98 43 E2 98 BA E2 98" would be converted to the string "A��B�C☺�".

## 3 Semantics, structure, and APIs of HTML documents

### 3.1 Documents

Every XML and HTML document in an HTML UA is represented by a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object. [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE)

The document's address is an [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) that is set when the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is created. The document's current address is an [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) that can change during the lifetime of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document), for example when the user [navigates](http://www.w3.org/TR/html5/history.html#navigate) to a [fragment identifier](http://www.w3.org/TR/html5/history.html#scroll-to-fragid) on the page or when the [pushState()](http://www.w3.org/TR/html5/history.html#dom-history-pushstate) method is called with a new [URL](http://www.w3.org/TR/html5/urls.html#url). [The document's current address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) must be set to [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) when the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is created.

Interactive user agents typically expose [the document's current address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) in their user interface.

When a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is created by a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) using the [createDocument()](http://www.w3.org/TR/html5/infrastructure.html#dom-domimplementation-createdocument) or [createHTMLDocument()](http://www.w3.org/TR/html5/dom.html#dom-domhtmlimplementation-createhtmldocument) APIs, [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) is the same as [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) of the [script's document](http://www.w3.org/TR/html5/webappapis.html#script-s-document).

[Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects are assumed to be XML documents unless they are flagged as being HTML documents when they are created. Whether a document is an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) or an [XML document](http://www.w3.org/TR/html5/dom.html#xml-documents) affects the behavior of certain APIs and the case-sensitivity of some selectors.

Each [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object has a reload override flag that is originally unset. The flag is set by the [document.open()](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-open) and [document.write()](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-open) methods in certain situations. When the flag is set, the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) also has a reload override buffer which is a Unicode string that is used as the source of the document when it is reloaded.

When the user agent is to perform an overridden reload, it must act as follows:

1. Let source be the value of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document)'s [reload override buffer](http://www.w3.org/TR/html5/dom.html#reload-override-buffer).
2. [Navigate](http://www.w3.org/TR/html5/history.html#navigate) the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to a resource whose source is source, with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled). When the [navigate](http://www.w3.org/TR/html5/history.html#navigate) algorithm creates a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object for this purpose, set that [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [reload override flag](http://www.w3.org/TR/html5/dom.html#reload-override-flag) and set its [reload override buffer](http://www.w3.org/TR/html5/dom.html#reload-override-buffer) to source.

#### 3.1.1 Documents in the DOM

All [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects (in user agents implementing this specification) must also implement the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface, available using binding-specific methods. (This is the case whether or not the document in question is an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) or indeed whether it contains any [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) at all.) [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects must also implement the document-level interface of any other namespaces that the UA supports.

For example, if an HTML implementation also supports SVG, then the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object implements both [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) and SVGDocument.

Because the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface is now obtained using binding-specific casting methods instead of simply being the primary interface of the document object, it is no longer defined as inheriting from [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

[OverrideBuiltins]

interface HTMLDocument {

// [resource metadata management](http://www.w3.org/TR/html5/dom.html#resource-metadata-management)

[PutForwards=[href](http://www.w3.org/TR/html5/history.html#dom-location-href)] readonly attribute [Location](http://www.w3.org/TR/html5/history.html#location) [location](http://www.w3.org/TR/html5/history.html#dom-document-location);

readonly attribute DOMString [URL](http://www.w3.org/TR/html5/dom.html#dom-document-url);

attribute DOMString [domain](http://www.w3.org/TR/html5/origin-0.html#dom-document-domain);

readonly attribute DOMString [referrer](http://www.w3.org/TR/html5/dom.html#dom-document-referrer);

attribute DOMString [cookie](http://www.w3.org/TR/html5/dom.html#dom-document-cookie);

readonly attribute DOMString [lastModified](http://www.w3.org/TR/html5/dom.html#dom-document-lastmodified);

readonly attribute DOMString [compatMode](http://www.w3.org/TR/html5/dom.html#dom-document-compatmode);

attribute DOMString [charset](http://www.w3.org/TR/html5/dom.html#dom-document-charset);

readonly attribute DOMString [characterSet](http://www.w3.org/TR/html5/dom.html#dom-document-characterset);

readonly attribute DOMString [defaultCharset](http://www.w3.org/TR/html5/dom.html#dom-document-defaultcharset);

readonly attribute DOMString [readyState](http://www.w3.org/TR/html5/dom.html#dom-document-readystate);

// [DOM tree accessors](http://www.w3.org/TR/html5/dom.html#dom-tree-accessors)

[getter](http://www.w3.org/TR/html5/dom.html#dom-document-nameditem) any (in DOMString name);

attribute DOMString [title](http://www.w3.org/TR/html5/dom.html#document.title);

attribute DOMString [dir](http://www.w3.org/TR/html5/elements.html#dom-document-dir);

attribute [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) [body](http://www.w3.org/TR/html5/dom.html#dom-document-body);

readonly attribute [HTMLHeadElement](http://www.w3.org/TR/html5/semantics.html#htmlheadelement) [head](http://www.w3.org/TR/html5/dom.html#dom-document-head);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [images](http://www.w3.org/TR/html5/dom.html#dom-document-images);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [embeds](http://www.w3.org/TR/html5/dom.html#dom-document-embeds);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [plugins](http://www.w3.org/TR/html5/dom.html#dom-document-plugins);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [links](http://www.w3.org/TR/html5/dom.html#dom-document-links);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [forms](http://www.w3.org/TR/html5/dom.html#dom-document-forms);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [scripts](http://www.w3.org/TR/html5/dom.html#dom-document-scripts);

NodeList [getElementsByName](http://www.w3.org/TR/html5/dom.html#dom-document-getelementsbyname)(in DOMString elementName);

NodeList [getElementsByClassName](http://www.w3.org/TR/html5/dom.html#dom-document-getelementsbyclassname)(in DOMString classNames);

// [dynamic markup insertion](http://www.w3.org/TR/html5/apis-in-html-documents.html#dynamic-markup-insertion)

attribute DOMString [innerHTML](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-innerhtml);

[HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) [open](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-open)(in optional DOMString type, in optional DOMString replace);

[WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [open](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-open)(in DOMString url, in DOMString name, in DOMString features, in optional boolean replace);

void [close](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-close)();

void [write](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-write)(in DOMString... text);

void [writeln](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-writeln)(in DOMString... text);

// [user interaction](http://www.w3.org/TR/html5/editing.html#editing)

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [defaultView](http://www.w3.org/TR/html5/browsers.html#dom-document-defaultview);

readonly attribute [Element](http://www.w3.org/TR/html5/infrastructure.html#element) [activeElement](http://www.w3.org/TR/html5/editing.html#dom-document-activeelement);

boolean [hasFocus](http://www.w3.org/TR/html5/editing.html#dom-document-hasfocus)();

attribute DOMString [designMode](http://www.w3.org/TR/html5/editing.html#designMode);

boolean [execCommand](http://www.w3.org/TR/html5/dnd.html#execCommand)(in DOMString commandId);

boolean [execCommand](http://www.w3.org/TR/html5/dnd.html#execCommand)(in DOMString commandId, in boolean showUI);

boolean [execCommand](http://www.w3.org/TR/html5/dnd.html#execCommand)(in DOMString commandId, in boolean showUI, in DOMString value);

boolean [queryCommandEnabled](http://www.w3.org/TR/html5/dnd.html#dom-document-querycommandenabled)(in DOMString commandId);

boolean [queryCommandIndeterm](http://www.w3.org/TR/html5/dnd.html#dom-document-querycommandindeterm)(in DOMString commandId);

boolean [queryCommandState](http://www.w3.org/TR/html5/dnd.html#dom-document-querycommandstate)(in DOMString commandId);

boolean [queryCommandSupported](http://www.w3.org/TR/html5/dnd.html#dom-document-querycommandsupported)(in DOMString commandId);

DOMString [queryCommandValue](http://www.w3.org/TR/html5/dnd.html#dom-document-querycommandvalue)(in DOMString commandId);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [commands](http://www.w3.org/TR/html5/commands.html#dom-document-commands);

// [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes)

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onabort](http://www.w3.org/TR/html5/webappapis.html#handler-onabort);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-onblur);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncanplay](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplay);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncanplaythrough](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplaythrough);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onchange](http://www.w3.org/TR/html5/webappapis.html#handler-onchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onclick](http://www.w3.org/TR/html5/webappapis.html#handler-onclick);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncontextmenu](http://www.w3.org/TR/html5/webappapis.html#handler-oncontextmenu);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncuechange](http://www.w3.org/TR/html5/webappapis.html#handler-oncuechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondblclick](http://www.w3.org/TR/html5/webappapis.html#handler-ondblclick);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondrag](http://www.w3.org/TR/html5/webappapis.html#handler-ondrag);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragend](http://www.w3.org/TR/html5/webappapis.html#handler-ondragend);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragenter](http://www.w3.org/TR/html5/webappapis.html#handler-ondragenter);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragleave](http://www.w3.org/TR/html5/webappapis.html#handler-ondragleave);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragover](http://www.w3.org/TR/html5/webappapis.html#handler-ondragover);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragstart](http://www.w3.org/TR/html5/webappapis.html#handler-ondragstart);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondrop](http://www.w3.org/TR/html5/webappapis.html#handler-ondrop);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondurationchange](http://www.w3.org/TR/html5/webappapis.html#handler-ondurationchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onemptied](http://www.w3.org/TR/html5/webappapis.html#handler-onemptied);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onended](http://www.w3.org/TR/html5/webappapis.html#handler-onended);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-onerror);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-onfocus);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oninput](http://www.w3.org/TR/html5/webappapis.html#handler-oninput);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oninvalid](http://www.w3.org/TR/html5/webappapis.html#handler-oninvalid);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeydown](http://www.w3.org/TR/html5/webappapis.html#handler-onkeydown);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeypress](http://www.w3.org/TR/html5/webappapis.html#handler-onkeypress);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeyup](http://www.w3.org/TR/html5/webappapis.html#handler-onkeyup);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onload](http://www.w3.org/TR/html5/webappapis.html#handler-onload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadeddata](http://www.w3.org/TR/html5/webappapis.html#handler-onloadeddata);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadedmetadata](http://www.w3.org/TR/html5/webappapis.html#handler-onloadedmetadata);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadstart](http://www.w3.org/TR/html5/webappapis.html#handler-onloadstart);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousedown](http://www.w3.org/TR/html5/webappapis.html#handler-onmousedown);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousemove](http://www.w3.org/TR/html5/webappapis.html#handler-onmousemove);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseout](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseout);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseover](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseover);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseup](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseup);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousewheel](http://www.w3.org/TR/html5/webappapis.html#handler-onmousewheel);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpause](http://www.w3.org/TR/html5/webappapis.html#handler-onpause);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onplay](http://www.w3.org/TR/html5/webappapis.html#handler-onplay);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onplaying](http://www.w3.org/TR/html5/webappapis.html#handler-onplaying);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onprogress](http://www.w3.org/TR/html5/webappapis.html#handler-onprogress);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onratechange](http://www.w3.org/TR/html5/webappapis.html#handler-onratechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onreadystatechange](http://www.w3.org/TR/html5/webappapis.html#handler-onreadystatechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onreset](http://www.w3.org/TR/html5/webappapis.html#handler-onreset);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-onscroll);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onseeked](http://www.w3.org/TR/html5/webappapis.html#handler-onseeked);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onseeking](http://www.w3.org/TR/html5/webappapis.html#handler-onseeking);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onselect](http://www.w3.org/TR/html5/webappapis.html#handler-onselect);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onshow](http://www.w3.org/TR/html5/webappapis.html#handler-onshow);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onstalled](http://www.w3.org/TR/html5/webappapis.html#handler-onstalled);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onsubmit](http://www.w3.org/TR/html5/webappapis.html#handler-onsubmit);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onsuspend](http://www.w3.org/TR/html5/webappapis.html#handler-onsuspend);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ontimeupdate](http://www.w3.org/TR/html5/webappapis.html#handler-ontimeupdate);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onvolumechange](http://www.w3.org/TR/html5/webappapis.html#handler-onvolumechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onwaiting](http://www.w3.org/TR/html5/webappapis.html#handler-onwaiting);

};

[Document](http://www.w3.org/TR/html5/infrastructure.html#document) implements [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument);

Since the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface holds methods and attributes related to a number of disparate features, the members of this interface are described in various different sections.

#### 3.1.2 Security

User agents must raise a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception whenever any of the members of an [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) object are accessed by scripts whose [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) is not the [same](http://www.w3.org/TR/html5/origin-0.html#same-origin) as the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin).

#### 3.1.3 Resource metadata management

document . [URL](http://www.w3.org/TR/html5/dom.html#dom-document-url)

Returns [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address).

document . [referrer](http://www.w3.org/TR/html5/dom.html#dom-document-referrer)

Returns [the address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) from which the user navigated to this one, unless it was blocked or there was no such document, in which case it returns the empty string.

The [noreferrer](http://www.w3.org/TR/html5/links.html#link-type-noreferrer) link type can be used to block the referrer.

The *URL* attribute must return [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address).

The *referrer* attribute must return either the [current address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context) at the time the navigation was started (that is, the page which [navigated](http://www.w3.org/TR/html5/history.html#navigate) the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to the current document), with any [<fragment>](http://www.w3.org/TR/html5/urls.html#url-fragment) component removed; or the empty string if there is no such originating page, or if the UA has been configured not to report referrers in this case, or if the navigation was initiated for a [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) with a [noreferrer](http://www.w3.org/TR/html5/links.html#link-type-noreferrer) keyword.

In the case of HTTP, the [referrer](http://www.w3.org/TR/html5/dom.html#dom-document-referrer) IDL attribute will match the Referer (sic) header that was sent when [fetching](http://www.w3.org/TR/html5/fetching-resources.html#fetch) the current page.

Typically user agents are configured to not report referrers in the case where the referrer uses an encrypted protocol and the current page does not (e.g. when navigating from an https: page to an http: page).

document . [cookie](http://www.w3.org/TR/html5/dom.html#dom-document-cookie) [ = value ]

Returns the HTTP cookies that apply to the [Document](http://www.w3.org/TR/html5/infrastructure.html#document). If there are no cookies or cookies can't be applied to this resource, the empty string will be returned.

Can be set, to add a new cookie to the element's set of HTTP cookies.

If the contents are [sandboxed into a unique origin](http://www.w3.org/TR/html5/the-iframe-element.html#sandboxed-origin-browsing-context-flag) (in an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) with the [sandbox](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox) attribute) or the resource was labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed), a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception will be thrown on getting and setting.

The *cookie* attribute represents the cookies of the resource from which the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) was created.

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object that falls into one of the following conditions is a cookie-free *Document* object:

* A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that has no [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context).
* A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) whose [address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) does not use a server-based naming authority.

On getting, if the document is a [cookie-free Document object](http://www.w3.org/TR/html5/dom.html#cookie-free-document-object), then the user agent must return the empty string. Otherwise, if the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [origin](http://www.w3.org/TR/html5/origin-0.html#origin) is not a scheme/host/port tuple, the user agent must raise a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception. Otherwise, the user agent must first [obtain the storage mutex](http://www.w3.org/TR/html5/webappapis.html#obtain-the-storage-mutex) and then return the cookie-string for [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) for a "non-HTTP" API, [decoded as UTF-8, with error handling](http://www.w3.org/TR/html5/infrastructure.html#decoded-as-utf-8-with-error-handling). [[COOKIES]](http://www.w3.org/TR/html5/references.html#refsCOOKIES)

On setting, if the document is a [cookie-free Document object](http://www.w3.org/TR/html5/dom.html#cookie-free-document-object), then the user agent must do nothing. Otherwise, if the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [origin](http://www.w3.org/TR/html5/origin-0.html#origin) is not a scheme/host/port tuple, the user agent must raise a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception. Otherwise, the user agent must [obtain the storage mutex](http://www.w3.org/TR/html5/webappapis.html#obtain-the-storage-mutex) and then act as it would when receiving a set-cookie-string for [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) via a "non-HTTP" API, consisting of the new value encoded as UTF-8. [[COOKIES]](http://www.w3.org/TR/html5/references.html#refsCOOKIES) [[RFC3629]](http://www.w3.org/TR/html5/references.html#refsRFC3629)

Since the [cookie](http://www.w3.org/TR/html5/dom.html#dom-document-cookie) attribute is accessible across frames, the path restrictions on cookies are only a tool to help manage which cookies are sent to which parts of the site, and are not in any way a security feature.

document . [lastModified](http://www.w3.org/TR/html5/dom.html#dom-document-lastmodified)

Returns the date of the last modification to the document, as reported by the server, in the form "MM/DD/YYYY hh:mm:ss", in the user's local time zone.

If the last modification date is not known, the current time is returned instead.

The *lastModified* attribute, on getting, must return the date and time of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s source file's last modification, in the user's local time zone, in the following format:

1. The month component of the date.
2. A U+002F SOLIDUS character (/).
3. The day component of the date.
4. A U+002F SOLIDUS character (/).
5. The year component of the date.
6. A U+0020 SPACE character.
7. The hours component of the time.
8. A U+003A COLON character (:).
9. The minutes component of the time.
10. A U+003A COLON character (:).
11. The seconds component of the time.

All the numeric components above, other than the year, must be given as two digits in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9) representing the number in base ten, zero-padded if necessary. The year must be given as the shortest possible string of four or more digits in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9) representing the number in base ten, zero-padded if necessary.

The [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s source file's last modification date and time must be derived from relevant features of the networking protocols used, e.g. from the value of the HTTP Last-Modified header of the document, or from metadata in the file system for local files. If the last modification date and time are not known, the attribute must return the current date and time in the above format.

document . [compatMode](http://www.w3.org/TR/html5/dom.html#dom-document-compatmode)

In a conforming document, returns the string "CSS1Compat". (In [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode) documents, returns the string "BackCompat", but a conforming document can never trigger [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode).)

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is always set to one of three modes: no-quirks mode, the default; quirks mode, used typically for legacy documents; and limited-quirks mode, also known as "almost standards" mode. The mode is only ever changed from the default by the [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser), based on the presence, absence, or value of the DOCTYPE string.

The *compatMode* IDL attribute must return the literal string "CSS1Compat" unless the document has been set to [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode) by the [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser), in which case it must instead return the literal string "BackCompat".

document . [charset](http://www.w3.org/TR/html5/dom.html#dom-document-charset) [ = value ]

Returns the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding).

Can be set, to dynamically change the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding).

New values that are not IANA-registered aliases supported by the user agent are ignored.

document . [characterSet](http://www.w3.org/TR/html5/dom.html#dom-document-characterset)

Returns the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding).

document . [defaultCharset](http://www.w3.org/TR/html5/dom.html#dom-document-defaultcharset)

Returns what might be the user agent's default character encoding. (The user agent might return another character encoding altogether, e.g. to protect the user's privacy, or if the user agent doesn't use a single default encoding.)

Documents have an associated character encoding. When a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object is created, the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding) must be initialized to UTF-16. Various algorithms during page loading affect this value, as does the [charset](http://www.w3.org/TR/html5/dom.html#dom-document-charset) setter. [[IANACHARSET]](http://www.w3.org/TR/html5/references.html#refsIANACHARSET)

The *charset* IDL attribute must, on getting, return the [preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding). On setting, if the new value is an IANA-registered alias for a character encoding supported by the user agent, the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding) must be set to that character encoding. (Otherwise, nothing happens.)

The *characterSet* IDL attribute must, on getting, return the [preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding).

The *defaultCharset* IDL attribute must, on getting, return the [preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of a character encoding, possibly the user's default encoding, or an encoding associated with the user's current geographical location, or any arbitrary encoding name.

document . [readyState](http://www.w3.org/TR/html5/dom.html#dom-document-readystate)

Returns "loading" while the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is loading, "interactive" once it is finished parsing but still loading sub-resources, and "complete" once it has loaded.

The [readystatechange](http://www.w3.org/TR/html5/dom.html#event-readystatechange) event fires on the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object when this value changes.

Each document has a current document readiness. When a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object is created, it must have its [current document readiness](http://www.w3.org/TR/html5/dom.html#current-document-readiness) set to the string "loading" if the document is associated with an [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) or an [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser), or to the string "complete" otherwise. Various algorithms during page loading affect this value. When the value is set, the user agent must [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named *readystatechange* at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object.

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is said to have an active parser if it is associated with an [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) or an [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) that has not yet been [stopped](http://www.w3.org/TR/html5/the-end.html#stop-parsing) or [aborted](http://www.w3.org/TR/html5/the-end.html#abort-a-parser).

The *readyState* IDL attribute must, on getting, return the [current document readiness](http://www.w3.org/TR/html5/dom.html#current-document-readiness).

#### 3.1.4 DOM tree accessors

The *html* element of a document is the document's root element, if there is one and it's an [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element, or null otherwise.

document . [head](http://www.w3.org/TR/html5/dom.html#dom-document-head)

Returns [the head element](http://www.w3.org/TR/html5/dom.html#the-head-element-0).

The *head* element of a document is the first [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element that is a child of [the html element](http://www.w3.org/TR/html5/dom.html#the-html-element-0), if there is one, or null otherwise.

The *head* attribute, on getting, must return [the head element](http://www.w3.org/TR/html5/dom.html#the-head-element-0) of the document (a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element or null).

document . [title](http://www.w3.org/TR/html5/dom.html#document.title) [ = value ]

Returns the document's title, as given by [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0).

Can be set, to update the document's title. If there is no [head element](http://www.w3.org/TR/html5/dom.html#the-head-element-0), the new value is ignored.

In SVG documents, the SVGDocument interface's title attribute takes precedence.

The *title* element of a document is the first [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element in the document (in tree order), if there is one, or null otherwise.

The *title* attribute must, on getting, run the following algorithm:

1. If the [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) is an [svg](http://www.w3.org/TR/html5/the-map-element.html#svg) element in the "http://www.w3.org/2000/svg" namespace, and the user agent supports SVG, then return the value that would have been returned by the IDL attribute of the same name on the SVGDocument interface. [[SVG]](http://www.w3.org/TR/html5/references.html#refsSVG)
2. Otherwise, let value be a concatenation of the data of all the child [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node) of [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0), in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order), or the empty string if [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0) is null.
3. Replace any sequence of one or more consecutive [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) in value with a single U+0020 SPACE character.
4. Remove any leading or trailing [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) in value.
5. Return value.

On setting, the following algorithm must be run. Mutation events must be fired as appropriate.

1. If the [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element) is an [svg](http://www.w3.org/TR/html5/the-map-element.html#svg) element in the "http://www.w3.org/2000/svg" namespace, and the user agent supports SVG, then the setter must defer to the setter for the IDL attribute of the same name on the SVGDocument interface (if it is readonly, then this will raise an exception). Stop the algorithm here. [[SVG]](http://www.w3.org/TR/html5/references.html#refsSVG)
2. If [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0) is null and [the head element](http://www.w3.org/TR/html5/dom.html#the-head-element-0) is null, then the attribute must do nothing. Stop the algorithm here.
3. If [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0) is null, then a new [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element must be created and appended to [the head element](http://www.w3.org/TR/html5/dom.html#the-head-element-0). Let element be that element. Otherwise, let element be [the title element](http://www.w3.org/TR/html5/dom.html#the-title-element-0).
4. The children of element (if any) must all be removed.
5. A single [Text](http://www.w3.org/TR/html5/infrastructure.html#text) node whose data is the new value being assigned must be appended to element.

The [title](http://www.w3.org/TR/html5/dom.html#document.title) attribute on the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface should shadow the attribute of the same name on the SVGDocument interface when the user agent supports both HTML and SVG. [[SVG]](http://www.w3.org/TR/html5/references.html#refsSVG)

document . [body](http://www.w3.org/TR/html5/dom.html#dom-document-body) [ = value ]

Returns [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0).

Can be set, to replace [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0).

If the new value is not a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) or [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, this will throw a [HIERARCHY\_REQUEST\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#hierarchy_request_err) exception.

The body element of a document is the first child of [the html element](http://www.w3.org/TR/html5/dom.html#the-html-element-0) that is either a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element or a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element. If there is no such element, it is null. If the body element is null, then when the specification requires that events be fired at "the body element", they must instead be fired at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object.

The *body* attribute, on getting, must return [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) of the document (either a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element, a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, or null). On setting, the following algorithm must be run:

1. If the new value is not a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) or [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, then raise a [HIERARCHY\_REQUEST\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#hierarchy_request_err) exception and abort these steps.
2. Otherwise, if the new value is the same as [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0), do nothing. Abort these steps.
3. Otherwise, if [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) is not null, then replace that element with the new value in the DOM, as if the root element's replaceChild() method had been called with the new value and [the incumbent body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) as its two arguments respectively, then abort these steps.
4. Otherwise, [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) is null. Append the new value to the root element.

document . [images](http://www.w3.org/TR/html5/dom.html#dom-document-images)

Returns an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) of the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

document . [embeds](http://www.w3.org/TR/html5/dom.html#dom-document-embeds)

document . [plugins](http://www.w3.org/TR/html5/dom.html#dom-document-plugins)

Return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) of the [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

document . [links](http://www.w3.org/TR/html5/dom.html#dom-document-links)

Returns an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) of the [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) and [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that have [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attributes.

document . [forms](http://www.w3.org/TR/html5/dom.html#dom-document-forms)

Return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) of the [form](http://www.w3.org/TR/html5/forms.html#the-form-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

document . [scripts](http://www.w3.org/TR/html5/dom.html#dom-document-scripts)

Return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) of the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

The *images* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements.

The *embeds* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements.

The *plugins* attribute must return the same object as that returned by the [embeds](http://www.w3.org/TR/html5/dom.html#dom-document-embeds) attribute.

The *links* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements with [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attributes and [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) elements with [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attributes.

The *forms* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [form](http://www.w3.org/TR/html5/forms.html#the-form-element) elements.

The *scripts* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements.

collection = document . [getElementsByName](http://www.w3.org/TR/html5/dom.html#dom-document-getelementsbyname)(name)

Returns a [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) of elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that have a name attribute with the value name.

collection = document . [getElementsByClassName(classes)](http://www.w3.org/TR/html5/dom.html#dom-document-getelementsbyclassname)

collection = element . [getElementsByClassName(classes)](http://www.w3.org/TR/html5/dom.html#dom-getelementsbyclassname)

Returns a [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) of the elements in the object on which the method was invoked (a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) or an [Element](http://www.w3.org/TR/html5/infrastructure.html#element)) that have all the classes given by classes.

The classes argument is interpreted as a space-separated list of classes.

The *getElementsByName(*name*)* method takes a string name, and must return a [live](http://www.w3.org/TR/html5/infrastructure.html#live) [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) containing all the [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) in that document that have a name attribute whose value is equal to the name argument (in a [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive) manner), in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order). When the method is invoked on a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object again with the same argument, the user agent may return the same as the object returned by the earlier call. In other cases, a new [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) object must be returned.

The *getElementsByClassName(*classNames*)* method takes a string that contains a [set of space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-space-separated-tokens) representing classes. When called, the method must return a [live](http://www.w3.org/TR/html5/infrastructure.html#live) [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) object containing all the elements in the document, in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order), that have all the classes specified in that argument, having obtained the classes by [splitting a string on spaces](http://www.w3.org/TR/html5/common-microsyntaxes.html#split-a-string-on-spaces). (Duplicates are ignored.) If there are no tokens specified in the argument, then the method must return an empty [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist). If the document is in [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode), then the comparisons for the classes must be done in an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) manner, otherwise, the comparisons must be done in a [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive) manner. When the method is invoked on a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object again with the same argument, the user agent may return the same object as the object returned by the earlier call. In other cases, a new [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) object must be returned.

The *getElementsByClassName(*classNames*)* method on the [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) interface must return a [live](http://www.w3.org/TR/html5/infrastructure.html#live) [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) with the nodes that the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) [getElementsByClassName()](http://www.w3.org/TR/html5/dom.html#dom-document-getelementsbyclassname) method would return when passed the same argument(s), excluding any elements that are not descendants of the [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) object on which the method was invoked. When the method is invoked on an [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) object again with the same argument, the user agent may return the same object as the object returned by the earlier call. In other cases, a new [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) object must be returned.

HTML, SVG, and MathML elements define which classes they are in by having an attribute with no namespace with the name class containing a space-separated list of classes to which the element belongs. Other specifications may also allow elements in their namespaces to be labeled as being in specific classes.

Given the following XHTML fragment:

<div id="example">

<p id="p1" class="aaa bbb"/>

<p id="p2" class="aaa ccc"/>

<p id="p3" class="bbb ccc"/>

</div>

A call to document.getElementById('example').getElementsByClassName('aaa') would return a [NodeList](http://www.w3.org/TR/html5/infrastructure.html#nodelist) with the two paragraphs p1 and p2 in it.

A call to getElementsByClassName('ccc bbb') would only return one node, however, namely p3. A call to document.getElementById('example').getElementsByClassName('bbb  ccc ') would return the same thing.

A call to getElementsByClassName('aaa,bbb') would return no nodes; none of the elements above are in the "aaa,bbb" class.

The [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface supports named properties. The [supported property names](http://www.w3.org/TR/html5/infrastructure.html#supported-property-names) at any moment consist of the values of the name content attributes of all the [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [form](http://www.w3.org/TR/html5/forms.html#the-form-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), and [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that have name content attributes, and the values of the [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attributes of all the [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) and [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that have [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attributes, and the values of the [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attributes of all the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that have both name content attributes and [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attributes.

When the *HTMLDocument* object is indexed for property retrieval using a name name, then the user agent must return the value obtained using the following steps:

1. Let elements be the list of [named elements](http://www.w3.org/TR/html5/dom.html#dom-document-nameditem-filter) with the name name in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

There will be at least one such element, by definition.

1. If elements has only one element, and that element is an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, then return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) represented by that [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, and abort these steps.
2. Otherwise, if elements has only one element, return that element and abort these steps.
3. Otherwise return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [named elements](http://www.w3.org/TR/html5/dom.html#dom-document-nameditem-filter) with the name name.

Named elements with the name name, for the purposes of the above algorithm, are those that are either:

* [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [form](http://www.w3.org/TR/html5/forms.html#the-form-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), or [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements that have a name content attribute whose value is name, or
* [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) or [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements that have an [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attribute whose value is name, or
* [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements that have an [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attribute whose value is name, and that have a name content attribute present also.

An [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element is said to be exposed if it has no [exposed](http://www.w3.org/TR/html5/dom.html#exposed) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) ancestor, and, for [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements, is additionally either not showing its [fallback content](http://www.w3.org/TR/html5/content-models.html#fallback-content) or has no [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) or [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) descendants.

The [dir](http://www.w3.org/TR/html5/elements.html#dom-document-dir) attribute on the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface is defined along with the [dir](http://www.w3.org/TR/html5/elements.html#the-dir-attribute) content attribute.

#### 3.1.5 Creating documents

[XML documents](http://www.w3.org/TR/html5/dom.html#xml-documents) can be created from script using the [createDocument()](http://www.w3.org/TR/html5/infrastructure.html#dom-domimplementation-createdocument) method on the [DOMImplementation](http://www.w3.org/TR/html5/infrastructure.html#domimplementation) interface.

[HTML documents](http://www.w3.org/TR/html5/dom.html#html-documents) can be created using the [createHTMLDocument()](http://www.w3.org/TR/html5/dom.html#dom-domhtmlimplementation-createhtmldocument) method:

[Supplemental, NoInterfaceObject]

interface DOMHTMLImplementation {

[Document](http://www.w3.org/TR/html5/infrastructure.html#document) [createHTMLDocument](http://www.w3.org/TR/html5/dom.html#dom-domhtmlimplementation-createhtmldocument)(in DOMString title);

};

[DOMImplementation](http://www.w3.org/TR/html5/infrastructure.html#domimplementation) implements [DOMHTMLImplementation](http://www.w3.org/TR/html5/dom.html#domhtmlimplementation);

document = document . implementation . [createHTMLDocument](http://www.w3.org/TR/html5/dom.html#dom-domhtmlimplementation-createhtmldocument)( title )

Returns a new [Document](http://www.w3.org/TR/html5/infrastructure.html#document), with a basic DOM already constructed with an appropriate [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element.

The *createHTMLDocument(*title*)* method, when invoked, must run the following steps:

1. Let doc be a newly created [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object.
2. Mark doc as being an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents).
3. Create a [DocumentType](http://www.w3.org/TR/html5/infrastructure.html#documenttype) node with the name attribute set to the string "html", and the other attributes specific to [DocumentType](http://www.w3.org/TR/html5/infrastructure.html#documenttype) objects set to the empty string, null, and empty lists, as appropriate. Append the newly created node to doc.
4. Create an [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element, and append it to doc.
5. Create a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element, and append it to the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element created in the previous step.
6. Create a [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element, and append it to the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element created in the previous step.
7. Create a [Text](http://www.w3.org/TR/html5/infrastructure.html#text) node, and set its data attribute to the string given by the method's argument (which could be the empty string). Append it to the [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element created in the previous step.
8. Create a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element, and append it to the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element created in the earlier step.
9. Return doc.

#### 3.1.6 Loading XML documents

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object that is an [XML document](http://www.w3.org/TR/html5/dom.html#xml-documents) that was created by the [DOMImplementation.createDocument()](http://www.w3.org/TR/html5/infrastructure.html#dom-domimplementation-createdocument) factory method must also implement the [XMLDocumentLoader](http://www.w3.org/TR/html5/dom.html#xmldocumentloader) interface:

[Supplemental, NoInterfaceObject]

interface XMLDocumentLoader {

boolean [load](http://www.w3.org/TR/html5/dom.html#dom-xmldocumentloader-load)(in DOMString url);

};

The *load(*url*)* method must run the following steps:

1. Let document be the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object on which the method was invoked.
2. [Resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the method's first argument, relative to the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script)'s [base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url). If this is not successful, throw a [SYNTAX\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#syntax_err) exception and abort these steps. Otherwise, let url be the resulting [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url).
3. If the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of url is not the same as the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of document, throw a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception and abort these steps.
4. Remove all child nodes of document, without firing any mutation events.
5. Set the [current document readiness](http://www.w3.org/TR/html5/dom.html#current-document-readiness) of document to "loading".
6. Run the remainder of these steps asynchronously, and return true from the method.
7. Let result be an [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object.
8. Let success be false.
9. [Fetch](http://www.w3.org/TR/html5/fetching-resources.html#fetch) url from the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of document, with the *synchronous flag* set and the *force same-origin flag* set.
10. If the fetch attempt was successful, and the resource's [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type) is an [XML MIME type](http://www.w3.org/TR/html5/infrastructure.html#xml-mime-type), then run these substeps:
    1. Create a new [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) associated with the result document.
    2. Pass this parser the fetched document.
    3. If there is an XML well-formedness or XML namespace well-formedness error, then remove all child nodes from result. Otherwise let success be true.
11. [Queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to run the following steps.
    1. Set the [current document readiness](http://www.w3.org/TR/html5/dom.html#current-document-readiness) of document to "complete".
    2. Replace all the children of document by the children of result (even if it has no children), firing mutation events as if a [DocumentFragment](http://www.w3.org/TR/html5/infrastructure.html#documentfragment) containing the new children had been inserted.
    3. [Fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named load at document.

## 4 The elements of HTML

### 4.1 The root element

#### 4.1.1 The html element

Categories

None.

Contexts in which this element can be used:

As the root element of a document.

Wherever a subdocument fragment is allowed in a compound document.

Content model:

A [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element followed by a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

[manifest](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest)

DOM interface:

interface HTMLHtmlElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {};

The [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) the root of an HTML document.

The *manifest* attribute gives the address of the document's [application cache](http://www.w3.org/TR/html5/offline.html#application-cache) [manifest](http://www.w3.org/TR/html5/offline.html#concept-appcache-manifest), if there is one. If the attribute is present, the attribute's value must be a [valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces).

The [manifest](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest) attribute only [has an effect](http://www.w3.org/TR/html5/offline.html#concept-appcache-init) during the early stages of document load. Changing the attribute dynamically thus has no effect (and thus, no DOM API is provided for this attribute).

For the purposes of [application cache selection](http://www.w3.org/TR/html5/offline.html#concept-appcache-init), later [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) elements cannot affect the [resolving of relative URLs](http://www.w3.org/TR/html5/urls.html#resolve-a-url) in [manifest](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest) attributes, as the attributes are processed before those elements are seen.

The [window.applicationCache](http://www.w3.org/TR/html5/offline.html#dom-applicationcache) IDL attribute provides scripted access to the offline [application cache](http://www.w3.org/TR/html5/offline.html#application-cache) mechanism.

The [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element in the following example declares that the document's language is English.

<!DOCTYPE html>

**<html lang="en">**

<head>

<title>Swapping Songs</title>

</head>

<body>

<h1>Swapping Songs</h1>

<p>Tonight I swapped some of the songs I wrote with some friends, who

gave me some of the songs they wrote. I love sharing my music.</p>

</body>

**</html>**

### 4.2 Document metadata

#### 4.2.1 The head element

Categories

None.

Contexts in which this element can be used:

As the first element in an [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element.

Content model:

If the document is [an iframe srcdoc document](http://www.w3.org/TR/html5/the-iframe-element.html#an-iframe-srcdoc-document) or if title information is available from a higher-level protocol: Zero or more elements of [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

Otherwise: One or more elements of [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content), of which exactly one is a [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

DOM interface:

interface HTMLHeadElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {};

The [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) a collection of metadata for the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

The collection of metadata in a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element can be large or small. Here is an example of a very short one:

<!doctype html>

<html>

<head>

<title>A document with a short head</title>

</head>

<body>

...

Here is an example of a longer one:

<!DOCTYPE HTML>

<HTML>

<HEAD>

<META CHARSET="UTF-8">

<BASE HREF="http://www.example.com/">

<TITLE>An application with a long head</TITLE>

<LINK REL="STYLESHEET" HREF="default.css">

<LINK REL="STYLESHEET ALTERNATE" HREF="big.css" TITLE="Big Text">

<SCRIPT SRC="support.js"></SCRIPT>

<META NAME="APPLICATION-NAME" CONTENT="Long headed application">

</HEAD>

<BODY>

...

The [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element is a required child in most situations, but when a higher-level protocol provides title information, e.g. in the Subject line of an e-mail when HTML is used as an e-mail authoring format, the [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element can be omitted.

#### 4.2.2 The title element

Categories

[Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

Contexts in which this element can be used:

In a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element containing no other [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) elements.

Content model:

[Text](http://www.w3.org/TR/html5/content-models.html#text-content).

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

DOM interface:

interface HTMLTitleElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [text](http://www.w3.org/TR/html5/semantics.html#dom-title-text);

};

The [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) the document's title or name. Authors should use titles that identify their documents even when they are used out of context, for example in a user's history or bookmarks, or in search results. The document's title is often different from its first heading, since the first heading does not have to stand alone when taken out of context.

There must be no more than one [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element per document.

title . [text](http://www.w3.org/TR/html5/semantics.html#dom-title-text) [ = value ]

Returns the contents of the element, ignoring child nodes that aren't [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node).

Can be set, to replace the element's children with the given value.

The IDL attribute *text* must return a concatenation of the contents of all the [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node) that are direct children of the [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element (ignoring any other nodes such as comments or elements), in tree order. On setting, it must act the same way as the [textContent](http://www.w3.org/TR/html5/infrastructure.html#textcontent) IDL attribute.

Here are some examples of appropriate titles, contrasted with the top-level headings that might be used on those same pages.

<title>Introduction to The Mating Rituals of Bees</title>

...

<h1>Introduction</h1>

<p>This companion guide to the highly successful

<cite>Introduction to Medieval Bee-Keeping</cite> book is...

The next page might be a part of the same site. Note how the title describes the subject matter unambiguously, while the first heading assumes the reader knows what the context is and therefore won't wonder if the dances are Salsa or Waltz:

<title>Dances used during bee mating rituals</title>

...

<h1>The Dances</h1>

The string to use as the document's title is given by the [document.title](http://www.w3.org/TR/html5/dom.html#document.title) IDL attribute.

User agents should use the document's title when referring to the document in their user interface. When the contents of a [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element are used in this way, [the directionality](http://www.w3.org/TR/html5/elements.html#the-directionality) of that [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) element should be used to set the directionality of the document's title in the user interface.

#### 4.2.3 The base element

Categories

[Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

Contexts in which this element can be used:

In a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element containing no other [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) elements.

Content model:

Empty.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

[href](http://www.w3.org/TR/html5/semantics.html#attr-base-href)

[target](http://www.w3.org/TR/html5/semantics.html#attr-base-target)

DOM interface:

interface HTMLBaseElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [href](http://www.w3.org/TR/html5/semantics.html#dom-base-href);

attribute DOMString [target](http://www.w3.org/TR/html5/semantics.html#dom-base-target);

};

The [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element allows authors to specify the [document base URL](http://www.w3.org/TR/html5/urls.html#document-base-url) for the purposes of [resolving relative URLs](http://www.w3.org/TR/html5/urls.html#resolve-a-url), and the name of the default [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for the purposes of [following hyperlinks](http://www.w3.org/TR/html5/links.html#following-hyperlinks). The element does not [represent](http://www.w3.org/TR/html5/rendering.html#represents) any content beyond this information.

There must be no more than one [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element per document.

A [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element must have either an [href](http://www.w3.org/TR/html5/semantics.html#attr-base-href) attribute, a [target](http://www.w3.org/TR/html5/semantics.html#attr-base-target) attribute, or both.

The *href* content attribute, if specified, must contain a [valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces).

A [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element, if it has an [href](http://www.w3.org/TR/html5/semantics.html#attr-base-href) attribute, must come before any other elements in the tree that have attributes defined as taking [URLs](http://www.w3.org/TR/html5/urls.html#url), except the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element (its [manifest](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest) attribute isn't affected by [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) elements).

If there are multiple [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) elements with [href](http://www.w3.org/TR/html5/semantics.html#attr-base-href) attributes, all but the first are ignored.

The *target* attribute, if specified, must contain a [valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword), which specifies which [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is to be used as the default when [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink) and [forms](http://www.w3.org/TR/html5/forms.html#the-form-element) in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) cause [navigation](http://www.w3.org/TR/html5/history.html#navigate).

A [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element, if it has a [target](http://www.w3.org/TR/html5/semantics.html#attr-base-target) attribute, must come before any elements in the tree that represent [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink).

If there are multiple [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) elements with [target](http://www.w3.org/TR/html5/semantics.html#attr-base-target) attributes, all but the first are ignored.

The *href* IDL attribute, on getting, must return the page's [document base URL](http://www.w3.org/TR/html5/urls.html#document-base-url), and on setting, it must set the [href](http://www.w3.org/TR/html5/semantics.html#attr-base-href) content attribute to the given new value.

The *target* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

In this example, a [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) element is used to set the [document base URL](http://www.w3.org/TR/html5/urls.html#document-base-url):

<!DOCTYPE html>

<html>

<head>

<title>This is an example for the &lt;base&gt; element</title>

<base href="http://www.example.com/news/index.html">

</head>

<body>

<p>Visit the <a href="archives.html">archives</a>.</p>

</body>

</html>

The link in the above example would be a link to "http://www.example.com/news/archives.html".

#### 4.2.4 The link element

Categories

[Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

Contexts in which this element can be used:

Where [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content) is expected.

In a [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) element that is a child of a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

Content model:

Empty.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

[href](http://www.w3.org/TR/html5/semantics.html#attr-link-href)

[rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel)

[media](http://www.w3.org/TR/html5/semantics.html#attr-link-media)

[hreflang](http://www.w3.org/TR/html5/semantics.html#attr-link-hreflang)

[type](http://www.w3.org/TR/html5/semantics.html#attr-link-type)

[sizes](http://www.w3.org/TR/html5/links.html#attr-link-sizes)

Also, the [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title) attribute has special semantics on this element.

DOM interface:

interface HTMLLinkElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute boolean [disabled](http://www.w3.org/TR/html5/semantics.html#dom-link-disabled);

attribute DOMString [href](http://www.w3.org/TR/html5/semantics.html#dom-link-href);

attribute DOMString [rel](http://www.w3.org/TR/html5/semantics.html#dom-link-rel);

readonly attribute [DOMTokenList](http://www.w3.org/TR/html5/common-dom-interfaces.html#domtokenlist) [relList](http://www.w3.org/TR/html5/semantics.html#dom-link-rellist);

attribute DOMString [media](http://www.w3.org/TR/html5/semantics.html#dom-link-media);

attribute DOMString [hreflang](http://www.w3.org/TR/html5/semantics.html#dom-link-hreflang);

attribute DOMString [type](http://www.w3.org/TR/html5/semantics.html#dom-link-type);

[PutForwards=[value](http://www.w3.org/TR/html5/common-dom-interfaces.html#dom-domsettabletokenlist-value)] readonly attribute [DOMSettableTokenList](http://www.w3.org/TR/html5/common-dom-interfaces.html#domsettabletokenlist) [sizes](http://www.w3.org/TR/html5/semantics.html#dom-link-sizes);

};

[HTMLLinkElement](http://www.w3.org/TR/html5/semantics.html#htmllinkelement) implements LinkStyle;

The [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element allows authors to link their document to other resources.

The destination of the link(s) is given by the *href* attribute, which must be present and must contain a [valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces). If the [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) attribute is absent, then the element does not define a link.

A [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element must have [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute.

The types of link indicated (the relationships) are given by the value of the *rel* attribute, which, if present, must have a value that is a [set of space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-space-separated-tokens). The [allowed keywords and their meanings](http://www.w3.org/TR/html5/links.html#linkTypes) are defined in a later section. If the [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute is absent, has no keywords, or if none of the keywords used are allowed according to the definitions in this specification, then the element does not create any links.

Two categories of links can be created using the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element: [Links to external resources](http://www.w3.org/TR/html5/links.html#external-resource-link) and [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink). The [link types section](http://www.w3.org/TR/html5/links.html#linkTypes) defines whether a particular link type is an external resource or a hyperlink. One [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element can create multiple links (of which some might be external resource links and some might be hyperlinks); exactly which and how many links are created depends on the keywords given in the [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute. User agents must process the links on a per-link basis, not a per-element basis.

Each link created for a [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element is handled separately. For instance, if there are two [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements with rel="stylesheet", they each count as a separate external resource, and each is affected by its own attributes independently. Similarly, if a single [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element has a [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute with the value next stylesheet, it creates both a [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) (for the [next](http://www.w3.org/TR/html5/links.html#link-type-next) keyword) and an [external resource link](http://www.w3.org/TR/html5/links.html#external-resource-link) (for the [stylesheet](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) keyword), and they are affected by other attributes (such as [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) or [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title)) differently.

The exact behavior for links to external resources depends on the exact relationship, as defined for the relevant link type. Some of the attributes control whether or not the external resource is to be applied (as defined below).

For external resources that are represented in the DOM (for example, style sheets), the DOM representation must be made available even if the resource is not applied. To obtain the resource, the user agent must run the following steps:

1. If the [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) attribute's value is the empty string, then abort these steps.
2. [Resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the [URL](http://www.w3.org/TR/html5/urls.html#url) given by the [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) attribute, relative to the element.
3. If the previous step fails, then abort these steps.
4. [Fetch](http://www.w3.org/TR/html5/fetching-resources.html#fetch) the resulting [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url).

User agents may opt to only try to obtain such resources when they are needed, instead of pro-actively [fetching](http://www.w3.org/TR/html5/fetching-resources.html#fetch) all the external resources that are not applied.

The semantics of the protocol used (e.g. HTTP) must be followed when fetching external resources. (For example, redirects will be followed and 404 responses will cause the external resource to not be applied.)

Once the attempts to obtain the resource and its [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources) are complete, the user agent must, if the loads were successful, [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named load at the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element, or, if the resource or one of its [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources) failed to completely load for any reason (e.g. DNS error, HTTP 404 response, a connection being prematurely closed, unsupported Content-Type), [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named error at the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element. Non-network errors in processing the resource or its subresources (e.g. CSS parse errors, PNG decoding errors) are not failures for the purposes of this paragraph.

The [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) for these [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) is the [DOM manipulation task source](http://www.w3.org/TR/html5/webappapis.html#dom-manipulation-task-source).

The element must [delay the load event](http://www.w3.org/TR/html5/the-end.html#delay-the-load-event) of the element's document until all the attempts to obtain the resource and its [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources) are complete. (Resources that the user agent has not yet attempted to obtain, e.g. because it is waiting for the resource to be needed, do not [delay the load event](http://www.w3.org/TR/html5/the-end.html#delay-the-load-event).)

Interactive user agents may provide users with a means to [follow the hyperlinks](http://www.w3.org/TR/html5/links.html#following-hyperlinks) created using the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element, somewhere within their user interface. The exact interface is not defined by this specification, but it could include the following information (obtained from the element's attributes, again as defined below), in some form or another (possibly simplified), for each hyperlink created with each [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element in the document:

* The relationship between this document and the resource (given by the [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute)
* The title of the resource (given by the [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title) attribute).
* The address of the resource (given by the [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) attribute).
* The language of the resource (given by the [hreflang](http://www.w3.org/TR/html5/semantics.html#attr-link-hreflang) attribute).
* The optimum media for the resource (given by the [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) attribute).

User agents could also include other information, such as the type of the resource (as given by the [type](http://www.w3.org/TR/html5/semantics.html#attr-link-type) attribute).

Hyperlinks created with the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element and its [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute apply to the whole page. This contrasts with the [rel](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel) attribute of [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) and [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) elements, which indicates the type of a link whose context is given by the link's location within the document.

The *media* attribute says which media the resource applies to. The value must be a [valid media query](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-media-query).

If the link is a [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) then the [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) attribute is purely advisory, and describes for which media the document in question was designed.

However, if the link is an [external resource link](http://www.w3.org/TR/html5/links.html#external-resource-link), then the [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) attribute is prescriptive. The user agent must apply the external resource when the [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) attribute's value [matches the environment](http://www.w3.org/TR/html5/common-microsyntaxes.html#matches-the-environment) and the other relevant conditions apply, and must not apply it otherwise.

The external resource might have further restrictions defined within that limit its applicability. For example, a CSS style sheet might have some @media blocks. This specification does not override such further restrictions or requirements.

The default, if the [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media) attribute is omitted, is "all", meaning that by default links apply to all media.

The *hreflang* attribute on the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element has the same semantics as the [hreflang attribute on a and area elements](http://www.w3.org/TR/html5/links.html#attr-hyperlink-hreflang).

The *type* attribute gives the [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) of the linked resource. It is purely advisory. The value must be a [valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type).

For [external resource links](http://www.w3.org/TR/html5/links.html#external-resource-link), the [type](http://www.w3.org/TR/html5/semantics.html#attr-link-type) attribute is used as a hint to user agents so that they can avoid fetching resources they do not support. If the attribute is present, then the user agent must assume that the resource is of the given type (even if that is not a [valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type), e.g. the empty string). If the attribute is omitted, but the external resource link type has a default type defined, then the user agent must assume that the resource is of that type. If the UA does not support the given [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) for the given link relationship, then the UA should not [obtain](http://www.w3.org/TR/html5/semantics.html#concept-link-obtain) the resource; if the UA does support the given [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) for the given link relationship, then the UA should [obtain](http://www.w3.org/TR/html5/semantics.html#concept-link-obtain) the resource at the appropriate time as specified for the [external resource link](http://www.w3.org/TR/html5/links.html#external-resource-link)'s particular type. If the attribute is omitted, and the external resource link type does not have a default type defined, but the user agent would [obtain](http://www.w3.org/TR/html5/semantics.html#concept-link-obtain) the resource if the type was known and supported, then the user agent should [obtain](http://www.w3.org/TR/html5/semantics.html#concept-link-obtain) the resource under the assumption that it will be supported.

User agents must not consider the [type](http://www.w3.org/TR/html5/semantics.html#attr-link-type) attribute authoritative — upon fetching the resource, user agents must not use the [type](http://www.w3.org/TR/html5/semantics.html#attr-link-type) attribute to determine its actual type. Only the actual type (as defined in the next paragraph) is used to determine whether to apply the resource, not the aforementioned assumed type.

If the external resource link type defines rules for processing the resource's [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type), then those rules apply. Otherwise, if the resource is expected to be an image, user agents may apply the [image sniffing rules](http://www.w3.org/TR/html5/fetching-resources.html#content-type-sniffing:-image), with the official type being the type determined from the resource's [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type), and use the resulting sniffed type of the resource as if it was the actual type. Otherwise, if neither of these conditions apply or if the user agent opts not to apply the image sniffing rules, then the user agent must use the resource's [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type) to determine the type of the resource. If there is no type metadata, but the external resource link type has a default type defined, then the user agent must assume that the resource is of that type.

The [stylesheet](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) link type defines rules for processing the resource's [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type).

Once the user agent has established the type of the resource, the user agent must apply the resource if it is of a supported type and the other relevant conditions apply, and must ignore the resource otherwise.

If a document contains style sheet links labeled as follows:

<link rel="stylesheet" href="A" type="text/plain">

<link rel="stylesheet" href="B" type="text/css">

<link rel="stylesheet" href="C">

...then a compliant UA that supported only CSS style sheets would fetch the B and C files, and skip the A file (since text/plain is not the [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) for CSS style sheets).

For files B and C, it would then check the actual types returned by the server. For those that are sent as text/css, it would apply the styles, but for those labeled as text/plain, or any other type, it would not.

If one of the two files was returned without a [Content-Type](http://www.w3.org/TR/html5/fetching-resources.html#content-type) metadata, or with a syntactically incorrect type like Content-Type: "null", then the default type for [stylesheet](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) links would kick in. Since that default type is text/css, the style sheet would nonetheless be applied.

The *title* attribute gives the title of the link. With one exception, it is purely advisory. The value is text. The exception is for style sheet links, where the [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title) attribute defines alternative style sheet sets.

The [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title) attribute on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements differs from the global [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute of most other elements in that a link without a title does not inherit the title of the parent element: it merely has no title.

The [sizes](http://www.w3.org/TR/html5/links.html#attr-link-sizes) attribute is used with the [icon](http://www.w3.org/TR/html5/links.html#rel-icon) link type. The attribute must not be specified on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements that do not have a [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute that specifies the [icon](http://www.w3.org/TR/html5/links.html#rel-icon) keyword.

HTTP Link: headers, if supported, must be assumed to come before any links in the document, in the order that they were given in the HTTP entity header. (URLs in these headers are to be processed and resolved according to the rules given in the relevant specification; the rules of this specification don't apply.) [[HTTP]](http://www.w3.org/TR/html5/references.html#refsHTTP) [[WEBLINK]](http://www.w3.org/TR/html5/references.html#refsWEBLINK)

The IDL attributes *href*, *rel*, *media*, *hreflang*, and *type*, and *sizes* each must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The IDL attribute *relList* must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) content attribute.

The IDL attribute *disabled* only applies to style sheet links. When the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element defines a style sheet link, then the [disabled](http://www.w3.org/TR/html5/semantics.html#dom-link-disabled) attribute behaves as defined [for the alternative style sheets DOM](http://www.w3.org/TR/html5/semantics.html#dom-linkstyle-disabled). For all other [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements it always return false and does nothing on setting.

The LinkStyle interface is also implemented by this element; the [styling processing model](http://www.w3.org/TR/html5/semantics.html#styling) defines how. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

Here, a set of [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements provide some style sheets:

<!-- a persistent style sheet -->

<link rel="stylesheet" href="default.css">

<!-- the preferred alternate style sheet -->

<link rel="stylesheet" href="green.css" title="Green styles">

<!-- some alternate style sheets -->

<link rel="alternate stylesheet" href="contrast.css" title="High contrast">

<link rel="alternate stylesheet" href="big.css" title="Big fonts">

<link rel="alternate stylesheet" href="wide.css" title="Wide screen">

The following example shows how you can specify versions of the page that use alternative formats, are aimed at other languages, and that are intended for other media:

<link rel=alternate href="/en/html" hreflang=en type=text/html title="English HTML">

<link rel=alternate href="/fr/html" hreflang=fr type=text/html title="French HTML">

<link rel=alternate href="/en/html/print" hreflang=en type=text/html media=print title="English HTML (for printing)">

<link rel=alternate href="/fr/html/print" hreflang=fr type=text/html media=print title="French HTML (for printing)">

<link rel=alternate href="/en/pdf" hreflang=en type=application/pdf title="English PDF">

<link rel=alternate href="/fr/pdf" hreflang=fr type=application/pdf title="French PDF">

#### 4.2.5 The meta element

Categories

[Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

Contexts in which this element can be used:

If the [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute is present, or if the element's [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute is in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type): in a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

If the [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute is present but not in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type): in a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

If the [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute is present but not in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type): in a [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) element that is a child of a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

If the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute is present: where [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content) is expected.

Content model:

Empty.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

[name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name)

[http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv)

[content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content)

[charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset)

DOM interface:

interface HTMLMetaElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [name](http://www.w3.org/TR/html5/semantics.html#dom-meta-name);

attribute DOMString [httpEquiv](http://www.w3.org/TR/html5/semantics.html#dom-meta-httpequiv);

attribute DOMString [content](http://www.w3.org/TR/html5/semantics.html#dom-meta-content);

};

The [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) various kinds of metadata that cannot be expressed using the [title](http://www.w3.org/TR/html5/semantics.html#the-title-element), [base](http://www.w3.org/TR/html5/semantics.html#the-base-element), [link](http://www.w3.org/TR/html5/semantics.html#the-link-element), [style](http://www.w3.org/TR/html5/semantics.html#the-style-element), and [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements.

The [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element can represent document-level metadata with the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute, pragma directives with the [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute, and the file's [character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration) when an HTML document is serialized to string form (e.g. for transmission over the network or for disk storage) with the [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute.

Exactly one of the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name), [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv), and [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attributes must be specified.

If either [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) or [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) is specified, then the [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute must also be specified. Otherwise, it must be omitted.

The *charset* attribute specifies the character encoding used by the document. This is a [character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration). If the attribute is present in an [XML document](http://www.w3.org/TR/html5/dom.html#xml-documents), its value must be an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "UTF-8" (and the document is therefore forced to use UTF-8 as its encoding).

The [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute on the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no effect in XML documents, and is only allowed in order to facilitate migration to and from XHTML.

There must not be more than one [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with a [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute per document.

The *content* attribute gives the value of the document metadata or pragma directive when the element is used for those purposes. The allowed values depend on the exact context, as described in subsequent sections of this specification.

If a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has a *name* attribute, it sets document metadata. Document metadata is expressed in terms of name/value pairs, the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute on the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element giving the name, and the [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute on the same element giving the value. The name specifies what aspect of metadata is being set; valid names and the meaning of their values are described in the following sections. If a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute, then the value part of the metadata name/value pair is the empty string.

The *name* and *content* IDL attributes must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name. The IDL attribute *httpEquiv* must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv).

##### 4.2.5.1 Standard metadata names

This specification defines a few names for the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute of the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element.

Names are case-insensitive, and must be compared in an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) manner.

*application-name*

The value must be a short free-form string giving the name of the Web application that the page represents. If the page is not a Web application, the [application-name](http://www.w3.org/TR/html5/semantics.html#meta-application-name) metadata name must not be used. There must not be more than one [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with its [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute set to the value [application-name](http://www.w3.org/TR/html5/semantics.html#meta-application-name) per document. User agents may use the application name in UI in preference to the page's [title](http://www.w3.org/TR/html5/semantics.html#the-title-element), since the title might include status messages and the like relevant to the status of the page at a particular moment in time instead of just being the name of the application.

*author*

The value must be a free-form string giving the name of one of the page's authors.

*description*

The value must be a free-form string that describes the page. The value must be appropriate for use in a directory of pages, e.g. in a search engine. There must not be more than one [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with its [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute set to the value [description](http://www.w3.org/TR/html5/semantics.html#meta-description) per document.

*generator*

The value must be a free-form string that identifies one of the software packages used to generate the document. This value must not be used on hand-authored pages.

Here is what a tool called "Frontweaver" could include in its output, in the page's [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element, to identify itself as the tool used to generate the page:

<meta name=generator content="Frontweaver 8.2">

*keywords*

The value must be a [set of comma-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-comma-separated-tokens), each of which is a keyword relevant to the page.

This page about typefaces on British motorways uses a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element to specify some keywords that users might use to look for the page:

<!DOCTYPE HTML>

<html>

<head>

<title>Typefaces on UK motorways</title>

<meta name="keywords" content="british,type face,font,fonts,highway,highways">

</head>

<body>

...

Many search engines do not consider such keywords, because this feature has historically been used unreliably and even misleadingly as a way to spam search engine results in a way that is not helpful for users.

To obtain the list of keywords that the author has specified as applicable to the page, the user agent must run the following steps:

1. Let keywords be an empty list.
2. For each [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with a [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute and a [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute and whose [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute's value is [keywords](http://www.w3.org/TR/html5/semantics.html#meta-keywords), run the following substeps:
   1. [Split the value of the element's content attribute on commas](http://www.w3.org/TR/html5/common-microsyntaxes.html#split-a-string-on-commas).
   2. Add the resulting tokens, if any, to keywords.
3. Remove any duplicates from keywords.
4. Return keywords. This is the list of keywords that the author has specified as applicable to the page.

User agents should not use this information when there is insufficient confidence in the reliability of the value.

For instance, it would be reasonable for a content management system to use the keyword information of pages within the system to populate the index of a site-specific search engine, but a large-scale content aggregator that used this information would likely find that certain users would try to game its ranking mechanism through the use of inappropriate keywords.

##### 4.2.5.2 Other metadata names

Extensions to the predefined set of metadata names may be registered in the [WHATWG Wiki MetaExtensions page](http://wiki.whatwg.org/wiki/MetaExtensions). [[WHATWGWIKI]](http://www.w3.org/TR/html5/references.html#refsWHATWGWIKI)

Anyone is free to edit the WHATWG Wiki MetaExtensions page at any time to add a type. These new names must be specified with the following information:

Keyword

The actual name being defined. The name should not be confusingly similar to any other defined name (e.g. differing only in case).

Brief description

A short non-normative description of what the metadata name's meaning is, including the format the value is required to be in.

Specification

A link to a more detailed description of the metadata name's semantics and requirements. It could be another page on the Wiki, or a link to an external page.

Synonyms

A list of other names that have exactly the same processing requirements. Authors should not use the names defined to be synonyms, they are only intended to allow user agents to support legacy content. Anyone may remove synonyms that are not used in practice; only names that need to be processed as synonyms for compatibility with legacy content are to be registered in this way.

Status

One of the following:

Proposed

The name has not received wide peer review and approval. Someone has proposed it and is, or soon will be, using it.

Ratified

The name has received wide peer review and approval. It has a specification that unambiguously defines how to handle pages that use the name, including when they use it in incorrect ways.

Discontinued

The metadata name has received wide peer review and it has been found wanting. Existing pages are using this metadata name, but new pages should avoid it. The "brief description" and "specification" entries will give details of what authors should use instead, if anything.

If a metadata name is found to be redundant with existing values, it should be removed and listed as a synonym for the existing value.

If a metadata name is registered in the "proposed" state for a period of a month or more without being used or specified, then it may be removed from the registry.

If a metadata name is added with the "proposed" status and found to be redundant with existing values, it should be removed and listed as a synonym for the existing value. If a metadata name is added with the "proposed" status and found to be harmful, then it should be changed to "discontinued" status.

Anyone can change the status at any time, but should only do so in accordance with the definitions above.

Conformance checkers must use the information given on the WHATWG Wiki MetaExtensions page to establish if a value is allowed or not: values defined in this specification or marked as "proposed" or "ratified" must be accepted, whereas values marked as "discontinued" or not listed in either this specification or on the aforementioned page must be rejected as invalid. Conformance checkers may cache this information (e.g. for performance reasons or to avoid the use of unreliable network connectivity).

When an author uses a new metadata name not defined by either this specification or the Wiki page, conformance checkers should offer to add the value to the Wiki, with the details described above, with the "proposed" status.

Metadata names whose values are to be [URLs](http://www.w3.org/TR/html5/urls.html#url) must not be proposed or accepted. Links must be represented using the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element, not the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element.

##### 4.2.5.3 Pragma directives

When the *http-equiv* attribute is specified on a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element, the element is a pragma directive.

The [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute is an [enumerated attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#enumerated-attribute). The following table lists the keywords defined for this attribute. The states given in the first cell of the rows with keywords give the states to which those keywords map. Some of the keywords are non-conforming, as noted in the last column.

| **State** | **Keyword** | **Notes** |
| --- | --- | --- |
| [Content Language](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-language) | content-language | Non-conforming |
| [Encoding declaration](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type) | content-type |  |
| [Default style](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-default-style) | default-style |  |
| [Refresh](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-refresh) | refresh |  |
| [Cookie setter](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-set-cookie) | set-cookie | Non-conforming |

When a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element is [inserted into the document](http://www.w3.org/TR/html5/infrastructure.html#insert-an-element-into-a-document), if its [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute is present and represents one of the above states, then the user agent must run the algorithm appropriate for that state, as described in the following list:

Content language state (http-equiv="content-language")

This feature is non-conforming. Authors are encouraged to use the [lang](http://www.w3.org/TR/html5/elements.html#attr-lang) attribute instead.

This pragma sets the pragma-set default language. Until the pragma is successfully processed, there is no [pragma-set default language](http://www.w3.org/TR/html5/semantics.html#pragma-set-default-language).

1. If another [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Content Language state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-language) has already been successfully processed (i.e. when it was inserted the user agent processed it and reached the last step of this list of steps), then abort these steps.
2. If the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute, or if that attribute's value is the empty string, then abort these steps.
3. If the element's [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute contains a U+002C COMMA character (,) then abort these steps.
4. Let input be the value of the element's [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute.
5. Let position point at the first character of input.
6. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
7. [Collect a sequence of characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#collect-a-sequence-of-characters) that are not [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
8. Let the [pragma-set default language](http://www.w3.org/TR/html5/semantics.html#pragma-set-default-language) be the string that resulted from the previous step.

This pragma is not exactly equivalent to the HTTP Content-Language header. [[HTTP]](http://www.w3.org/TR/html5/references.html#refsHTTP)

Encoding declaration state (http-equiv="content-type")

The [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type) is just an alternative form of setting the charset attribute: it is a [character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration). This state's user agent requirements are all handled by the parsing section of the specification.

For [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type), the [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute must have a value that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for a string that consists of: the literal string "text/html;", optionally followed by any number of [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by the literal string "charset=", followed by the character encoding name of the [character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration).

A document must not contain both a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type) and a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with the [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute present.

The [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type) may be used in [HTML documents](http://www.w3.org/TR/html5/dom.html#html-documents), but elements with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in that state must not be used in [XML documents](http://www.w3.org/TR/html5/dom.html#xml-documents).

Default style state (http-equiv="default-style")

This pragma sets the name of the default alternative style sheet set.

1. If the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute, or if that attribute's value is the empty string, then abort these steps.
2. Set the preferred style sheet set to the value of the element's [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

Refresh state (http-equiv="refresh")

This pragma acts as timed redirect.

1. If another [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Refresh state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-refresh) has already been successfully processed (i.e. when it was inserted the user agent processed it and reached the last step of this list of steps), then abort these steps.
2. If the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute, or if that attribute's value is the empty string, then abort these steps.
3. Let input be the value of the element's [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute.
4. Let position point at the first character of input.
5. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
6. [Collect a sequence of characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#collect-a-sequence-of-characters) in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), and parse the resulting string using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers). If the sequence of characters collected is the empty string, then no number will have been parsed; abort these steps. Otherwise, let time be the parsed number.
7. [Collect a sequence of characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#collect-a-sequence-of-characters) in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9) and U+002E FULL STOP (.). Ignore any collected characters.
8. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
9. Let url be the address of the current page.
10. If the character in input pointed to by position is a U+003B SEMICOLON (";"), then advance position to the next character. Otherwise, jump to the last step.
11. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
12. If the character in input pointed to by position is a U+0055 LATIN CAPITAL LETTER U character (U) or a U+0075 LATIN SMALL LETTER U character (u), then advance position to the next character. Otherwise, jump to the last step.
13. If the character in input pointed to by position is a U+0052 LATIN CAPITAL LETTER R character (R) or a U+0072 LATIN SMALL LETTER R character (r), then advance position to the next character. Otherwise, jump to the last step.
14. If the character in input pointed to by position is s U+004C LATIN CAPITAL LETTER L character (L) or a U+006C LATIN SMALL LETTER L character (l), then advance position to the next character. Otherwise, jump to the last step.
15. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
16. If the character in input pointed to by position is a U+003D EQUALS SIGN ("="), then advance position to the next character. Otherwise, jump to the last step.
17. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
18. If the character in input pointed to by position is either a U+0027 APOSTROPHE character (') or U+0022 QUOTATION MARK character ("), then let quote be that character, and advance position to the next character. Otherwise, let quote be the empty string.
19. Let url be equal to the substring of input from the character at position to the end of the string.
20. If quote is not the empty string, and there is a character in url equal to quote, then truncate url at that character, so that it and all subsequent characters are removed.
21. Strip any trailing [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) from the end of url.
22. Strip any U+0009 CHARACTER TABULATION (tab), U+000A LINE FEED (LF), and U+000D CARRIAGE RETURN (CR) characters from url.
23. [Resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the url value to an [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url), relative to the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element. If this fails, abort these steps.
24. Perform one or more of the following steps:
    * After the refresh has come due (as defined below), if the user has not canceled the redirect and if the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) did not have the [sandboxed automatic features browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#sandboxed-automatic-features-browsing-context-flag) set when the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) was created, [navigate](http://www.w3.org/TR/html5/history.html#navigate) the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to url, with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled), and with the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) as the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context).

For the purposes of the previous paragraph, a refresh is said to have come due as soon as the later of the following two conditions occurs:

* + - At least time seconds have elapsed since the document has [completely loaded](http://www.w3.org/TR/html5/the-end.html#completely-loaded), adjusted to take into account user or user agent preferences.
    - At least time seconds have elapsed since the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element was [inserted into the Document](http://www.w3.org/TR/html5/infrastructure.html#insert-an-element-into-a-document), adjusted to take into account user or user agent preferences.
  + Provide the user with an interface that, when selected, [navigates](http://www.w3.org/TR/html5/history.html#navigate) a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to url, with the document's browsing context as the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context).
  + Do nothing.

In addition, the user agent may, as with anything, inform the user of any and all aspects of its operation, including the state of any timers, the destinations of any timed redirects, and so forth.

For [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Refresh state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-refresh), the [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute must have a value consisting either of:

* just a [valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer), or
* a [valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer), followed by a U+003B SEMICOLON character (;), followed by one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a substring that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "URL", followed by a U+003D EQUALS SIGN character (=), followed by a [valid URL](http://www.w3.org/TR/html5/urls.html#valid-url) that does not start with a literal U+0027 APOSTROPHE (') or U+0022 QUOTATION MARK (") character.

In the former case, the integer represents a number of seconds before the page is to be reloaded; in the latter case the integer represents a number of seconds before the page is to be replaced by the page at the given [URL](http://www.w3.org/TR/html5/urls.html#url).

A news organization's front page could include the following markup in the page's [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element, to ensure that the page automatically reloads from the server every five minutes:

<meta http-equiv="Refresh" content="300">

A sequence of pages could be used as an automated slide show by making each page refresh to the next page in the sequence, using markup such as the following:

<meta http-equiv="Refresh" content="20; URL=page4.html">

Cookie setter (http-equiv="set-cookie")

This pragma sets an HTTP cookie. [[COOKIES]](http://www.w3.org/TR/html5/references.html#refsCOOKIES)

It is non-conforming. Real HTTP headers should be used instead.

1. If the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element has no [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute, or if that attribute's value is the empty string, then abort these steps.
2. [Obtain the storage mutex](http://www.w3.org/TR/html5/webappapis.html#obtain-the-storage-mutex).
3. Act as if receiving a set-cookie-string for [the document's address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) via a "non-HTTP" API, consisting of the value of the element's [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) attribute encoded as UTF-8. [[COOKIES]](http://www.w3.org/TR/html5/references.html#refsCOOKIES) [[RFC3629]](http://www.w3.org/TR/html5/references.html#refsRFC3629)

There must not be more than one [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with any particular state in the document at a time.

##### 4.2.5.4 Other pragma directives

Extensions to the predefined set of pragma directives may, under certain conditions, be registered in the [WHATWG Wiki PragmaExtensions page](http://wiki.whatwg.org/wiki/PragmaExtensions). [[WHATWGWIKI]](http://www.w3.org/TR/html5/references.html#refsWHATWGWIKI)

Such extensions must use a name that is identical to an HTTP header registered in the Permanent Message Header Field Registry, and must have behavior identical to that described for the HTTP header. [[IANAPERMHEADERS]](http://www.w3.org/TR/html5/references.html#refsIANAPERMHEADERS)

Pragma directives corresponding to headers describing metadata, or not requiring specific user agent processing, must not be registered; instead, use [metadata names](http://www.w3.org/TR/html5/semantics.html#concept-meta-extensions). Pragma directives corresponding to headers that affect the HTTP processing model (e.g. caching) must not be registered, as they would result in HTTP-level behavior being different for user agents that implement HTML than for user agents that do not.

Anyone is free to edit the WHATWG Wiki PragmaExtensions page at any time to add a pragma directive satisfying these conditions. Such registrations must specify the following information:

Keyword

The actual name being defined. The name must match a previously-registered HTTP name with the same requirements.

Brief description

A short non-normative description of the purpose of the pragma directive.

Specification

A link to the specification defining the corresponding HTTP header.

Conformance checkers must use the information given on the WHATWG Wiki PragmaExtensions page to establish if a value is allowed or not: values defined in this specification or listed on the aforementioned page must be accepted, whereas values not listed in either this specification or on the aforementioned page must be rejected as invalid. Conformance checkers may cache this information (e.g. for performance reasons or to avoid the use of unreliable network connectivity).

##### 4.2.5.5 Specifying the document's character encoding

A character encoding declaration is a mechanism by which the character encoding used to store or transmit a document is specified.

The following restrictions apply to character encoding declarations:

* The character encoding name given must be the name of the character encoding used to serialize the file.
* The value must be a valid character encoding name, and must be an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the [preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) for that encoding. [[IANACHARSET]](http://www.w3.org/TR/html5/references.html#refsIANACHARSET)
* The character encoding declaration must be serialized without the use of [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref) or character escapes of any kind.
* The element containing the character encoding declaration must be serialized completely within the first 1024 bytes of the document.

In addition, due to a number of restrictions on [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements, there can only be one [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element)-based character encoding declaration per document.

If an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) does not start with a BOM, and if its encoding is not explicitly given by [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type), and the document is not [an iframe srcdoc document](http://www.w3.org/TR/html5/the-iframe-element.html#an-iframe-srcdoc-document), then the character encoding used must be an [ASCII-compatible character encoding](http://www.w3.org/TR/html5/infrastructure.html#ascii-compatible-character-encoding), and, in addition, if that encoding isn't US-ASCII itself, then the encoding must be specified using a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with a [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute or a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type).

If the document is [an iframe srcdoc document](http://www.w3.org/TR/html5/the-iframe-element.html#an-iframe-srcdoc-document), the document must not have a [character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration). (In this case, the source is already decoded, since it is part of the document that contained the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element).)

If an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) contains a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with a [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) attribute or a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with an [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) attribute in the [Encoding declaration state](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv-content-type), then the character encoding used must be an [ASCII-compatible character encoding](http://www.w3.org/TR/html5/infrastructure.html#ascii-compatible-character-encoding).

Authors are encouraged to use UTF-8. Conformance checkers may advise authors against using legacy encodings. [[RFC3629]](http://www.w3.org/TR/html5/references.html#refsRFC3629)

Authoring tools should default to using UTF-8 for newly-created documents. [[RFC3629]](http://www.w3.org/TR/html5/references.html#refsRFC3629)

Encodings in which a series of bytes in the range 0x20 to 0x7E can encode characters other than the corresponding characters in the range U+0020 to U+007E represent a potential security vulnerability: a user agent that does not support the encoding (or does not support the label used to declare the encoding, or does not use the same mechanism to detect the encoding of unlabelled content as another user agent) might end up interpreting technically benign plain text content as HTML tags and JavaScript. For example, this applies to encodings in which the bytes corresponding to "<script>" in ASCII can encode a different string. Authors should not use such encodings, which are known to include JIS\_C6226-1983, JIS\_X0212-1990, HZ-GB-2312, JOHAB (Windows code page 1361), encodings based on ISO-2022, and encodings based on EBCDIC. Furthermore, authors must not use the CESU-8, UTF-7, BOCU-1 and SCSU encodings, which also fall into this category, because these encodings were never intended for use for Web content. [[RFC1345]](http://www.w3.org/TR/html5/references.html#refsRFC1345) [[RFC1842]](http://www.w3.org/TR/html5/references.html#refsRFC1842) [[RFC1468]](http://www.w3.org/TR/html5/references.html#refsRFC1468) [[RFC2237]](http://www.w3.org/TR/html5/references.html#refsRFC2237) [[RFC1554]](http://www.w3.org/TR/html5/references.html#refsRFC1554) [[RFC1922]](http://www.w3.org/TR/html5/references.html#refsRFC1922) [[RFC1557]](http://www.w3.org/TR/html5/references.html#refsRFC1557) [[CESU8]](http://www.w3.org/TR/html5/references.html#refsCESU8) [[UTF7]](http://www.w3.org/TR/html5/references.html#refsUTF7) [[BOCU1]](http://www.w3.org/TR/html5/references.html#refsBOCU1) [[SCSU]](http://www.w3.org/TR/html5/references.html#refsSCSU)

Authors should not use UTF-32, as the encoding detection algorithms described in this specification intentionally do not distinguish it from UTF-16. [[UNICODE]](http://www.w3.org/TR/html5/references.html#refsUNICODE)

Using non-UTF-8 encodings can have unexpected results on form submission and URL encodings, which use the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding) by default.

In XHTML, the XML declaration should be used for inline character encoding information, if necessary.

In HTML, to declare that the character encoding is UTF-8, the author could include the following markup near the top of the document (in the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element):

<meta charset="utf-8">

In XML, the XML declaration would be used instead, at the very top of the markup:

<?xml version="1.0" encoding="utf-8"?>

#### 4.2.6 The style element

Categories

[Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content).

If the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is present: [flow content](http://www.w3.org/TR/html5/content-models.html#flow-content).

Contexts in which this element can be used:

If the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is absent: where [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content) is expected.

If the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is absent: in a [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) element that is a child of a [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

If the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is present: where [flow content](http://www.w3.org/TR/html5/content-models.html#flow-content) is expected, but before any other [flow content](http://www.w3.org/TR/html5/content-models.html#flow-content) other than other [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements and [inter-element whitespace](http://www.w3.org/TR/html5/content-models.html#inter-element-whitespace).

Content model:

Depends on the value of the [type](http://www.w3.org/TR/html5/semantics.html#attr-style-type) attribute, but must match requirements described in prose below.

Content attributes:

[Global attributes](http://www.w3.org/TR/html5/elements.html#global-attributes)

[media](http://www.w3.org/TR/html5/semantics.html#attr-style-media)

[type](http://www.w3.org/TR/html5/semantics.html#attr-style-type)

[scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped)

Also, the [title](http://www.w3.org/TR/html5/semantics.html#attr-style-title) attribute has special semantics on this element.

DOM interface:

interface HTMLStyleElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute boolean [disabled](http://www.w3.org/TR/html5/semantics.html#dom-style-disabled);

attribute DOMString [media](http://www.w3.org/TR/html5/semantics.html#dom-style-media);

attribute DOMString [type](http://www.w3.org/TR/html5/semantics.html#dom-style-type);

attribute boolean [scoped](http://www.w3.org/TR/html5/semantics.html#dom-style-scoped);

};

[HTMLStyleElement](http://www.w3.org/TR/html5/semantics.html#htmlstyleelement) implements LinkStyle;

The [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element allows authors to embed style information in their documents. The [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element is one of several inputs to the [styling processing model](http://www.w3.org/TR/html5/semantics.html#styling). The element does not [represent](http://www.w3.org/TR/html5/rendering.html#represents) content for the user.

The *type* attribute gives the styling language. If the attribute is present, its value must be a [valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type) that designates a styling language. The charset parameter must not be specified. The default value for the [type](http://www.w3.org/TR/html5/semantics.html#attr-style-type) attribute, which is used if the attribute is absent, is "text/css". [[RFC2318]](http://www.w3.org/TR/html5/references.html#refsRFC2318)

When examining types to determine if they support the language, user agents must not ignore unknown MIME parameters — types with unknown parameters must be assumed to be unsupported. The charset parameter must be treated as an unknown parameter for the purpose of comparing [MIME types](http://www.w3.org/TR/html5/infrastructure.html#mime-type) here.

The *media* attribute says which media the styles apply to. The value must be a [valid media query](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-media-query). The user agent must apply the styles when the [media](http://www.w3.org/TR/html5/semantics.html#attr-style-media) attribute's value [matches the environment](http://www.w3.org/TR/html5/common-microsyntaxes.html#matches-the-environment) and the other relevant conditions apply, and must not apply them otherwise.

The styles might be further limited in scope, e.g. in CSS with the use of @media blocks. This specification does not override such further restrictions or requirements.

The default, if the [media](http://www.w3.org/TR/html5/semantics.html#attr-style-media) attribute is omitted, is "all", meaning that by default styles apply to all media.

The *scoped* attribute is a [boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute). If set, it indicates that the styles are intended just for the subtree rooted at the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element's parent element, as opposed to the whole [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

If the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is present, then the user agent must apply the specified style information only to the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element's parent element (if any), and that element's child nodes. Otherwise, the specified styles must, if applied, be applied to the entire document.

For scoped CSS resources, the effect of @-rules must be scoped to the scoped sheet and its subresources, even if the @-rule in question would ordinarily apply to all style sheets that affect the [Document](http://www.w3.org/TR/html5/infrastructure.html#document). Any '@page' rules in scoped CSS resources must be ignored.

For example, an '@font-face' rule defined in a scoped style sheet would only define the font for the purposes of font rules in the scoped section; style sheets outside the scoped section using the same font name would not end up using that embedded font.

The *title* attribute on [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements defines alternative style sheet sets. If the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element has no [title](http://www.w3.org/TR/html5/semantics.html#attr-style-title) attribute, then it has no title; the [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute of ancestors does not apply to the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

The [title](http://www.w3.org/TR/html5/semantics.html#attr-style-title) attribute on [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements, like the [title](http://www.w3.org/TR/html5/semantics.html#attr-link-title) attribute on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements, differs from the global [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute in that a [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) block without a title does not inherit the title of the parent element: it merely has no title.

The [textContent](http://www.w3.org/TR/html5/infrastructure.html#textcontent) of a [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element must match the style production in the following ABNF, the character set for which is Unicode. [[ABNF]](http://www.w3.org/TR/html5/references.html#refsABNF)

style = no-c-start \*( c-start no-c-end c-end no-c-start )

no-c-start = <any string that doesn't contain a substring that matches c-start >

c-start = "<!--"

no-c-end = <any string that doesn't contain a substring that matches c-end >

c-end = "-->"

All descendant elements must be processed, according to their semantics, before the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element itself is evaluated. For styling languages that consist of pure text (as opposed to XML), user agents must evaluate [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements by passing the concatenation of the contents of all the [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node) that are direct children of the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element (not any other nodes such as comments or elements), in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order), to the style system. For XML-based styling languages, user agents must pass all the child nodes of the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element to the style system.

All [URLs](http://www.w3.org/TR/html5/urls.html#url) found by the styling language's processor must be [resolved](http://www.w3.org/TR/html5/urls.html#resolve-a-url), relative to the element (or as defined by the styling language), when the processor is invoked.

Once the attempts to obtain the style sheet's [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources), if any, are complete, or, if the style sheet has no [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources), once the style sheet has been parsed and processed, the user agent must, if the loads were successful or there were none, [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named load at the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element, or, if one of the style sheet's [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources) failed to completely load for any reason (e.g. DNS error, HTTP 404 response, a connection being prematurely closed, unsupported Content-Type), [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named error at the [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element. Non-network errors in processing the style sheet or its subresources (e.g. CSS parse errors, PNG decoding errors) are not failures for the purposes of this paragraph.

The [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) for these [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) is the [DOM manipulation task source](http://www.w3.org/TR/html5/webappapis.html#dom-manipulation-task-source).

The element must [delay the load event](http://www.w3.org/TR/html5/the-end.html#delay-the-load-event) of the element's document until all the attempts to obtain the style sheet's [critical subresources](http://www.w3.org/TR/html5/infrastructure.html#critical-subresources), if any, are complete.

This specification does not specify a style system, but CSS is expected to be supported by most Web browsers. [[CSS]](http://www.w3.org/TR/html5/references.html#refsCSS)

The *media*, *type* and *scoped* IDL attributes must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *disabled* IDL attribute behaves as defined [for the alternative style sheets DOM](http://www.w3.org/TR/html5/semantics.html#dom-linkstyle-disabled).

The LinkStyle interface is also implemented by this element; the [styling processing model](http://www.w3.org/TR/html5/semantics.html#styling) defines how. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

The following document has its emphasis styled as bright red text rather than italics text, while leaving titles of works and Latin words in their default italics. It shows how using appropriate elements enables easier restyling of documents.

<!DOCTYPE html>

<html lang="en-US">

<head>

<title>My favorite book</title>

<style>

body { color: black; background: white; }

em { font-style: normal; color: red; }

</style>

</head>

<body>

<p>My <em>favorite</em> book of all time has <em>got</em> to be

<cite>A Cat's Life</cite>. It is a book by P. Rahmel that talks

about the <i lang="la">Felis Catus</i> in modern human society.</p>

</body>

</html>

#### 4.2.7 Styling

The [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) and [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements can provide styling information for the user agent to use when rendering the document. The DOM Styling specification specifies what styling information is to be used by the user agent and how it is to be used. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

The [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) and [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements implement the LinkStyle interface. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

For [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements, if the user agent does not support the specified styling language, then the sheet attribute of the element's LinkStyle interface must return null. Similarly, [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements that do not represent [external resource links that contribute to the styling processing model](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) (i.e. that do not have a [stylesheet](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) keyword in their [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) attribute), and [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements whose specified resource has not yet been fetched, or is not in a supported styling language, must have their LinkStyle interface's sheet attribute return null.

Otherwise, the LinkStyle interface's sheet attribute must return a StyleSheet object with the following properties: [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

The style sheet type

The style sheet type must be the same as the style's specified type. For [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements, this is the same as the [type](http://www.w3.org/TR/html5/semantics.html#attr-style-type) content attribute's value, or text/css if that is omitted. For [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements, this is the [Content-Type metadata of the specified resource](http://www.w3.org/TR/html5/fetching-resources.html#content-type).

The style sheet location

For [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements, the location must be the result of [resolving](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the [URL](http://www.w3.org/TR/html5/urls.html#url) given by the element's [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) content attribute, relative to the element, or the empty string if that fails. For [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements, there is no location.

The style sheet media

The media must be the same as the value of the element's media content attribute, or the empty string, if the attribute is omitted.

The style sheet title

The title must be the same as the value of the element's [title](http://www.w3.org/TR/html5/elements.html#dom-title) content attribute, if the attribute is present and has a non-empty value. If the attribute is absent or its value is the empty string, then the style sheet does not have a title (it is the empty string). The title is used for defining alternative style sheet sets.

The style sheet alternate flag

For [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements, true if [the link is an alternative stylesheet](http://www.w3.org/TR/html5/links.html#the-link-is-an-alternative-stylesheet). In all other cases, false.

The same object must be returned each time.

The *disabled* IDL attribute on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) and [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) elements must return false and do nothing on setting, if the sheet attribute of their LinkStyle interface is null. Otherwise, it must return the value of the StyleSheet interface's disabled attribute on getting, and forward the new value to that same attribute on setting.

The rules for handling alternative style sheets are defined in the CSS object model specification. [[CSSOM]](http://www.w3.org/TR/html5/references.html#refsCSSOM)

Style sheets, whether added by a [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element, a [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element, an <?xml-stylesheet> PI, an HTTP Link: header, or some other mechanism, have a style sheet ready flag, which is initially unset.

When a style sheet is ready to be applied, its [style sheet ready](http://www.w3.org/TR/html5/semantics.html#style-sheet-ready) flag must be set. If the style sheet referenced no other resources (e.g. it was an internal style sheet given by a [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element with no @import rules), then the style rules must be synchronously made available to script; otherwise, the style rules must only be made available to script once the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) reaches its "update the rendering" step.

A style sheet in the context of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) of an [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) or [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) is said to be a style sheet that is blocking scripts if the element was created by that [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s parser, and the element is either a [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element or a [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element that was an [external resource link that contributes to the styling processing model](http://www.w3.org/TR/html5/links.html#link-type-stylesheet) when the element was created by the parser, and the element's style sheet was enabled when the element was created by the parser, and the element's [style sheet ready](http://www.w3.org/TR/html5/semantics.html#style-sheet-ready) flag is not yet set, and, the last time the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) reached step 1, the element was [in that Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), and the user agent hasn't given up on that particular style sheet yet. A user agent may give up on a style sheet at any time.

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has a style sheet that is blocking scripts if there is either [a style sheet that is blocking scripts](http://www.w3.org/TR/html5/semantics.html#a-style-sheet-that-is-blocking-scripts) in the context of that [Document](http://www.w3.org/TR/html5/infrastructure.html#document), or if that [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) that has a [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context), and the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of that [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) itself [has a style sheet that is blocking scripts](http://www.w3.org/TR/html5/semantics.html#has-a-style-sheet-that-is-blocking-scripts).

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has no style sheet that is blocking scripts if it does not [have a style sheet that is blocking scripts](http://www.w3.org/TR/html5/semantics.html#has-a-style-sheet-that-is-blocking-scripts) as defined in the previous paragraph.

## 5 Loading Web pages

This section describes features that apply most directly to Web browsers. Having said that, except where specified otherwise, the requirements defined in this section do apply to all user agents, whether they are Web browsers or not.

### 5.1 Browsing contexts

A browsing context is an environment in which [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects are presented to the user.

A tab or window in a Web browser typically contains a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), as does an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) or [frame](http://www.w3.org/TR/html5/obsolete.html#frame)s in a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset).

Each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a corresponding [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object.

A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a [session history](http://www.w3.org/TR/html5/history.html#session-history), which lists the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects that that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has presented, is presenting, or will present. At any time, one [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is designated the active document.

Each [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is associated with a [Window](http://www.w3.org/TR/html5/browsers.html#window) object. A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object forwards everything to the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document)'s [Window](http://www.w3.org/TR/html5/browsers.html#window) object.

In general, there is a 1-to-1 mapping from the [Window](http://www.w3.org/TR/html5/browsers.html#window) object to the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object. In one particular case, a [Window](http://www.w3.org/TR/html5/browsers.html#window) can be reused for the presentation of a second [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in the same [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), such that the mapping is then 2-to-1. This occurs when a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is [navigated](http://www.w3.org/TR/html5/history.html#navigate) from the initial [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank) [Document](http://www.w3.org/TR/html5/infrastructure.html#document) to another, with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled).

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) does not necessarily have a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) associated with it. In particular, data mining tools are likely to never instantiate browsing contexts.

A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) can have a creator browsing context, the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) that was responsible for its creation. If a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context), then that is its [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context). Otherwise, if the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has an [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context), then that is its [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context). Otherwise, the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has no [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context).

If a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) A has a [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context), then the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that was the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of that [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context) at the time A was created is the creator *Document*.

When a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is first created, it must be created with a single [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in its session history, whose [address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) is [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank), which is marked as being an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents), and whose [character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding) is UTF-8. The [Document](http://www.w3.org/TR/html5/infrastructure.html#document) must have a single child [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) node, which itself has a single child [body](http://www.w3.org/TR/html5/sections.html#the-body-element) node.

If the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is created specifically to be immediately navigated, then that initial navigation will have [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled).

The [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank) [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is set when the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is created. If the new [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context), then the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank) [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [creator Document](http://www.w3.org/TR/html5/browsers.html#creator-document). Otherwise, the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank) [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is a globally unique identifier assigned when the new [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is created.

#### 5.1.1 Nested browsing contexts

Certain elements (for example, [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements) can instantiate further [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context). These are called nested browsing contexts. If a browsing context P has a [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s D with an element E that nests another browsing context C inside it, then C is said to be nested through D, and E is said to be the browsing context container of C. If the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) element E is [in](http://www.w3.org/TR/html5/infrastructure.html#in-a-document) the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) D, then P is said to be the parent browsing context of C and C is said to be a child browsing context of P. Otherwise, the [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) C has no [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context).

A browsing context A is said to be an ancestor of a browsing context B if there exists a browsing context A' that is a [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of A and that is itself an [ancestor](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context) of B, or if there is a browsing context P that is a [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of A and that is the [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) of B.

A browsing context that is not a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) has no [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context), and is the top-level browsing context of all the browsing contexts for which it is an [ancestor browsing context](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context).

The transitive closure of [parent browsing contexts](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) for a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) gives the list of [ancestor browsing contexts](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context).

The list of the descendant browsing contexts of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) d is the (ordered) list returned by the following algorithm:

1. Let list be an empty list.
2. For each [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of d that is [nested through](http://www.w3.org/TR/html5/browsers.html#browsing-context-nested-through) an element that is [in the Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document) d, in the [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order) of the elements nesting those [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context), run these substeps:
   1. Append that [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) to the list list.
   2. Append the [list of the descendant browsing contexts](http://www.w3.org/TR/html5/browsers.html#list-of-the-descendant-browsing-contexts) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of that [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) to the list list.
3. Return the constructed list.

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is said to be fully active when it is the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of its [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), and either its browsing context is a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), or it has a [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) and the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) [through which](http://www.w3.org/TR/html5/browsers.html#browsing-context-nested-through) it is [nested](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) is itself [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active).

Because they are nested through an element, [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) are always tied to a specific [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in their [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context). User agents must not allow the user to interact with [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of elements that are in [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s that are not themselves [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active).

A [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) can have a [seamless browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#seamless-browsing-context-flag) set, if it is embedded through an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element with a [seamless](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-seamless) attribute.

A [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) can in some cases be taken out of its [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) (e.g. if an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element is removed from its [Document](http://www.w3.org/TR/html5/infrastructure.html#document)). In such a situation, the [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) has no [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context), but it still has the same [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) and is still [nested through](http://www.w3.org/TR/html5/browsers.html#browsing-context-nested-through) that element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document). Such a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) is not a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), and cannot contain [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s that are [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active). Furthermore, if a [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) (such as an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element)) is moved to another [Document](http://www.w3.org/TR/html5/infrastructure.html#document), then the [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) of its [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) will change.

##### 5.1.1.1 Navigating nested browsing contexts in the DOM

window . [top](http://www.w3.org/TR/html5/browsers.html#dom-top)

Returns the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) for the [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context).

window . [parent](http://www.w3.org/TR/html5/browsers.html#dom-parent)

Returns the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) for the [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context).

window . [frameElement](http://www.w3.org/TR/html5/browsers.html#dom-frameelement)

Returns the [Element](http://www.w3.org/TR/html5/infrastructure.html#element) for the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container).

Returns null if there isn't one.

Throws a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception in cross-origin situations.

The *top* IDL attribute on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) b must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of its [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) (which would be its own [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object if it was a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) itself), if it has one, or its own [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object otherwise (e.g. if it was a detached [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context)).

The *parent* IDL attribute on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) b must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context), if there is one (i.e. if b is a [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context)), or the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) b itself, otherwise (i.e. if it is a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) or a detached [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context)).

The *frameElement* IDL attribute on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) d, on getting, must run the following algorithm:

1. If d is not a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context), return null and abort these steps.
2. If the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container)'s [Document](http://www.w3.org/TR/html5/infrastructure.html#document) does not have the [same](http://www.w3.org/TR/html5/origin-0.html#same-origin) [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) as the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script), then throw a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception.
3. Otherwise, return the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) for b.

#### 5.1.2 Auxiliary browsing contexts

It is possible to create new browsing contexts that are related to a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) without being nested through an element. Such browsing contexts are called auxiliary browsing contexts. Auxiliary browsing contexts are always [top-level browsing contexts](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context).

An [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context) has an opener browsing context, which is the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) from which the [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context) was created.

##### 5.1.2.1 Navigating auxiliary browsing contexts in the DOM

The *opener* IDL attribute on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object, on getting, must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) from which the current [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) was created (its [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context)), if there is one, if it is still available, and if the current [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has not [*disowned its opener*](http://www.w3.org/TR/html5/browsers.html#disowned-its-opener). On setting, if the new value is null then the current [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) must disown its opener; if the new value is anything else then the user agent must ignore the new value.

#### 5.1.3 Secondary browsing contexts

User agents may support secondary browsing contexts, which are [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) that form part of the user agent's interface, apart from the main content area.

#### 5.1.4 Security

A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) A is allowed to navigate a second [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) B if one of the following conditions is true:

* Either the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of A is the [same](http://www.w3.org/TR/html5/origin-0.html#same-origin) as the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of B, or
* The browsing context A is a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) with a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), and its [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) is B, or
* The browsing context B is an [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context) and A is [allowed to navigate](http://www.w3.org/TR/html5/browsers.html#allowed-to-navigate) B's [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context), or
* The browsing context B is not a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), but there exists an [ancestor browsing context](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context) of B whose [active document](http://www.w3.org/TR/html5/browsers.html#active-document) has the [same](http://www.w3.org/TR/html5/origin-0.html#same-origin) [origin](http://www.w3.org/TR/html5/origin-0.html#origin) as the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of A (possibly in fact being A itself).

An element has a browsing context scope origin if its [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) or if all of its [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [ancestor browsing contexts](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context) all have [active documents](http://www.w3.org/TR/html5/browsers.html#active-document) whose [origin](http://www.w3.org/TR/html5/origin-0.html#origin) are the [same origin](http://www.w3.org/TR/html5/origin-0.html#same-origin) as the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [origin](http://www.w3.org/TR/html5/origin-0.html#origin). If an element has a [browsing context scope origin](http://www.w3.org/TR/html5/browsers.html#browsing-context-scope-origin), then its value is the [origin](http://www.w3.org/TR/html5/origin-0.html#origin) of the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

#### 5.1.5 Groupings of browsing contexts

Each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is defined as having a list of one or more directly reachable browsing contexts. These are:

* The [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) itself.
* All the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context).
* The [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context).
* All the [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) that have the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) as their [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context).
* The [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context).

The transitive closure of all the [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) that are [directly reachable browsing contexts](http://www.w3.org/TR/html5/browsers.html#directly-reachable-browsing-contexts) forms a unit of related browsing contexts.

Each [unit of related browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-browsing-contexts) is then further divided into the smallest number of groups such that every member of each group has an [active document](http://www.w3.org/TR/html5/browsers.html#active-document) with an [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) that, through appropriate manipulation of the [document.domain](http://www.w3.org/TR/html5/origin-0.html#dom-document-domain) attribute, could be made to be the same as other members of the group, but could not be made the same as members of any other group. Each such group is a unit of related similar-origin browsing contexts.

Each [unit of related similar-origin browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-similar-origin-browsing-contexts) can have a entry script which is used to obtain, amongst other things, the [script's base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url) to [resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) relative [URLs](http://www.w3.org/TR/html5/urls.html#url) used in scripts running in that [unit of related similar-origin browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-similar-origin-browsing-contexts). Initially, there is no [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script). It is changed by the [jump to a code entry-point](http://www.w3.org/TR/html5/webappapis.html#jump-to-a-code-entry-point) algorithm.

There is at most one [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) per [unit of related similar-origin browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-similar-origin-browsing-contexts).

#### 5.1.6 Browsing context names

Browsing contexts can have a browsing context name. By default, a browsing context has no name (its name is not set).

A valid browsing context name is any string with at least one character that does not start with a U+005F LOW LINE character. (Names starting with an underscore are reserved for special keywords.)

A valid browsing context name or keyword is any string that is either a [valid browsing context name](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name) or that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for one of: \_blank, \_self, \_parent, or \_top.

The rules for choosing a browsing context given a browsing context name are as follows. The rules assume that they are being applied in the context of a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context).

1. If the given browsing context name is the empty string or \_self, then the chosen browsing context must be the current one.

If the given browsing context name is \_self, then this is an explicit self-navigation override, which overrides the behavior of the [seamless browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#seamless-browsing-context-flag) set by the [seamless](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-seamless) attribute on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements.

1. If the given browsing context name is \_parent, then the chosen browsing context must be the [parent browsing context](http://www.w3.org/TR/html5/browsers.html#parent-browsing-context) of the current one, unless there isn't one, in which case the chosen browsing context must be the current browsing context.
2. If the given browsing context name is \_top, then the chosen browsing context must be the [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) of the current one, if there is one, or else the current browsing context.
3. If the given browsing context name is not \_blank and there exists a browsing context whose [name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) is the same as the given browsing context name, and the current browsing context is [allowed to navigate](http://www.w3.org/TR/html5/browsers.html#allowed-to-navigate) that browsing context, and the user agent determines that the two browsing contexts are related enough that it is ok if they reach each other, then that browsing context must be the chosen one. If there are multiple matching browsing contexts, the user agent should select one in some arbitrary consistent manner, such as the most recently opened, most recently focused, or more closely related.

If the browsing context is chosen by this step to be the current browsing context, then this is also an [explicit self-navigation override](http://www.w3.org/TR/html5/browsers.html#explicit-self-navigation-override).

1. Otherwise, a new browsing context is being requested, and what happens depends on the user agent's configuration and/or abilities:

If the current browsing context had the [sandboxed navigation browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#sandboxed-navigation-browsing-context-flag) set when its [active document](http://www.w3.org/TR/html5/browsers.html#active-document) was created.

The user agent may offer to create a new [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) or reuse an existing [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context). If the user picks one of those options, then the designated browsing context must be the chosen one (the browsing context's name isn't set to the given browsing context name). Otherwise (if the user agent doesn't offer the option to the user, or if the user declines to allow a browsing context to be used) there must not be a chosen browsing context.

If the user agent has been configured such that in this instance it will create a new browsing context, and the browsing context is being requested as part of [following a hyperlink](http://www.w3.org/TR/html5/links.html#following-hyperlinks) whose [link types](http://www.w3.org/TR/html5/links.html#linkTypes) include the [noreferrer](http://www.w3.org/TR/html5/links.html#link-type-noreferrer) keyword

A new [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) must be created. If the given browsing context name is not \_blank, then the new top-level browsing context's name must be the given browsing context name (otherwise, it has no name). The chosen browsing context must be this new browsing context.

If it is immediately [navigated](http://www.w3.org/TR/html5/history.html#navigate), then the navigation will be done with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled).

If the user agent has been configured such that in this instance it will create a new browsing context, and the [noreferrer](http://www.w3.org/TR/html5/links.html#link-type-noreferrer) keyword doesn't apply

A new [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context) must be created, with the [opener browsing context](http://www.w3.org/TR/html5/browsers.html#opener-browsing-context) being the current one. If the given browsing context name is not \_blank, then the new auxiliary browsing context's name must be the given browsing context name (otherwise, it has no name). The chosen browsing context must be this new browsing context.

If it is immediately [navigated](http://www.w3.org/TR/html5/history.html#navigate), then the navigation will be done with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled).

If the user agent has been configured such that in this instance it will reuse the current browsing context

The chosen browsing context is the current browsing context.

If the user agent has been configured such that in this instance it will not find a browsing context

There must not be a chosen browsing context.

User agent implementors are encouraged to provide a way for users to configure the user agent to always reuse the current browsing context.

### 5.2 The [Window](http://www.w3.org/TR/html5/browsers.html#window) object

[ReplaceableNamedProperties]

interface Window {

// the current browsing context

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [window](http://www.w3.org/TR/html5/browsers.html#dom-window);

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [self](http://www.w3.org/TR/html5/browsers.html#dom-self);

readonly attribute [Document](http://www.w3.org/TR/html5/infrastructure.html#document) [document](http://www.w3.org/TR/html5/browsers.html#dom-document);

attribute DOMString [name](http://www.w3.org/TR/html5/browsers.html#dom-name);

[PutForwards=[href](http://www.w3.org/TR/html5/history.html#dom-location-href)] readonly attribute [Location](http://www.w3.org/TR/html5/history.html#location) [location](http://www.w3.org/TR/html5/history.html#dom-location);

readonly attribute [History](http://www.w3.org/TR/html5/history.html#history-0) [history](http://www.w3.org/TR/html5/history.html#dom-history);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [locationbar](http://www.w3.org/TR/html5/browsers.html#dom-window-locationbar);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [menubar](http://www.w3.org/TR/html5/browsers.html#dom-window-menubar);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [personalbar](http://www.w3.org/TR/html5/browsers.html#dom-window-personalbar);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [scrollbars](http://www.w3.org/TR/html5/browsers.html#dom-window-scrollbars);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [statusbar](http://www.w3.org/TR/html5/browsers.html#dom-window-statusbar);

[Replaceable] readonly attribute [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) [toolbar](http://www.w3.org/TR/html5/browsers.html#dom-window-toolbar); void [close](http://www.w3.org/TR/html5/browsers.html#dom-window-close)();

void [stop](http://www.w3.org/TR/html5/browsers.html#dom-window-stop)();

void [focus](http://www.w3.org/TR/html5/editing.html#dom-window-focus)();

void [blur](http://www.w3.org/TR/html5/editing.html#dom-window-blur)();

// other browsing contexts

[Replaceable] readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [frames](http://www.w3.org/TR/html5/browsers.html#dom-frames);

[Replaceable] readonly attribute unsigned long [length](http://www.w3.org/TR/html5/browsers.html#dom-length);

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [top](http://www.w3.org/TR/html5/browsers.html#dom-top);

attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [opener](http://www.w3.org/TR/html5/browsers.html#dom-opener);

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [parent](http://www.w3.org/TR/html5/browsers.html#dom-parent);

readonly attribute [Element](http://www.w3.org/TR/html5/infrastructure.html#element) [frameElement](http://www.w3.org/TR/html5/browsers.html#dom-frameelement);

[WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [open](http://www.w3.org/TR/html5/browsers.html#dom-open)(in optional DOMString url, in optional DOMString target, in optional DOMString features, in optional DOMString replace);

[getter](http://www.w3.org/TR/html5/browsers.html#dom-window-item) [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) (in unsigned long index);

[getter](http://www.w3.org/TR/html5/browsers.html#dom-window-nameditem) any (in DOMString name);

// the user agent

readonly attribute [Navigator](http://www.w3.org/TR/html5/timers.html#navigator) [navigator](http://www.w3.org/TR/html5/timers.html#dom-navigator);

readonly attribute [ApplicationCache](http://www.w3.org/TR/html5/offline.html#applicationcache) [applicationCache](http://www.w3.org/TR/html5/offline.html#dom-applicationcache);

// user prompts

void [alert](http://www.w3.org/TR/html5/timers.html#dom-alert)(in DOMString message);

boolean [confirm](http://www.w3.org/TR/html5/timers.html#dom-confirm)(in DOMString message);

DOMString [prompt](http://www.w3.org/TR/html5/timers.html#dom-prompt)(in DOMString message, in optional DOMString default);

void [print](http://www.w3.org/TR/html5/timers.html#dom-print)();

any [showModalDialog](http://www.w3.org/TR/html5/timers.html#dom-showmodaldialog)(in DOMString url, in optional any argument);

// [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes)

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onabort](http://www.w3.org/TR/html5/webappapis.html#handler-onabort);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onafterprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onafterprint);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onbeforeprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeprint);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onbeforeunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeunload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncanplay](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplay);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncanplaythrough](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplaythrough);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onchange](http://www.w3.org/TR/html5/webappapis.html#handler-onchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onclick](http://www.w3.org/TR/html5/webappapis.html#handler-onclick);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncontextmenu](http://www.w3.org/TR/html5/webappapis.html#handler-oncontextmenu);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oncuechange](http://www.w3.org/TR/html5/webappapis.html#handler-oncuechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondblclick](http://www.w3.org/TR/html5/webappapis.html#handler-ondblclick);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondrag](http://www.w3.org/TR/html5/webappapis.html#handler-ondrag);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragend](http://www.w3.org/TR/html5/webappapis.html#handler-ondragend);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragenter](http://www.w3.org/TR/html5/webappapis.html#handler-ondragenter);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragleave](http://www.w3.org/TR/html5/webappapis.html#handler-ondragleave);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragover](http://www.w3.org/TR/html5/webappapis.html#handler-ondragover);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondragstart](http://www.w3.org/TR/html5/webappapis.html#handler-ondragstart);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondrop](http://www.w3.org/TR/html5/webappapis.html#handler-ondrop);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ondurationchange](http://www.w3.org/TR/html5/webappapis.html#handler-ondurationchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onemptied](http://www.w3.org/TR/html5/webappapis.html#handler-onemptied);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onended](http://www.w3.org/TR/html5/webappapis.html#handler-onended);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onhashchange](http://www.w3.org/TR/html5/webappapis.html#handler-window-onhashchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oninput](http://www.w3.org/TR/html5/webappapis.html#handler-oninput);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [oninvalid](http://www.w3.org/TR/html5/webappapis.html#handler-oninvalid);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeydown](http://www.w3.org/TR/html5/webappapis.html#handler-onkeydown);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeypress](http://www.w3.org/TR/html5/webappapis.html#handler-onkeypress);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onkeyup](http://www.w3.org/TR/html5/webappapis.html#handler-onkeyup);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadeddata](http://www.w3.org/TR/html5/webappapis.html#handler-onloadeddata);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadedmetadata](http://www.w3.org/TR/html5/webappapis.html#handler-onloadedmetadata);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onloadstart](http://www.w3.org/TR/html5/webappapis.html#handler-onloadstart);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmessage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onmessage);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousedown](http://www.w3.org/TR/html5/webappapis.html#handler-onmousedown);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousemove](http://www.w3.org/TR/html5/webappapis.html#handler-onmousemove);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseout](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseout);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseover](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseover);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmouseup](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseup);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmousewheel](http://www.w3.org/TR/html5/webappapis.html#handler-onmousewheel);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onoffline](http://www.w3.org/TR/html5/webappapis.html#handler-window-onoffline);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ononline](http://www.w3.org/TR/html5/webappapis.html#handler-window-ononline);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpause](http://www.w3.org/TR/html5/webappapis.html#handler-onpause);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onplay](http://www.w3.org/TR/html5/webappapis.html#handler-onplay);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onplaying](http://www.w3.org/TR/html5/webappapis.html#handler-onplaying);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpagehide](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpagehide);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpageshow](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpageshow);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpopstate](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpopstate);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onprogress](http://www.w3.org/TR/html5/webappapis.html#handler-onprogress);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onratechange](http://www.w3.org/TR/html5/webappapis.html#handler-onratechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onreadystatechange](http://www.w3.org/TR/html5/webappapis.html#handler-onreadystatechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onredo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onredo);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onreset](http://www.w3.org/TR/html5/webappapis.html#handler-onreset);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onresize](http://www.w3.org/TR/html5/webappapis.html#handler-window-onresize);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-onscroll);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onseeked](http://www.w3.org/TR/html5/webappapis.html#handler-onseeked);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onseeking](http://www.w3.org/TR/html5/webappapis.html#handler-onseeking);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onselect](http://www.w3.org/TR/html5/webappapis.html#handler-onselect);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onshow](http://www.w3.org/TR/html5/webappapis.html#handler-onshow);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onstalled](http://www.w3.org/TR/html5/webappapis.html#handler-onstalled);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onstorage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onstorage);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onsubmit](http://www.w3.org/TR/html5/webappapis.html#handler-onsubmit);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onsuspend](http://www.w3.org/TR/html5/webappapis.html#handler-onsuspend);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ontimeupdate](http://www.w3.org/TR/html5/webappapis.html#handler-ontimeupdate);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onundo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onundo);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onunload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onvolumechange](http://www.w3.org/TR/html5/webappapis.html#handler-onvolumechange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onwaiting](http://www.w3.org/TR/html5/webappapis.html#handler-onwaiting);

};

[Window](http://www.w3.org/TR/html5/browsers.html#window) implements [EventTarget](http://www.w3.org/TR/html5/infrastructure.html#eventtarget);

window . [window](http://www.w3.org/TR/html5/browsers.html#dom-window)

window . [frames](http://www.w3.org/TR/html5/browsers.html#dom-frames)

window . [self](http://www.w3.org/TR/html5/browsers.html#dom-self)

These attributes all return window.

window . [document](http://www.w3.org/TR/html5/browsers.html#dom-document)

Returns the [active document](http://www.w3.org/TR/html5/browsers.html#active-document).

document . [defaultView](http://www.w3.org/TR/html5/browsers.html#dom-document-defaultview)

Returns the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document).

The *window*, *frames*, and *self* IDL attributes must all return the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object.

The *document* IDL attribute must return the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document).

The *defaultView* IDL attribute of the [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) interface must return the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object, if there is one, or null otherwise.

#### 5.2.1 Security

User agents must raise a [SECURITY\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#security_err) exception whenever any of the members of a [Window](http://www.w3.org/TR/html5/browsers.html#window) object are accessed by scripts whose [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) is not the same as the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin), with the following exceptions:

* The [location](http://www.w3.org/TR/html5/history.html#dom-location) object
* The postMessage() method
* The [frames](http://www.w3.org/TR/html5/browsers.html#dom-frames) attribute
* The [dynamic nested browsing context properties](http://www.w3.org/TR/html5/browsers.html#dynamic-nested-browsing-context-properties)

When a script whose [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) is not the same as the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) attempts to access that [Window](http://www.w3.org/TR/html5/browsers.html#window) object's methods or attributes, the user agent must act as if any changes to the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's properties, getters, setters, etc, were not present.

For members that return objects (including function objects), each distinct [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) that is not the same as the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [effective script origin](http://www.w3.org/TR/html5/origin-0.html#effective-script-origin) must be provided with a separate set of objects. These objects must have the prototype chain appropriate for the script for which the objects are created (not those that would be appropriate for scripts whose [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object) is the [Window](http://www.w3.org/TR/html5/browsers.html#window) object in question).

For instance, if two frames containing [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s from different [origins](http://www.w3.org/TR/html5/origin-0.html#origin) access the same [Window](http://www.w3.org/TR/html5/browsers.html#window) object's postMessage() method, they will get distinct objects that are not equal.

#### 5.2.2 APIs for creating and navigating browsing contexts by name

window = window . [open](http://www.w3.org/TR/html5/browsers.html#dom-open)( [ url [, target [, features [, replace ] ] ] ] )

Opens a window to show url (defaults to [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank)), and returns it. The target argument gives the name of the new window. If a window exists with that name already, it is reused. The replace attribute, if true, means that whatever page is currently open in that window will be removed from the window's session history. The features argument is ignored.

window . [name](http://www.w3.org/TR/html5/browsers.html#dom-name) [ = value ]

Returns the name of the window.

Can be set, to change the name.

window . [close](http://www.w3.org/TR/html5/browsers.html#dom-window-close)()

Closes the window.

window . [stop](http://www.w3.org/TR/html5/browsers.html#dom-window-stop)()

Cancels the document load.

The *open()* method on [Window](http://www.w3.org/TR/html5/browsers.html#window) objects provides a mechanism for [navigating](http://www.w3.org/TR/html5/history.html#navigate) an existing [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) or opening and navigating an [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context).

The method has four arguments, though they are all optional.

The first argument, url, must be a [valid non-empty URL](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url) for a page to load in the browsing context. If no arguments are provided, or if the first argument is the empty string, then the url argument defaults to "[about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank)". The argument must be [resolved](http://www.w3.org/TR/html5/urls.html#resolve-a-url) to an [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) (or an error), relative to the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script)'s [base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url), when the method is invoked.

The second argument, target, specifies the [name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) of the browsing context that is to be navigated. It must be a [valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword). If fewer than two arguments are provided, then the target argument defaults to the value "\_blank".

The third argument, features, has no defined effect and is mentioned for historical reasons only. User agents may interpret this argument as instructions to set the size and position of the browsing context, but are encouraged to instead ignore the argument entirely.

The fourth argument, replace, specifies whether or not the new page will [replace](http://www.w3.org/TR/html5/history.html#replacement-enabled) the page currently loaded in the browsing context, when target identifies an existing browsing context (as opposed to leaving the current page in the browsing context's [session history](http://www.w3.org/TR/html5/history.html#session-history)). When three or fewer arguments are provided, replace defaults to false.

When the method is invoked, the user agent must first select a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to navigate by applying [the rules for choosing a browsing context given a browsing context name](http://www.w3.org/TR/html5/browsers.html#the-rules-for-choosing-a-browsing-context-given-a-browsing-context-name) using the target argument as the name and the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) of the script as the context in which the algorithm is executed, unless the user has indicated a preference, in which case the browsing context to navigate may instead be the one indicated by the user.

For example, suppose there is a user agent that supports control-clicking a link to open it in a new tab. If a user clicks in that user agent on an element whose [onclick](http://www.w3.org/TR/html5/webappapis.html#handler-onclick) handler uses the [window.open()](http://www.w3.org/TR/html5/browsers.html#dom-open) API to open a page in an iframe, but, while doing so, holds the control key down, the user agent could override the selection of the target browsing context to instead target a new tab.

Then, the user agent must [navigate](http://www.w3.org/TR/html5/history.html#navigate) the selected [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to the [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) (or error) obtained from [resolving](http://www.w3.org/TR/html5/urls.html#resolve-a-url) url earlier. If the replace is true or if the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) was just created as part of [the rules for choosing a browsing context given a browsing context name](http://www.w3.org/TR/html5/browsers.html#the-rules-for-choosing-a-browsing-context-given-a-browsing-context-name), then [replacement must be enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled). The navigation must be done with the [browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context) of the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script) as the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context).

The method must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) that was navigated, or null if no browsing context was navigated.

The *name* attribute of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object must, on getting, return the current name of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), and, on setting, set the name of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to the new value.

The name [gets reset](http://www.w3.org/TR/html5/history.html#resetBCName) when the browsing context is navigated to another domain.

The *close()* method on [Window](http://www.w3.org/TR/html5/browsers.html#window) objects should, if the corresponding [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) A is an [auxiliary browsing context](http://www.w3.org/TR/html5/browsers.html#auxiliary-browsing-context) that was created by a script (as opposed to by an action of the user), and if the [browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context) of the [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) that invokes the method is [allowed to navigate](http://www.w3.org/TR/html5/browsers.html#allowed-to-navigate) the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) A, close the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) A (and may [discard](http://www.w3.org/TR/html5/browsers.html#a-browsing-context-is-discarded) it too).

The *stop()* method on [Window](http://www.w3.org/TR/html5/browsers.html#window) objects should, if there is an existing attempt to [navigate](http://www.w3.org/TR/html5/history.html#navigate) the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) and that attempt is not currently running the [unload a document](http://www.w3.org/TR/html5/history.html#unload-a-document) algorithm, cancel that [navigation](http://www.w3.org/TR/html5/history.html#navigate) and any associated instances of the [fetch algorithm](http://www.w3.org/TR/html5/fetching-resources.html#fetch). Otherwise, it must do nothing.

#### 5.2.3 Accessing other browsing contexts

window . [length](http://www.w3.org/TR/html5/browsers.html#dom-length)

Returns the number of [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context).

window[index]

Returns the indicated [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context).

The *length* IDL attribute on the [Window](http://www.w3.org/TR/html5/browsers.html#window) interface must return the number of [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) that are [nested through](http://www.w3.org/TR/html5/browsers.html#browsing-context-nested-through) elements that are [in the Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document) that is the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of that [Window](http://www.w3.org/TR/html5/browsers.html#window) object, if that [Window](http://www.w3.org/TR/html5/browsers.html#window)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) shares the same [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) as the [script's browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context) of the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script) accessing the IDL attribute; otherwise, it must return zero.

The [supported property indices](http://www.w3.org/TR/html5/infrastructure.html#supported-property-indices) on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object at any instant are the numbers in the range 0 .. n-1, where n is the number returned by the [length](http://www.w3.org/TR/html5/browsers.html#dom-length) IDL attribute. If n is zero then there are no [supported property indices](http://www.w3.org/TR/html5/infrastructure.html#supported-property-indices).

To determine the value of an indexed property index of a [Window](http://www.w3.org/TR/html5/browsers.html#window) object, the user agent must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the indexth [child browsing context](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that is nested through an element that is [in the Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), sorted in the [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order) of the elements nesting those [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context).

These properties are the dynamic nested browsing context properties.

#### 5.2.4 Named access on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object

window[name]

Returns the indicated element or collection of elements.

The [Window](http://www.w3.org/TR/html5/browsers.html#window) interface supports named properties. The [supported property names](http://www.w3.org/TR/html5/infrastructure.html#supported-property-names) at any moment consist of:

* the value of the name content attribute for all [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element), [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [form](http://www.w3.org/TR/html5/forms.html#the-form-element), [frame](http://www.w3.org/TR/html5/obsolete.html#frame), [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), and [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements in the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) that have a name content attribute, and
* the value of the [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attribute of any [HTML element](http://www.w3.org/TR/html5/infrastructure.html#html-elements) in the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) with an [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attribute.

It is possible that this will change. Browser vendors are considering limiting this behaviour to [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode). [Read more...](http://www.w3.org/Bugs/Public/show_bug.cgi?id=11960)

When the *Window* object is indexed for property retrieval using a name name, then the user agent must return the value obtained using the following steps:

1. Let elements be the list of [named elements](http://www.w3.org/TR/html5/browsers.html#dom-window-nameditem-filter) with the name name in the [active document](http://www.w3.org/TR/html5/browsers.html#active-document).

There will be at least one such element, by definition.

1. If elements contains an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, then return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) represented by the first such [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order), and abort these steps.
2. Otherwise, if elements has only one element, return that element and abort these steps.
3. Otherwise return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [named elements](http://www.w3.org/TR/html5/browsers.html#dom-window-nameditem-filter) with the name name.

Named elements with the name name, for the purposes of the above algorithm, are those that are either:

* [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element), [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [form](http://www.w3.org/TR/html5/forms.html#the-form-element), [frame](http://www.w3.org/TR/html5/obsolete.html#frame), [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements that have a name content attribute whose value is name, or
* [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) that have an [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) content attribute whose value is name.

#### 5.2.5 Garbage collection and browsing contexts

A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a strong reference to each of its [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s and its [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object, and the user agent itself has a strong reference to its [top-level browsing contexts](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context).

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has a strong reference to its [Window](http://www.w3.org/TR/html5/browsers.html#window) object.

A [Window](http://www.w3.org/TR/html5/browsers.html#window) object [has a strong reference](http://www.w3.org/TR/html5/common-dom-interfaces.html#implied-strong-reference) to its [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object through its [document](http://www.w3.org/TR/html5/browsers.html#dom-document) attribute. Thus, references from other scripts to either of those objects will keep both alive. Similarly, both [Document](http://www.w3.org/TR/html5/infrastructure.html#document) and [Window](http://www.w3.org/TR/html5/browsers.html#window) objects have [implied strong references](http://www.w3.org/TR/html5/common-dom-interfaces.html#implied-strong-reference) to the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object.

Each [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) has a strong reference to its [browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context) and its [document](http://www.w3.org/TR/html5/webappapis.html#script-s-document).

When a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is to discard a *Document*, the user agent must run the following steps:

1. Set the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s salvageable state to false.
2. Run any [unloading document cleanup steps](http://www.w3.org/TR/html5/history.html#unloading-document-cleanup-steps) for the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that are defined by this specification and [other applicable specifications](http://www.w3.org/TR/html5/infrastructure.html#other-applicable-specifications).
3. Remove any [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) associated with the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in any [task source](http://www.w3.org/TR/html5/webappapis.html#task-source), without running those tasks.
4. [Discard](http://www.w3.org/TR/html5/browsers.html#a-browsing-context-is-discarded) all the [child browsing contexts](http://www.w3.org/TR/html5/browsers.html#child-browsing-context) of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).
5. Lose the strong reference from the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to the [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

Whenever a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object is [discarded](http://www.w3.org/TR/html5/browsers.html#discard-a-document), it is also removed from the list of the worker's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s of each worker whose list contains that [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

When a browsing context is discarded, the strong reference from the user agent itself to the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) must be severed, and all the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects for all the entries in the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s session history must be [discarded](http://www.w3.org/TR/html5/browsers.html#discard-a-document) as well.

User agents may [discard](http://www.w3.org/TR/html5/browsers.html#a-browsing-context-is-discarded) [top-level browsing contexts](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) at any time (typically, in response to user requests, e.g. when a user closes a window containing one or more [top-level browsing contexts](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context)). Other [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) must be discarded once their [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object is eligible for garbage collection.

#### 5.2.6 Browser interface elements

To allow Web pages to integrate with Web browsers, certain Web browser interface elements are exposed in a limited way to scripts in Web pages.

Each interface element is represented by a [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) object:

interface BarProp {

attribute boolean [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible);

};

window . [locationbar](http://www.w3.org/TR/html5/browsers.html#dom-window-locationbar) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the location bar is visible; otherwise, returns false.

window . [menubar](http://www.w3.org/TR/html5/browsers.html#dom-window-menubar) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the menu bar is visible; otherwise, returns false.

window . [personalbar](http://www.w3.org/TR/html5/browsers.html#dom-window-personalbar) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the personal bar is visible; otherwise, returns false.

window . [scrollbars](http://www.w3.org/TR/html5/browsers.html#dom-window-scrollbars) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the scroll bars are visible; otherwise, returns false.

window . [statusbar](http://www.w3.org/TR/html5/browsers.html#dom-window-statusbar) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the status bar is visible; otherwise, returns false.

window . [toolbar](http://www.w3.org/TR/html5/browsers.html#dom-window-toolbar) . [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible)

Returns true if the toolbar is visible; otherwise, returns false.

The visible attribute, on getting, must return either true or a value determined by the user agent to most accurately represent the visibility state of the user interface element that the object represents, as described below. On setting, the new value must be discarded.

The following [BarProp](http://www.w3.org/TR/html5/browsers.html#barprop) objects exist for each [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context). Some of the user interface elements represented by these objects might have no equivalent in some user agents; for those user agents, except when otherwise specified, the object must act as if it was present and visible (i.e. its [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible) attribute must return true).

The location bar *BarProp* object

Represents the user interface element that contains a control that displays the [URL](http://www.w3.org/TR/html5/urls.html#url) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document), or some similar interface concept.

The menu bar *BarProp* object

Represents the user interface element that contains a list of commands in menu form, or some similar interface concept.

The personal bar *BarProp* object

Represents the user interface element that contains links to the user's favorite pages, or some similar interface concept.

The scrollbar *BarProp* object

Represents the user interface element that contains a scrolling mechanism, or some similar interface concept.

The status bar *BarProp* object

Represents a user interface element found immediately below or after the document, as appropriate for the user's media. If the user agent has no such user interface element, then the object may act as if the corresponding user interface element was absent (i.e. its [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible) attribute may return false).

The toolbar *BarProp* object

Represents the user interface element found immediately above or before the document, as appropriate for the user's media. If the user agent has no such user interface element, then the object may act as if the corresponding user interface element was absent (i.e. its [visible](http://www.w3.org/TR/html5/browsers.html#dom-barprop-visible) attribute may return false).

The *locationbar* attribute must return [the location bar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-location-bar-barprop-object).

The *menubar* attribute must return [the menu bar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-menu-bar-barprop-object).

The *personalbar* attribute must return [the personal bar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-personal-bar-barprop-object).

The *scrollbars* attribute must return [the scrollbar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-scrollbar-barprop-object).

The *statusbar* attribute must return [the status bar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-status-bar-barprop-object).

The *toolbar* attribute must return [the toolbar BarProp object](http://www.w3.org/TR/html5/browsers.html#the-toolbar-barprop-object).

#### 5.2.7 The [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object

As mentioned earlier, each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has a *WindowProxy* object. This object is unusual in that all operations that would be performed on it must be performed on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document) instead. It is thus indistinguishable from that [Window](http://www.w3.org/TR/html5/browsers.html#window) object in every way until the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is navigated.

There is no [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) interface object.

The [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object allows scripts to act as if each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) had a single [Window](http://www.w3.org/TR/html5/browsers.html#window) object, while still keeping separate [Window](http://www.w3.org/TR/html5/browsers.html#window) objects for each [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

In the following example, the variable x is set to the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object returned by the [window](http://www.w3.org/TR/html5/browsers.html#dom-window) accessor on the global object. All of the expressions following the assignment return true, because in every respect, the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object acts like the underlying [Window](http://www.w3.org/TR/html5/browsers.html#window) object.

var x = window;

x instanceof Window; // true

x === this; // true

## 6 Web application APIs

### 6.1 Scripting

#### 6.1.1 Introduction

Various mechanisms can cause author-provided executable code to run in the context of a document. These mechanisms include, but are probably not limited to:

* Processing of [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements.
* Processing of inline [javascript:](http://www.w3.org/TR/html5/webappapis.html#javascript-protocol) URLs (e.g. the [src](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-src) attribute of [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements, or an @import rule in a CSS [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element block).
* Event handlers, whether registered through the DOM using addEventListener(), by explicit [event handler content attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes), by [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes), or otherwise.
* Processing of technologies like XBL or SVG that have their own scripting features.

#### 6.1.2 Enabling and disabling scripting

Scripting is enabled in a [*browsing context*](http://www.w3.org/TR/html5/browsers.html#browsing-context) when all of the following conditions are true:

* The user agent supports scripting.
* The user has not disabled scripting for this [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) at this time. (User agents may provide users with the option to disable scripting globally, or in a finer-grained manner, e.g. on a per-origin basis.)
* The [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) did not have the [sandboxed scripts browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#sandboxed-scripts-browsing-context-flag) set when the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document) was created.

Scripting is disabled in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) when any of the above conditions are false (i.e. when scripting is not [enabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-script)).

Scripting is enabled for a node if the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object of the node (the node itself, if it is itself a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object) has an associated [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), and [scripting is enabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-script) in that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context).

Scripting is disabled for a node if there is no such [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), or if [scripting is disabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-noscript) in that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context).

#### 6.1.3 Processing model

##### 6.1.3.1 Definitions

A script has:

A script execution environment

The characteristics of the script execution environment depend on the language, and are not defined by this specification.

In JavaScript, the script execution environment consists of the interpreter, the stack of *execution contexts*, the *global code* and *function code* and the Function objects resulting, and so forth.

A list of code entry-points

Each code entry-point represents a block of executable code that the script exposes to other scripts and to the user agent.

Each Function object in a JavaScript [script execution environment](http://www.w3.org/TR/html5/webappapis.html#script-execution-environment) has a corresponding code entry-point, for instance.

The main program code of the script, if any, is the initial code entry-point. Typically, the code corresponding to this entry-point is executed immediately after the script is parsed.

In JavaScript, this corresponds to the execution context of the global code.

A relationship with the script's global object

An object that provides the APIs that the code can use.

This is typically a [Window](http://www.w3.org/TR/html5/browsers.html#window) object. In JavaScript, this corresponds to the *global object*.

When a [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object) is an empty object, it can't do anything that interacts with the environment.

If the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object) is a [Window](http://www.w3.org/TR/html5/browsers.html#window) object, then in JavaScript, the ThisBinding of the global execution context for this script must be the [Window](http://www.w3.org/TR/html5/browsers.html#window) object's [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object, rather than the global object. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

This is a [willful violation](http://www.w3.org/TR/html5/introduction.html#willful-violation) of the JavaScript specification current at the time of writing (ECMAScript edition 5, as defined in section 10.4.1.1 Initial Global Execution Context, step 3). The JavaScript specification requires that the this keyword in the global scope return the global object, but this is not compatible with the security design prevalent in implementations as specified herein. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

A relationship with the script's browsing context

A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) that is assigned responsibility for actions taken by the script.

When a script creates and [navigates](http://www.w3.org/TR/html5/history.html#navigate) a new [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), the [opener](http://www.w3.org/TR/html5/browsers.html#dom-opener) attribute of the new [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [Window](http://www.w3.org/TR/html5/browsers.html#window) object will be set to the [script's browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context)'s [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object.

A relationship with the script's document

A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that is assigned responsibility for actions taken by the script.

When a script [fetches](http://www.w3.org/TR/html5/fetching-resources.html#fetch) a resource, the [current address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) of the [script's document](http://www.w3.org/TR/html5/webappapis.html#script-s-document) will be used to set the Referer (sic) header.

A URL character encoding

A character encoding, set when the script is created, used to encode URLs. If the character encoding is set from another source, e.g. a [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding), then the [script's URL character encoding](http://www.w3.org/TR/html5/webappapis.html#script-s-url-character-encoding) must follow the source, so that if the source's changes, so does the script's.

A base URL

A [URL](http://www.w3.org/TR/html5/urls.html#url), set when the script is created, used to resolve relative URLs. If the base URL is set from another source, e.g. a [document base URL](http://www.w3.org/TR/html5/urls.html#document-base-url), then the [script's base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url) must follow the source, so that if the source's changes, so does the script's.

##### 6.1.3.2 Calling scripts

When a user agent is to jump to a code entry-point for a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script), for example to invoke an event listener defined in that [script](http://www.w3.org/TR/html5/webappapis.html#concept-script), the user agent must run the following steps:

1. If the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object) is a [Window](http://www.w3.org/TR/html5/browsers.html#window) object whose [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object is not [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active), then abort these steps without doing anything. The callback is not fired.
2. Set the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script) to be the [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) being invoked.
3. Make the [script execution environment](http://www.w3.org/TR/html5/webappapis.html#script-execution-environment) for the [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) execute the code for the given code entry-point.
4. Set the [entry script](http://www.w3.org/TR/html5/browsers.html#entry-script) back to whatever it was when this algorithm started.

This algorithm is not invoked by one script calling another.

##### 6.1.3.3 Creating scripts

When the specification says that a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) is to be created, given some script source, its scripting language, a global object, a browsing context, a URL character encoding, and a base URL, the user agent must run the following steps:

1. If [scripting is disabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-noscript) for [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) passed to this algorithm, then abort these steps, as if the script did nothing but return void.
2. Set up a [script execution environment](http://www.w3.org/TR/html5/webappapis.html#script-execution-environment) as appropriate for the scripting language.
3. Parse/compile/initialize the source of the script using the [script execution environment](http://www.w3.org/TR/html5/webappapis.html#script-execution-environment), as appropriate for the scripting language, and thus obtain the [list of code entry-points](http://www.w3.org/TR/html5/webappapis.html#list-of-code-entry-points) for the script. If the semantics of the scripting language and the given source code are such that there is executable code to be immediately run, then the [*initial code entry-point*](http://www.w3.org/TR/html5/webappapis.html#initial-code-entry-point) is the entry-point for that code.
4. Set up the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object), the [script's browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context), the [script's document](http://www.w3.org/TR/html5/webappapis.html#script-s-document), the [script's URL character encoding](http://www.w3.org/TR/html5/webappapis.html#script-s-url-character-encoding), and the [script's base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url) from the settings passed to this algorithm.
5. If all the steps above succeeded (in particular, if the script was compiled successfully), [Jump](http://www.w3.org/TR/html5/webappapis.html#jump-to-a-code-entry-point) to the [script](http://www.w3.org/TR/html5/webappapis.html#concept-script)'s [*initial code entry-point*](http://www.w3.org/TR/html5/webappapis.html#initial-code-entry-point).

Otherwise, [report the error](http://www.w3.org/TR/html5/webappapis.html#report-the-error) using the [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror) [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) of the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object). If the error is still [*not handled*](http://www.w3.org/TR/html5/webappapis.html#concept-error-nothandled) after this, then the error may be reported to the user.

When the user agent is to create an impotent script, given some script source, its scripting language, and a browsing context, the user agent must [create a script](http://www.w3.org/TR/html5/webappapis.html#create-a-script), using the given script source and scripting language, using a new empty object as the global object, and using the given browsing context as the browsing context. The URL character encoding and base URL for the resulting [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) are not important as no APIs are exposed to the script.

When the specification says that a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) is to be created from a node node, given some script source and its scripting language, the user agent must [create a script](http://www.w3.org/TR/html5/webappapis.html#create-a-script), using the given script source and scripting language, and using [the script settings determined from the node](http://www.w3.org/TR/html5/webappapis.html#the-script-settings-determined-from-the-node) node.

The script settings determined from the node node are computed as follows:

1. Let document be the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) of node (or node itself if it is a [Document](http://www.w3.org/TR/html5/infrastructure.html#document)).
2. The browsing context is the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) of document.
3. The global object is the [Window](http://www.w3.org/TR/html5/browsers.html#window) object of document.
4. The URL character encoding is the [character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding) of document. ([This is a reference, not a copy](http://www.w3.org/TR/html5/webappapis.html#sce-not-copy).)
5. The base URL is the [base URL](http://www.w3.org/TR/html5/urls.html#document-base-url) of document. ([This is a reference, not a copy](http://www.w3.org/TR/html5/webappapis.html#sbu-not-copy).)

##### 6.1.3.4 Killing scripts

User agents may impose resource limitations on scripts, for example CPU quotas, memory limits, total execution time limits, or bandwidth limitations. When a script exceeds a limit, the user agent may either throw a [QUOTA\_EXCEEDED\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#quota_exceeded_err) exception, abort the script without an exception, prompt the user, or throttle script execution.

For example, the following script never terminates. A user agent could, after waiting for a few seconds, prompt the user to either terminate the script or let it continue.

<script>

while (true) { /\* loop \*/ }

</script>

User agents are encouraged to allow users to disable scripting whenever the user is prompted either by a script (e.g. using the [window.alert()](http://www.w3.org/TR/html5/timers.html#dom-alert) API) or because of a script's actions (e.g. because it has exceeded a time limit).

If scripting is disabled while a script is executing, the script should be terminated immediately.

##### 6.1.3.5 Runtime script errors

Whenever an uncaught runtime script error occurs in one of the scripts associated with a [Document](http://www.w3.org/TR/html5/infrastructure.html#document), the user agent must [report the error](http://www.w3.org/TR/html5/webappapis.html#report-the-error) using the [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror) [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) of the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object). If the error is still [*not handled*](http://www.w3.org/TR/html5/webappapis.html#concept-error-nothandled) after this, then the error may be reported to the user.

When the user agent is required to report an error error using the [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) onerror, it must run these steps, after which the error is either handled or not handled:

If the value of onerror is a [Function](http://www.w3.org/TR/html5/webappapis.html#function)

The function must be invoked with three arguments. The three arguments passed to the function are all DOMStrings; the first must give the message that the UA is considering reporting, the second must give the [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) of the resource in which the error occurred, and the third must give the line number in that resource on which the error occurred.

If the function returns false, then the error is [*handled*](http://www.w3.org/TR/html5/webappapis.html#concept-error-handled). Otherwise, the error is [*not handled*](http://www.w3.org/TR/html5/webappapis.html#concept-error-nothandled).

Any uncaught exceptions thrown or errors caused by this function may be reported to the user immediately after the error that the function was called for; the [report an error](http://www.w3.org/TR/html5/webappapis.html#report-the-error) algorithm must not be used to handle exceptions thrown or errors caused by this function.

Otherwise

The error is [*not handled*](http://www.w3.org/TR/html5/webappapis.html#concept-error-nothandled).

#### 6.1.4 Event loops

##### 6.1.4.1 Definitions

To coordinate events, user interaction, scripts, rendering, networking, and so forth, user agents must use event loops as described in this section.

There must be at least one [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) per user agent, and at most one [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) per [unit of related similar-origin browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-similar-origin-browsing-contexts).

When there is more than one [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) for a [unit of related browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-browsing-contexts), complications arise when a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) in that group is [navigated](http://www.w3.org/TR/html5/history.html#navigate) such that it switches from one [unit of related similar-origin browsing contexts](http://www.w3.org/TR/html5/browsers.html#unit-of-related-similar-origin-browsing-contexts) to another. This specification does not currently describe how to handle these complications.

An [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) always has at least one [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context). If an [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop)'s [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) all go away, then the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) goes away as well. A [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) always has an [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) coordinating its activities.

Other specifications can define new kinds of event loops that aren't associated with browsing contexts; in particular, the Web Workers specification does so.

An [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) has one or more task queues. A [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue) is an ordered list of tasks, which can be:

Events

Asynchronously dispatching an [Event](http://www.w3.org/TR/html5/infrastructure.html#event) object at a particular [EventTarget](http://www.w3.org/TR/html5/infrastructure.html#eventtarget) object is a task.

Not all events are dispatched using the [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue), many are dispatched synchronously during other tasks.

Parsing

The [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) tokenizing one or more bytes, and then processing any resulting tokens, is typically a task.

Callbacks

Calling a callback asynchronously is a task.

Using a resource

When an algorithm [fetches](http://www.w3.org/TR/html5/fetching-resources.html#fetch) a resource, if the fetching occurs asynchronously then the processing of the resource once some or all of the resource is available is a task.

Reacting to DOM manipulation

Some elements have tasks that trigger in response to DOM manipulation, e.g. when that element is [inserted into the document](http://www.w3.org/TR/html5/infrastructure.html#insert-an-element-into-a-document).

When a user agent is to queue a task, it must add the given task to one of the [task queues](http://www.w3.org/TR/html5/webappapis.html#task-queue) of the relevant [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop). All the tasks from one particular task source (e.g. the callbacks generated by timers, the events dispatched for mouse movements, the tasks queued for the parser) must always be added to the same [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue), but tasks from different [task sources](http://www.w3.org/TR/html5/webappapis.html#task-source) may be placed in different [task queues](http://www.w3.org/TR/html5/webappapis.html#task-queue).

For example, a user agent could have one [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue) for mouse and key events (the [user interaction task source](http://www.w3.org/TR/html5/webappapis.html#user-interaction-task-source)), and another for everything else. The user agent could then give keyboard and mouse events preference over other tasks three quarters of the time, keeping the interface responsive but not starving other task queues, and never processing events from any one [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) out of order.

Each [task](http://www.w3.org/TR/html5/webappapis.html#concept-task) that is [queued](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) onto a [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue) of an [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) defined by this specification is associated with a [Document](http://www.w3.org/TR/html5/infrastructure.html#document); if the task was queued in the context of an element, then it is the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document); if the task was queued in the context of a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), then it is the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document) at the time the task was queued; if the task was queued by or for a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) then the document is the [script's document](http://www.w3.org/TR/html5/webappapis.html#script-s-document).

A user agent is required to have one storage mutex. This mutex is used to control access to shared state like cookies. At any one point, the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex) is either free, or owned by a particular [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) or instance of the [fetching](http://www.w3.org/TR/html5/fetching-resources.html#fetch) algorithm.

Whenever a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) calls into a [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin), and whenever a [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) calls into a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script), the user agent must release the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex).

##### 6.1.4.2 Processing model

An [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) must continually run through the following steps for as long as it exists:

1. Run the oldest [task](http://www.w3.org/TR/html5/webappapis.html#concept-task) on one of the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop)'s [task queues](http://www.w3.org/TR/html5/webappapis.html#task-queue), ignoring tasks whose associated [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s are not [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active). The user agent may pick any [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue).
2. If the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex) is now owned by the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop), release it so that it is once again free.
3. Remove that task from its [task queue](http://www.w3.org/TR/html5/webappapis.html#task-queue).
4. [Provide a stable state](http://www.w3.org/TR/html5/webappapis.html#provide-a-stable-state).
5. If necessary, update the rendering or user interface of any [Document](http://www.w3.org/TR/html5/infrastructure.html#document) or [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to reflect the current state.
6. Return to the first step of the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop).

When the user agent is to provide a stable state, if any asynchronously-running algorithms are awaiting a stable state, then the user agent must run their synchronous section and then resume running their asynchronous algorithm (if appropriate).

A [synchronous section](http://www.w3.org/TR/html5/webappapis.html#synchronous-section) never mutates the DOM, runs any script, or has any other side-effects.

Steps in [synchronous sections](http://www.w3.org/TR/html5/webappapis.html#synchronous-section) are marked with ⌛.

When an algorithm says to spin the event loop until a condition goal is met, the user agent must run the following steps:

1. Let task source be the [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) of the currently running [task](http://www.w3.org/TR/html5/webappapis.html#concept-task).
2. Stop the currently running [task](http://www.w3.org/TR/html5/webappapis.html#concept-task), allowing the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) to resume, but continue these steps asynchronously.

This causes the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) to move on to the second step of its processing model (defined above).

1. Wait until the condition goal is met.
2. [Queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to continue running these steps, using the [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) task source. Wait until this task runs before continuing these steps.
3. Return to the caller.

Some of the algorithms in this specification, for historical reasons, require the user agent to pause while running a [task](http://www.w3.org/TR/html5/webappapis.html#concept-task) until a condition goal is met. This means running the following steps:

1. If any asynchronously-running algorithms are [awaiting a stable state](http://www.w3.org/TR/html5/webappapis.html#await-a-stable-state), then run their [synchronous section](http://www.w3.org/TR/html5/webappapis.html#synchronous-section) and then resume running their asynchronous algorithm. (See the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) processing model definition above for details.)
2. If necessary, update the rendering or user interface of any [Document](http://www.w3.org/TR/html5/infrastructure.html#document) or [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) to reflect the current state.
3. Wait until the condition goal is met. While a user agent has a paused [task](http://www.w3.org/TR/html5/webappapis.html#concept-task), the corresponding [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) must not run further [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task), and any script in the currently running [task](http://www.w3.org/TR/html5/webappapis.html#concept-task) must block. User agents should remain responsive to user input while paused, however, albeit in a reduced capacity since the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) will not be doing anything.

When a user agent is to obtain the storage mutex as part of running a [task](http://www.w3.org/TR/html5/webappapis.html#concept-task), it must run through the following steps:

1. If the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex) is already owned by this [task](http://www.w3.org/TR/html5/webappapis.html#concept-task)'s [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop), then abort these steps.
2. Otherwise, [pause](http://www.w3.org/TR/html5/webappapis.html#pause) until the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex) can be taken by the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop).
3. Take ownership of the [storage mutex](http://www.w3.org/TR/html5/webappapis.html#storage-mutex).

##### 6.1.4.3 Generic task sources

The following [task sources](http://www.w3.org/TR/html5/webappapis.html#task-source) are used by a number of mostly unrelated features in this and other specifications.

The DOM manipulation task source

This [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) is used for features that react to DOM manipulations, such as things that happen asynchronously when an element is [inserted into the document](http://www.w3.org/TR/html5/infrastructure.html#insert-an-element-into-a-document).

The user interaction task source

This [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) is used for features that react to user interaction, for example keyboard or mouse input.

Asynchronous events sent in response to user input (e.g. [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) events) must be dispatched using [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) [queued](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) with the [user interaction task source](http://www.w3.org/TR/html5/webappapis.html#user-interaction-task-source). [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

The networking task source

This [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) is used for features that trigger in response to network activity.

The history traversal task source

This [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) is used to queue calls to [history.back()](http://www.w3.org/TR/html5/history.html#dom-history-back) and similar APIs.

#### 6.1.5 The javascript: URL scheme

When a [URL](http://www.w3.org/TR/html5/urls.html#url) using the javascript: scheme is dereferenced, the user agent must run the following steps:

1. Let the script source be the string obtained using the content retrieval operation defined for javascript: URLs. [[JSURL]](http://www.w3.org/TR/html5/references.html#refsJSURL)
2. Use the appropriate step from the following list:

If a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is being [navigated](http://www.w3.org/TR/html5/history.html#navigate) to a javascript: URL, and the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context) for that navigation, if any, has [scripting disabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-noscript)

Let result be void.

If a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is being [navigated](http://www.w3.org/TR/html5/history.html#navigate) to a javascript: URL, and the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of that browsing context has the [same origin](http://www.w3.org/TR/html5/origin-0.html#same-origin) as the script given by that URL

Let address be the [address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) being navigated.

If address is [about:blank](http://www.w3.org/TR/html5/fetching-resources.html#about:blank), and the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) being navigated has a [creator browsing context](http://www.w3.org/TR/html5/browsers.html#creator-browsing-context), then let address be the [address](http://www.w3.org/TR/html5/dom.html#the-document-s-address) of the [creator Document](http://www.w3.org/TR/html5/browsers.html#creator-document) instead.

[Create a script](http://www.w3.org/TR/html5/webappapis.html#create-a-script-from-a-node) from the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document), using the aforementioned script source, and assuming the scripting language is JavaScript.

Let result be the return value of the [*initial code entry-point*](http://www.w3.org/TR/html5/webappapis.html#initial-code-entry-point) of this [script](http://www.w3.org/TR/html5/webappapis.html#concept-script). If an exception was raised, let result be void instead. (The result will be void also if [scripting is disabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-noscript).)

When it comes time to [set the document's address](http://www.w3.org/TR/html5/history.html#set-the-document-s-address) in the [navigation algorithm](http://www.w3.org/TR/html5/history.html#navigate), use address as the [override URL](http://www.w3.org/TR/html5/history.html#override-url).

Otherwise

Let result be void.

1. If the result of executing the script is void (there is no return value), then the URL must be treated in a manner equivalent to an HTTP resource with an HTTP 204 No Content response.

Otherwise, the URL must be treated in a manner equivalent to an HTTP resource with a 200 OK response whose [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type) is [text/html](http://www.w3.org/TR/html5/iana.html#text-html) and whose response body is the return value converted to a string value.

Certain contexts, in particular [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements, ignore the [Content-Type metadata](http://www.w3.org/TR/html5/fetching-resources.html#content-type).

So for example a javascript: URL for a [src](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-src) attribute of an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element would be evaluated in the context of an empty object as soon as the attribute is set; it would then be sniffed to determine the image type and decoded as an image.

A javascript: URL in an [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute of an [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element would only be evaluated when the link was [followed](http://www.w3.org/TR/html5/links.html#following-hyperlinks).

The [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-src) attribute of an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element would be evaluated in the context of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element)'s own [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context); once evaluated, its return value (if it was not void) would replace that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s document, thus changing the variables visible in that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context).

#### 6.1.6 Events

##### 6.1.6.1 Event handlers

Many objects can have event handlers specified. These act as bubbling event listeners for the object on which they are specified.

An [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) can either have the value null or be set to a [Function](http://www.w3.org/TR/html5/webappapis.html#function) object. Initially, event handlers must be set to null.

Event handlers are exposed in one or two ways.

The first way, common to all event handlers, is as an [event handler IDL attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes).

The second way is as an [event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes). Event handlers on [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) and some of the event handlers on [Window](http://www.w3.org/TR/html5/browsers.html#window) objects are exposed in this way.

Event handler IDL attributes, on setting, must set the corresponding event handler to their new value, and on getting, must return whatever the current value of the corresponding event handler is (possibly null).

If an [event handler IDL attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes) exposes an [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) of an object that doesn't exist, it must always return null on getting and must do nothing on setting.

This can happen in particular for [event handler IDL attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes) on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements that do not have corresponding [Window](http://www.w3.org/TR/html5/browsers.html#window) objects.

Certain event handler IDL attributes have additional requirements, in particular the onmessage attribute of MessagePort objects.

Event handler content attributes, when specified, must contain valid JavaScript code which, when parsed, would match the FunctionBody production after automatic semicolon insertion. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

When an [event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) is set, if the element is owned by a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that is in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), and [scripting is enabled](http://www.w3.org/TR/html5/webappapis.html#concept-bc-script) for that [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), the user agent must run the following steps to create a [script](http://www.w3.org/TR/html5/webappapis.html#concept-script) after setting the content attribute to its new value:

1. Set the corresponding [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) to null.
2. Set up a [script execution environment](http://www.w3.org/TR/html5/webappapis.html#script-execution-environment) for JavaScript.
3. Let body be the [event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes)'s new value.
4. If body is not parsable as *FunctionBody* or if parsing detects an *early error* then abort these steps.

*FunctionBody* is defined in ECMAScript edition 5 section 13 Function Definition. *Early error* is defined in ECMAScript edition 5 section 16 Errors. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

1. If body begins with a Directive Prologue that contains a Use Strict Directive then let strict be true, otherwise let strict be false.

The terms "Directive Prologue" and "Use Strict Directive" are defined in ECMAScript edition 5 section 14.1 Directive Prologues and the Use Strict Directive. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

1. Using the script execution environment created above, create a function object (as defined in ECMAScript edition 5 section 13.2 Creating Function Objects), with:

Parameter list FormalParameterList

If the attribute is the [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror) attribute of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object

Let the function have three arguments, named event, source, and fileno.

Otherwise

Let the function have a single argument called event.

Function body FunctionBody

The result of parsing body above.

Lexical Environment Scope

* 1. Let Scope be the result of NewObjectEnvironment(the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document), the global environment).
  2. If the element has a [form owner](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-owner), let Scope be the result of NewObjectEnvironment(the element's [form owner](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-owner), Scope).
  3. Let Scope be the result of NewObjectEnvironment(the element's object, Scope).

NewObjectEnvironment() is defined in ECMAScript edition 5 section 10.2.2.3 NewObjectEnvironment (O, E). [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

Boolean flag Strict

The value of strict.

Let this new function be the only entry in the script's [list of code entry-points](http://www.w3.org/TR/html5/webappapis.html#list-of-code-entry-points).

1. Set up the [script's global object](http://www.w3.org/TR/html5/webappapis.html#script-s-global-object), the [script's browsing context](http://www.w3.org/TR/html5/webappapis.html#script-s-browsing-context), the [script's document](http://www.w3.org/TR/html5/webappapis.html#script-s-document), the [script's URL character encoding](http://www.w3.org/TR/html5/webappapis.html#script-s-url-character-encoding), and the [script's base URL](http://www.w3.org/TR/html5/webappapis.html#script-s-base-url) from [the script settings determined from the node](http://www.w3.org/TR/html5/webappapis.html#the-script-settings-determined-from-the-node) on which the attribute is being set.
2. Set the corresponding [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) to the aforementioned function.

When an event handler content attribute is removed, the user agent must set the corresponding [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) to null.

When an [event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) is set on an element owned by a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) that is not in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), the corresponding event handler is not changed.

All [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) on an object, whether an element or some other object, and whether set to null or to a [Function](http://www.w3.org/TR/html5/webappapis.html#function) object, must be registered as event listeners on the object when it is created, as if the addEventListener() method on the object's [EventTarget](http://www.w3.org/TR/html5/infrastructure.html#eventtarget) interface had been invoked, with the event type (type argument) equal to the type corresponding to the event handler (the event handler event type), the listener set to be a target and bubbling phase listener (useCapture argument set to false), and the event listener itself (listener argument) set to do nothing while the event handler's value is not a [Function](http://www.w3.org/TR/html5/webappapis.html#function) object, and set to invoke the [call()](http://www.w3.org/TR/html5/webappapis.html#dom-function-call) callback of the [Function](http://www.w3.org/TR/html5/webappapis.html#function) object associated with the event handler otherwise.

[Event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) therefore always fire before event listeners attached using addEventListener().

The listener argument is emphatically not the [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) itself.

The interfaces implemented by the event object do not influence whether an [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers) is triggered or not.

When an [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers)'s [Function](http://www.w3.org/TR/html5/webappapis.html#function) object is invoked, its [call()](http://www.w3.org/TR/html5/webappapis.html#dom-function-call) callback must be invoked with one argument, set to the [Event](http://www.w3.org/TR/html5/infrastructure.html#event) object of the event in question.

The handler's return value must then be processed as follows:

If the event type is mouseover

If the return value is a boolean with the value true, then the event must be canceled.

If the event object is a [BeforeUnloadEvent](http://www.w3.org/TR/html5/history.html#beforeunloadevent) object

If the return value is a string, and the event object's [returnValue](http://www.w3.org/TR/html5/history.html#dom-beforeunloadevent-returnvalue) attribute's value is the empty string, then set the [returnValue](http://www.w3.org/TR/html5/history.html#dom-beforeunloadevent-returnvalue) attribute's value to the return value.

Otherwise

If the return value is a boolean with the value false, then the event must be canceled.

The [Function](http://www.w3.org/TR/html5/webappapis.html#function) interface represents a function in the scripting language being used. It is represented in IDL as follows:

[Callback=FunctionOnly, NoInterfaceObject]

interface Function {

any [call](http://www.w3.org/TR/html5/webappapis.html#dom-function-call)(in any... arguments);

};

The *call(...)* method is the object's callback.

In JavaScript, any Function object implements this interface.

If the [Function](http://www.w3.org/TR/html5/webappapis.html#function) object is a JavaScript Function, then when it is invoked by the user agent, the user agent must set the thisArg (as defined by ECMAScript edition 5 section 10.4.3 Entering Function Code) to the [event handler](http://www.w3.org/TR/html5/webappapis.html#event-handlers)'s object. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

For example, the following document fragment:

<body onload="alert(this)" onclick="alert(this)">

...leads to an alert saying "[object Window]" when the document is loaded, and an alert saying "[object HTMLBodyElement]" whenever the user clicks something in the page.

The return value of the function affects whether the event is canceled or not: as described above, if the return value is false, the event is canceled (except for mouseover events, where the return value has to be true to cancel the event). With beforeunload events, the value is instead used to determine the message to show the user.

##### 6.1.6.2 Event handlers on elements, [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects, and [Window](http://www.w3.org/TR/html5/browsers.html#window) objects

The following are the [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) (and their corresponding [event handler event types](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type)) that must be supported by all [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements), as both content attributes and IDL attributes, and on [Document](http://www.w3.org/TR/html5/infrastructure.html#document) and [Window](http://www.w3.org/TR/html5/browsers.html#window) objects, as IDL attributes.

| [**Event handler**](http://www.w3.org/TR/html5/webappapis.html#event-handlers) | [**Event handler event type**](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type) |
| --- | --- |
| *onabort* | abort |
| *oncanplay* | [canplay](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-canplay) |
| *oncanplaythrough* | [canplaythrough](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-canplaythrough) |
| *onchange* | change |
| *onclick* | [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) |
| *oncontextmenu* | contextmenu |
| *oncuechange* | cuechange |
| *ondblclick* | dblclick |
| *ondrag* | [drag](http://www.w3.org/TR/html5/dnd.html#event-drag) |
| *ondragend* | [dragend](http://www.w3.org/TR/html5/dnd.html#event-dragend) |
| *ondragenter* | [dragenter](http://www.w3.org/TR/html5/dnd.html#event-dragenter) |
| *ondragleave* | [dragleave](http://www.w3.org/TR/html5/dnd.html#event-dragleave) |
| *ondragover* | [dragover](http://www.w3.org/TR/html5/dnd.html#event-dragover) |
| *ondragstart* | [dragstart](http://www.w3.org/TR/html5/dnd.html#event-dragstart) |
| *ondrop* | [drop](http://www.w3.org/TR/html5/dnd.html#event-drop) |
| *ondurationchange* | [durationchange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-durationchange) |
| *onemptied* | [emptied](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-emptied) |
| *onended* | [ended](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-ended) |
| *oninput* | input |
| *oninvalid* | invalid |
| *onkeydown* | keydown |
| *onkeypress* | keypress |
| *onkeyup* | keyup |
| *onloadeddata* | [loadeddata](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadeddata) |
| *onloadedmetadata* | [loadedmetadata](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadedmetadata) |
| *onloadstart* | [loadstart](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadstart) |
| *onmousedown* | mousedown |
| *onmousemove* | mousemove |
| *onmouseout* | mouseout |
| *onmouseover* | mouseover |
| *onmouseup* | mouseup |
| *onmousewheel* | mousewheel |
| *onpause* | [pause](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-pause) |
| *onplay* | [play](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-play) |
| *onplaying* | [playing](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-playing) |
| *onprogress* | [progress](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-progress) |
| *onratechange* | [ratechange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-ratechange) |
| *onreadystatechange* | [readystatechange](http://www.w3.org/TR/html5/dom.html#event-readystatechange) |
| *onreset* | reset |
| *onseeked* | [seeked](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-seeked) |
| *onseeking* | [seeking](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-seeking) |
| *onselect* | select |
| *onshow* | show |
| *onstalled* | [stalled](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-stalled) |
| *onsubmit* | submit |
| *onsuspend* | [suspend](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-suspend) |
| *ontimeupdate* | [timeupdate](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-timeupdate) |
| *onvolumechange* | [volumechange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-volumechange) |
| *onwaiting* | [waiting](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-waiting) |

The following are the [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) (and their corresponding [event handler event types](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type)) that must be supported by all [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) other than [body](http://www.w3.org/TR/html5/sections.html#the-body-element), as both content attributes and IDL attributes, and on [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects, as IDL attributes:

| [**Event handler**](http://www.w3.org/TR/html5/webappapis.html#event-handlers) | [**Event handler event type**](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type) |
| --- | --- |
| *onblur* | blur |
| *onerror* | error |
| *onfocus* | focus |
| *onload* | load |
| *onscroll* | scroll |

The following are the [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) (and their corresponding [event handler event types](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type)) that must be supported by [Window](http://www.w3.org/TR/html5/browsers.html#window) objects, as IDL attributes on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object, and with corresponding content attributes and IDL attributes exposed on the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) and [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) elements:

| [**Event handler**](http://www.w3.org/TR/html5/webappapis.html#event-handlers) | [**Event handler event type**](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type) |
| --- | --- |
| *onafterprint* | afterprint |
| *onbeforeprint* | beforeprint |
| *onbeforeunload* | beforeunload |
| *onblur* | blur |
| *onerror* | error |
| *onfocus* | focus |
| *onhashchange* | [hashchange](http://www.w3.org/TR/html5/history.html#event-hashchange) |
| *onload* | load |
| *onmessage* | message |
| *onoffline* | [offline](http://www.w3.org/TR/html5/offline.html#event-offline) |
| *ononline* | [online](http://www.w3.org/TR/html5/offline.html#event-online) |
| *onpagehide* | [pagehide](http://www.w3.org/TR/html5/history.html#event-pagehide) |
| *onpageshow* | [pageshow](http://www.w3.org/TR/html5/history.html#event-pageshow) |
| *onpopstate* | [popstate](http://www.w3.org/TR/html5/history.html#event-popstate) |
| *onredo* | redo |
| *onresize* | resize |
| *onscroll* | scroll |
| *onstorage* | storage |
| *onundo* | undo |
| *onunload* | unload |

The [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror) handler is also used for [reporting script errors](http://www.w3.org/TR/html5/webappapis.html#runtime-script-errors).

##### 6.1.6.3 Event firing

Certain operations and methods are defined as firing events on elements. For example, the [click()](http://www.w3.org/TR/html5/editing.html#dom-click) method on the [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) interface is defined as firing a [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) event on the element. [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

Firing a simple event named e means that an event with the name e, which does not bubble (except where otherwise stated) and is not cancelable (except where otherwise stated), and which uses the [Event](http://www.w3.org/TR/html5/infrastructure.html#event) interface, must be dispatched at the given target.

Firing a synthetic mouse event named e means that an event with the name e, which does not bubble (except where otherwise stated) and is not cancelable (except where otherwise stated), and which uses the [MouseEvent](http://www.w3.org/TR/html5/infrastructure.html#mouseevent) interface, must be dispatched at the given target. The event object must have its screenX, screenY, clientX, clientY, and button attributes set to 0, its ctrlKey, shiftKey, altKey, and metaKey attributes set according to the current state of the key input device, if any (false for any keys that are not available), its detail attribute set to 1, and its relatedTarget attribute set to null. The getModifierState() method on the object must return values appropriately describing the state of the key input device at the time the event is created.

Firing a *click* event means [firing a synthetic mouse event named click](http://www.w3.org/TR/html5/webappapis.html#fire-a-synthetic-mouse-event), which bubbles and is cancelable.

The default action of these events is to do nothing except where otherwise stated.

##### 6.1.6.4 Events and the [Window](http://www.w3.org/TR/html5/browsers.html#window) object

When an event is dispatched at a DOM node in a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in a [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), if the event is not a load event, the user agent must also dispatch the event to the [Window](http://www.w3.org/TR/html5/browsers.html#window), as follows:

1. In the capture phase, the event must propagate to the [Window](http://www.w3.org/TR/html5/browsers.html#window) object before propagating to any of the nodes, as if the [Window](http://www.w3.org/TR/html5/browsers.html#window) object was the parent of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in the dispatch chain.
2. In the bubble phase, the event must propagate up to the [Window](http://www.w3.org/TR/html5/browsers.html#window) object at the end of the phase, unless bubbling has been prevented, again as if the [Window](http://www.w3.org/TR/html5/browsers.html#window) object was the parent of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) in the dispatch chain.

### 6.2 Base64 utility methods

The [atob()](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-atob) and [btoa()](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-btoa) methods allow authors to transform content to and from the base64 encoding.

[Supplemental, NoInterfaceObject]

interface WindowBase64 {

DOMString [btoa](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-btoa)(in DOMString btoa);

DOMString [atob](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-atob)(in DOMString atob);

};

[Window](http://www.w3.org/TR/html5/browsers.html#window) implements [WindowBase64](http://www.w3.org/TR/html5/webappapis.html#windowbase64);

In these APIs, for mnemonic purposes, the "b" can be considered to stand for "binary", and the "a" for "ASCII". In practice, though, for primarily historical reasons, both the input and output of these functions are Unicode strings.

result = window . [btoa](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-btoa)( data )

Takes the input data, in the form of a Unicode string containing only characters in the range U+0000 to U+00FF, each representing a binary byte with values 0x00 to 0xFF respectively, and converts it to its base64 representation, which it returns.

Throws an [INVALID\_CHARACTER\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_character_err) exception if the input string contains any out-of-range characters.

result = window . [atob](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-atob)( data )

Takes the input data, in the form of a Unicode string containing base64-encoded binary data, decodes it, and returns a string consisting of characters in the range U+0000 to U+00FF, each representing a binary byte with values 0x00 to 0xFF respectively, corresponding to that binary data.

Throws an [INVALID\_CHARACTER\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_character_err) exception if the input string is not valid base64 data.

The [WindowBase64](http://www.w3.org/TR/html5/webappapis.html#windowbase64) interface adds to the [Window](http://www.w3.org/TR/html5/browsers.html#window) interface and the WorkerUtils interface (part of Web Workers).

The *btoa()* method must throw an [INVALID\_CHARACTER\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_character_err) exception if the method's first argument contains any character whose code point is greater than U+00FF. Otherwise, the user agent must convert that argument to a sequence of octets whose nth octet is the eight-bit representation of the code point of the nth character of the argument, and then must apply the base64 algorithm to that sequence of octets, and return the result. [[RFC4648]](http://www.w3.org/TR/html5/references.html#refsRFC4648)

The *atob()* method must run the following steps to parse the string passed in the method's first argument:

1. Let input be the string being parsed.
2. Let position be a pointer into input, initially pointing at the start of the string.
3. If the length of input divides by 4 leaving no remainder, then: if input ends with one or two U+003D EQUALS SIGN (=) characters, remove them from input.
4. If the length of input divides by 4 leaving a remainder of 1, throw an [INVALID\_CHARACTER\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_character_err) exception and abort these steps.
5. If input contains a character that is not in the following list of characters and character ranges, throw an [INVALID\_CHARACTER\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_character_err) exception and abort these steps:
   * U+002B PLUS SIGN (+)
   * U+002F SOLIDUS (/)
   * U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9)
   * U+0041 LATIN CAPITAL LETTER A to U+005A LATIN CAPITAL LETTER Z
   * U+0061 LATIN SMALL LETTER A to U+007A LATIN SMALL LETTER Z
6. Let output be a string, initially empty.
7. Let buffer be a buffer that can have bits appended to it, initially empty.
8. While position does not point past the end of input, run these substeps:
   * Find the character pointed to by position in the first column of the following table. Let n be the number given in the second cell of the same row.

|  |  |
| --- | --- |
| A | 0 |
| B | 1 |
| C | 2 |
| D | 3 |
| E | 4 |
| F | 5 |
| G | 6 |
| H | 7 |
| I | 8 |
| J | 9 |
| K | 10 |
| L | 11 |
| M | 12 |
| N | 13 |
| O | 14 |
| P | 15 |
| Q | 16 |
| R | 17 |
| S | 18 |
| T | 19 |
| U | 20 |
| V | 21 |
| W | 22 |
| X | 23 |
| Y | 24 |
| Z | 25 |
| a | 26 |
| b | 27 |
| c | 28 |
| d | 29 |
| e | 30 |
| f | 31 |
| g | 32 |
| h | 33 |
| i | 34 |
| j | 35 |
| k | 36 |
| l | 37 |
| m | 38 |
| n | 39 |
| o | 40 |
| p | 41 |
| q | 42 |
| r | 43 |
| s | 44 |
| t | 45 |
| u | 46 |
| v | 47 |
| w | 48 |
| x | 49 |
| y | 50 |
| z | 51 |
| 0 | 52 |
| 1 | 53 |
| 2 | 54 |
| 3 | 55 |
| 4 | 56 |
| 5 | 57 |
| 6 | 58 |
| 7 | 59 |
| 8 | 60 |
| 9 | 61 |
| + | 62 |
| / | 63 |

* + Append to buffer the six bits corresponding to number, most significant bit first.
  + If buffer has accumulated 24 bits, interpret them as three 8-bit big-endian numbers. Append the three characters with code points equal to those numbers to output, in the same order, and then empty buffer.
  + Advance position by one character.

1. If buffer is not empty, it contains either 12 or 18 bits. If it contains 12 bits, discard the last four and interpret the remaining eight as an 8-bit big-endian number. If it contains 18 bits, discard the last two and interpret the remaining 16 as two 8-bit big-endian numbers. Append the one or two characters with code points equal to those one or two numbers to output, in the same order.

The discarded bits mean that, for instance, atob("YQ") and atob("YR") both return "a".

1. Return output.

Some base64 encoders add newlines or other whitespace to their output. The [atob()](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-atob) method throws an exception if its input contains characters other than those described by the regular expression bracket expression [+/=0-9A-Za-z], so other characters need to be removed before [atob()](http://www.w3.org/TR/html5/webappapis.html#dom-windowbase64-atob) is used for decoding.

## 7 User interaction

### 7.1 The *hidden* attribute

All [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) may have the [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) content attribute set. The [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute is a [boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute). When specified on an element, it indicates that the element is not yet, or is no longer, relevant. User agents should not render elements that have the [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute specified.

In the following skeletal example, the attribute is used to hide the Web game's main screen until the user logs in:

<h1>The Example Game</h1>

<section id="login">

<h2>Login</h2>

<form>

...

<!-- calls login() once the user's credentials have been checked -->

</form>

<script>

function login() {

// switch screens

document.getElementById('login').hidden = true;

document.getElementById('game').hidden = false;

}

</script>

</section>

<section id="game" hidden>

...

</section>

The [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute must not be used to hide content that could legitimately be shown in another presentation. For example, it is incorrect to use [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) to hide panels in a tabbed dialog, because the tabbed interface is merely a kind of overflow presentation — one could equally well just show all the form controls in one big page with a scrollbar. It is similarly incorrect to use this attribute to hide content just from one presentation — if something is marked [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute), it is hidden from all presentations, including, for instance, screen readers.

Elements that are not [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) should not link to or refer to elements that are [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute).

For example, it would be incorrect to use the [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute to link to a section marked with the [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute. If the content is not applicable or relevant, then there is no reason to link to it.

It would similarly be incorrect to use the ARIA aria-describedby attribute to refer to descriptions that are themselves [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute). Hiding a section means that it is not applicable or relevant to anyone at the current time, so clearly it cannot be a valid description of content the user can interact with.

Elements in a section hidden by the [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute are still active, e.g. scripts and form controls in such sections still execute and submit respectively. Only their presentation to the user changes.

The *hidden* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

### 7.2 Activation

element . [click](http://www.w3.org/TR/html5/editing.html#dom-click)()

Acts as if the element was clicked.

Each element has a click in progress flag, initially set to false.

The *click()* method must run these steps:

1. If the element's click in progress flag is set to true, then abort these steps.
2. Set the click in progress flag on the element to true.
3. If the element has a defined [activation behavior](http://www.w3.org/TR/html5/content-models.html#activation-behavior), [run synthetic click activation steps](http://www.w3.org/TR/html5/content-models.html#run-synthetic-click-activation-steps) on the element. Otherwise, [fire a click event](http://www.w3.org/TR/html5/webappapis.html#fire-a-click-event) at the element.
4. Set the click in progress flag on the element to false.

### 7.3 Focus

When an element is *focused*, key events received by the document must be targeted at that element. There may be no element focused; when no element is focused, key events received by the document must be targeted at [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0).

User agents may track focus for each [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) or [Document](http://www.w3.org/TR/html5/infrastructure.html#document) individually, or may support only one focused element per [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) — user agents should follow platform conventions in this regard.

Which elements within a [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) currently have focus must be independent of whether or not the [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) itself has the *system focus*.

When an element is focused, the element matches the CSS :focus pseudo-class.

#### 7.3.1 Sequential focus navigation and the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute

The *tabindex* content attribute specifies whether the element is focusable, whether it can be reached using sequential focus navigation, and the relative order of the element for the purposes of sequential focus navigation. The name "tab index" comes from the common use of the "tab" key to navigate through the focusable elements. The term "tabbing" refers to moving forward through the focusable elements that can be reached using sequential focus navigation.

The [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute, if specified, must have a value that is a [valid integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-integer).

If the attribute is specified, it must be parsed using the [rules for parsing integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-integers). The attribute's values have the following meanings:

If the attribute is omitted or parsing the value returns an error

The user agent should follow platform conventions to determine if the element is to be focusable and, if so, whether the element can be reached using sequential focus navigation, and if so, what its relative order should be.

If the value is a negative integer

The user agent must allow the element to be focused, but should not allow the element to be reached using sequential focus navigation.

If the value is a zero

The user agent must allow the element to be focused, should allow the element to be reached using sequential focus navigation, and should follow platform conventions to determine the element's relative order.

If the value is greater than zero

The user agent must allow the element to be focused, should allow the element to be reached using sequential focus navigation, and should place the element in the sequential focus navigation order so that it is:

* before any focusable element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has been omitted or whose value, when parsed, returns an error,
* before any focusable element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has a value equal to or less than zero,
* after any element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has a value greater than zero but less than the value of the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute on the element,
* after any element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has a value equal to the value of the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute on the element but that is earlier in the document in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order) than the element,
* before any element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has a value equal to the value of the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute on the element but that is later in the document in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order) than the element, and
* before any element whose [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute has a value greater than the value of the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute on the element.

An element is specially focusable if the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute's definition above defines the element to be focusable.

An element that is [specially focusable](http://www.w3.org/TR/html5/editing.html#specially-focusable) but does not otherwise have an [activation behavior](http://www.w3.org/TR/html5/content-models.html#activation-behavior) defined has an [activation behavior](http://www.w3.org/TR/html5/content-models.html#activation-behavior) that does nothing.

This means that an element that is only focusable because of its [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) attribute will fire a [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) event in response to a non-mouse activation (e.g. hitting the "enter" key while the element is focused).

The *tabIndex* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the value of the [tabindex](http://www.w3.org/TR/html5/editing.html#attr-tabindex) content attribute. Its default value is 0 for elements that are focusable and −1 for elements that are not focusable.

#### 7.3.2 Focus management

An element is focusable if the user agent's default behavior allows it to be focusable or if the element is [specially focusable](http://www.w3.org/TR/html5/editing.html#specially-focusable), but only if the element is either [being rendered](http://www.w3.org/TR/html5/rendering.html#being-rendered) or is a descendant of a [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) element that [represents](http://www.w3.org/TR/html5/rendering.html#represents) [embedded content](http://www.w3.org/TR/html5/content-models.html#embedded-content).

User agents should make the following elements [focusable](http://www.w3.org/TR/html5/editing.html#focusable), unless platform conventions dictate otherwise:

* [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements that have an [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute
* [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements that have an [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href) attribute
* [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) elements that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled)
* [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute are not in the [Hidden](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#hidden-state) state and that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled)
* [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) elements that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled)
* [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled)
* [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element) elements that do not have a [disabled](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-disabled) attribute
* Elements with a [draggable](http://www.w3.org/TR/html5/dnd.html#the-draggable-attribute) attribute set, if that would enable the user agent to allow the user to begin a drag operations for those elements without the use of a pointing device
* [Editing hosts](http://www.w3.org/TR/html5/editing.html#editing-host)

In addition, each shape that is generated for an [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element should be [focusable](http://www.w3.org/TR/html5/editing.html#focusable), unless platform conventions dictate otherwise. (A single [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element can correspond to multiple shapes, since image maps can be reused with multiple images on a page.)

The user agent may also make part of a [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) element's rendering focusable, to enable the element to be opened or closed using keyboard input. However, this is distinct from the [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) or [summary](http://www.w3.org/TR/html5/interactive-elements.html#the-summary-element) element being focusable.

The focusing steps are as follows:

1. If the element is not [in a Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), or if the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has no [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context), or if the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has no [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), then abort these steps.
2. If focusing the element will remove the focus from another element, then run the [unfocusing steps](http://www.w3.org/TR/html5/editing.html#unfocusing-steps) for that element.
3. Make the element the currently focused element in its [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context).

Some elements, most notably [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element), can correspond to more than one distinct focusable area. If a particular area was indicated when the element was focused, then that is the area that must get focus; otherwise, e.g. when using the [focus()](http://www.w3.org/TR/html5/editing.html#dom-focus) method, the first such region in tree order is the one that must be focused.

1. The user agent may apply relevant platform-specific conventions for focusing widgets.

For example, some platforms select the contents of a text field when that field is focused.

1. [Fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named focus at the element.

User agents must synchronously run the [focusing steps](http://www.w3.org/TR/html5/editing.html#focusing-steps) for an element whenever the user moves the focus to a [focusable](http://www.w3.org/TR/html5/editing.html#focusable) element.

The unfocusing steps are as follows:

1. If the element is an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element, and the [change](http://www.w3.org/TR/html5/common-input-element-attributes.html#event-input-change) event applies to the element, and the element does not have a defined [activation behavior](http://www.w3.org/TR/html5/content-models.html#activation-behavior), and the user has changed the element's [value](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-value) or its list of [selected files](http://www.w3.org/TR/html5/number-state.html#concept-input-type-file-selected) while the control was focused without committing that change, then [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) that bubbles named change at the element.
2. Unfocus the element.
3. [Fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named blur at the element.

When an element that is focused stops being a [focusable](http://www.w3.org/TR/html5/editing.html#focusable) element, or stops being focused without another element being explicitly focused in its stead, the user agent should synchronously run the [focusing steps](http://www.w3.org/TR/html5/editing.html#focusing-steps) for [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0), if there is one; if there is not, then the user agent should synchronously run the [unfocusing steps](http://www.w3.org/TR/html5/editing.html#unfocusing-steps) for the affected element only.

For example, this might happen because the element is removed from its [Document](http://www.w3.org/TR/html5/infrastructure.html#document), or has a [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute added. It would also happen to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element when the element gets [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled).

#### 7.3.3 Document-level focus APIs

document . [activeElement](http://www.w3.org/TR/html5/editing.html#dom-document-activeelement)

Returns the currently focused element.

document . [hasFocus](http://www.w3.org/TR/html5/editing.html#dom-document-hasfocus)()

Returns true if the document has focus; otherwise, returns false.

window . [focus](http://www.w3.org/TR/html5/editing.html#dom-window-focus)()

Focuses the window. Use of this method is discouraged. Allow the user to control window focus instead.

window . [blur](http://www.w3.org/TR/html5/editing.html#dom-window-blur)()

Unfocuses the window. Use of this method is discouraged. Allow the user to control window focus instead.

The *activeElement* attribute on [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) objects must return the element in the document that is focused. If no element in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is focused, this must return [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0).

The *hasFocus()* method on [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) objects must return true if the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is focused, and all its [ancestor browsing contexts](http://www.w3.org/TR/html5/browsers.html#ancestor-browsing-context) are also focused, and the [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context) has the *system focus*. If the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has no [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) or if its [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) has no [top-level browsing context](http://www.w3.org/TR/html5/browsers.html#top-level-browsing-context), then the method will always return false.

The *focus()* method on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object, when invoked, provides a hint to the user agent that the script believes the user might be interested in the contents of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object on which the method was invoked.

User agents are encouraged to have this [focus()](http://www.w3.org/TR/html5/editing.html#dom-window-focus) method trigger some kind of notification.

The *blur()* method on the [Window](http://www.w3.org/TR/html5/browsers.html#window) object, when invoked, provides a hint to the user agent that the script believes the user probably is not currently interested in the contents of the [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object on which the method was invoked, but that the contents might become interesting again in the future.

User agents are encouraged to ignore calls to this [blur()](http://www.w3.org/TR/html5/editing.html#dom-window-blur) method entirely.

Historically the [focus()](http://www.w3.org/TR/html5/editing.html#dom-window-blur) and [blur()](http://www.w3.org/TR/html5/editing.html#dom-window-blur) methods actually affected the system focus, but hostile sites widely abuse this behavior to the user's detriment.

#### 7.3.4 Element-level focus APIs

element . [focus](http://www.w3.org/TR/html5/editing.html#dom-focus)()

Focuses the element.

element . [blur](http://www.w3.org/TR/html5/editing.html#dom-blur)()

Unfocuses the element. Use of this method is discouraged. Focus another element instead.

Do not use this method to hide the focus ring if you find the focus ring unsightly. Instead, use a CSS rule to override the 'outline' property.

For example, to hide the outline from links, you could use:

:link:focus, :visited:focus { outline: none; }

The *focus()* method, when invoked, must run the following algorithm:

1. If the element is marked as [*locked for focus*](http://www.w3.org/TR/html5/editing.html#locked-for-focus), then abort these steps.
2. If the element is not [focusable](http://www.w3.org/TR/html5/editing.html#focusable), then abort these steps.
3. Mark the element as locked for focus.
4. If the element is not already focused, run the [focusing steps](http://www.w3.org/TR/html5/editing.html#focusing-steps) for the element.
5. Unmark the element as [*locked for focus*](http://www.w3.org/TR/html5/editing.html#locked-for-focus).

The *blur()* method, when invoked, should run the [focusing steps](http://www.w3.org/TR/html5/editing.html#focusing-steps) for [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0), if there is one; if there is not, then it should run the [unfocusing steps](http://www.w3.org/TR/html5/editing.html#unfocusing-steps) for the element on which the method was called instead. User agents may selectively or uniformly ignore calls to this method for usability reasons.

For example, if the [blur()](http://www.w3.org/TR/html5/editing.html#dom-blur) method is unwisely being used to remove the focus ring for aesthetics reasons, the page would become unusable by keyboard users. Ignoring calls to this method would thus allow keyboard users to interact with the page.

### 7.4 Assigning keyboard shortcuts

#### 7.4.1 Introduction

*.*

Each element that can be activated or focused can be assigned a single key combination to activate it, using the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute.

The exact shortcut is determined by the user agent, based on information about the user's keyboard, what keyboard shortcuts already exist on the platform, and what other shortcuts have been specified on the page, using the information provided in the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute as a guide.

In order to ensure that a relevant keyboard shortcut is available on a wide variety of input devices, the author can provide a number of alternatives in the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute.

Each alternative consists of a single character, such as a letter or digit.

User agents can provide users with a list of the keyboard shortcuts, but authors are encouraged to do so also. The [accessKeyLabel](http://www.w3.org/TR/html5/editing.html#dom-accesskeylabel) IDL attribute returns a string representing the actual key combination assigned by the user agent.

#### 7.4.2 The accesskey attribute

All [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) may have the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) content attribute set. The [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute's value is used by the user agent as a guide for creating a keyboard shortcut that activates or focuses the element.

If specified, the value must be an [ordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#ordered-set-of-unique-space-separated-tokens) that are [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive), each of which must be exactly one Unicode code point in length.

In the following example, a variety of links are given with access keys so that keyboard users familiar with the site can more quickly navigate to the relevant pages:

<nav>

<p>

<a title="Consortium Activities" accesskey="A" href="/Consortium/activities">Activities</a> |

<a title="Technical Reports and Recommendations" accesskey="T" href="/TR/">Technical Reports</a> |

<a title="Alphabetical Site Index" accesskey="S" href="/Consortium/siteindex">Site Index</a> |

<a title="About This Site" accesskey="B" href="/Consortium/">About Consortium</a> |

<a title="Contact Consortium" accesskey="C" href="/Consortium/contact">Contact</a>

</p>

</nav>

In the following example, the search field is given two possible access keys, "s" and "0" (in that order). A user agent on a device with a full keyboard might pick Ctrl+Alt+S as the shortcut key, while a user agent on a small device with just a numeric keypad might pick just the plain unadorned key 0:

<form action="/search">

<label>Search: <input type="search" name="q" accesskey="s 0"></label>

<input type="submit">

</form>

In the following example, a button has possible access keys described. A script then tries to update the button's label to advertise the key combination the user agent selected.

<input type=submit accesskey="N @ 1" value="Compose">

...

<script>

function labelButton(button) {

if (button.accessKeyLabel)

button.value += ' (' + button.accessKeyLabel + ')';

}

var inputs = document.getElementsByTagName('input');

for (var i = 0; i < inputs.length; i += 1) {

if (inputs[i].type == "submit")

labelButton(inputs[i]);

}

</script>

On one user agent, the button's label might become "Compose (⌘N)". On another, it might become "Compose (Alt+⇧+1)". If the user agent doesn't assign a key, it will be just "Compose". The exact string depends on what the [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) is, and on how the user agent represents that key combination.

#### 7.4.3 Processing model

An element's assigned access key is a key combination derived from the element's [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) content attribute. Initially, an element must not have an [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key).

Whenever an element's [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute is set, changed, or removed, the user agent must update the element's [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) by running the following steps:

1. If the element has no [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute, then skip to the *fallback* step below.
2. Otherwise, [split the attribute's value on spaces](http://www.w3.org/TR/html5/common-microsyntaxes.html#split-a-string-on-spaces), and let keys be the resulting tokens.
3. For each value in keys in turn, in the order the tokens appeared in the attribute's value, run the following substeps:
   1. If the value is not a string exactly one Unicode code point in length, then skip the remainder of these steps for this value.
   2. If the value does not correspond to a key on the system's keyboard, then skip the remainder of these steps for this value.
   3. If the user agent can find a combination of modifier keys that, with the key that corresponds to the value given in the attribute, can be used as a shortcut key, then the user agent may assign that combination of keys as the element's [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) and abort these steps.
4. *Fallback*: Optionally, the user agent may assign a key combination of its choosing as the element's [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) and then abort these steps.
5. If this step is reached, the element has no [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key).

Once a user agent has selected and assigned an access key for an element, the user agent should not change the element's [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) unless the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) content attribute is changed or the element is moved to another [Document](http://www.w3.org/TR/html5/infrastructure.html#document).

When the user presses the key combination corresponding to the [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key) for an element, if the element [defines a command](http://www.w3.org/TR/html5/commands.html#concept-command), and the command's [Hidden State](http://www.w3.org/TR/html5/commands.html#command-facet-hiddenstate) facet is false (visible), and the command's [Disabled State](http://www.w3.org/TR/html5/commands.html#command-facet-disabledstate) facet is also false (enabled), then the user agent must trigger the [Action](http://www.w3.org/TR/html5/commands.html#command-facet-action) of the command.

User agents may expose elements that have an [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) attribute in other ways as well, e.g. in a menu displayed in response to a specific key combination.

The *accessKey* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the [accesskey](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) content attribute.

The *accessKeyLabel* IDL attribute must return a string that represents the element's [assigned access key](http://www.w3.org/TR/html5/editing.html#assigned-access-key), if any. If the element does not have one, then the IDL attribute must return the empty string.

### 7.5 The [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute

The *contenteditable* attribute is an [enumerated attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#enumerated-attribute) whose keywords are the empty string, true, and false. The empty string and the true keyword map to the *true* state. The false keyword maps to the *false* state. In addition, there is a third state, the *inherit* state, which is the *missing value default* (and the *invalid value default*).

The *true* state indicates that the element is editable. The *inherit* state indicates that the element is editable if its parent is. The *false* state indicates that the element is not editable.

Specifically, if an [HTML element](http://www.w3.org/TR/html5/infrastructure.html#html-elements) has a [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to the true state, or it has its [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to the inherit state and if its nearest ancestor [HTML element](http://www.w3.org/TR/html5/infrastructure.html#html-elements) with the [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to a state other than the inherit state has its attribute set to the true state, or if it and its ancestors all have their [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to the inherit state but the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has [designMode](http://www.w3.org/TR/html5/editing.html#designMode) enabled, then the UA must treat the element as editable (as described below).

Otherwise, either the [HTML element](http://www.w3.org/TR/html5/infrastructure.html#html-elements) has a [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to the false state, or its [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute is set to the inherit state and its nearest ancestor [HTML element](http://www.w3.org/TR/html5/infrastructure.html#html-elements) with the [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to a state other than the inherit state has its attribute set to the false state, or all its ancestors have their [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute set to the inherit state and the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) itself has [designMode](http://www.w3.org/TR/html5/editing.html#designMode) disabled; either way, the element is not editable.

element . [contentEditable](http://www.w3.org/TR/html5/editing.html#dom-contenteditable) [ = value ]

Returns "true", "false", or "inherit", based on the state of the [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) attribute.

Can be set, to change that state.

Throws a [SYNTAX\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#syntax_err) exception if the new value isn't one of those strings.

element . [isContentEditable](http://www.w3.org/TR/html5/editing.html#dom-iscontenteditable)

Returns true if the element is editable; otherwise, returns false.

The *contentEditable* IDL attribute, on getting, must return the string "true" if the content attribute is set to the true state, "false" if the content attribute is set to the false state, and "inherit" otherwise. On setting, if the new value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "inherit" then the content attribute must be removed, if the new value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "true" then the content attribute must be set to the string "true", if the new value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "false" then the content attribute must be set to the string "false", and otherwise the attribute setter must raise a [SYNTAX\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#syntax_err) exception.

The *isContentEditable* IDL attribute, on getting, must return true if the element is [editable](http://www.w3.org/TR/html5/editing.html#editable), and false otherwise.

If an element is [editable](http://www.w3.org/TR/html5/editing.html#editable) and its parent element is not, or if an element is [editable](http://www.w3.org/TR/html5/editing.html#editable) and it has no parent element, then the element is an editing host. Editable elements can be nested. Editing hosts are typically focusable and typically form part of the [tab order](http://www.w3.org/TR/html5/editing.html#attr-tabindex). An editing host can contain non-editable sections, these are handled as described below. An editing host can contain non-editable sections that contain further editing hosts.

When an editing host has focus, it must have a caret position that specifies where the current editing position is. It may also have a selection.

How the caret and selection are represented depends entirely on the UA.

#### 7.5.1 User editing actions

There are several actions that the user agent should allow the user to perform while the user is interacting with an editing host. How exactly each action is triggered is not defined for every action, but when it is not defined, suggested key bindings are provided to guide implementors.

Move the caret

User agents must allow users to move the caret to any position within an editing host, even into nested editable elements. This could be triggered as the default action of keydown events with various key identifiers and as the default action of mousedown events.

Change the selection

User agents must allow users to change the selection within an editing host, even into nested editable elements. User agents may prevent selections from being made in ways that cross from editable elements into non-editable elements (e.g. by making each non-editable descendant atomically selectable, but not allowing text selection within them). This could be triggered as the default action of keydown events with various key identifiers and as the default action of mousedown events.

Insert text

This action must be triggered as the default action of a textInput event, and may be triggered by other commands as well. It must cause the user agent to insert the specified text (given by the event object's data attribute in the case of the textInput event) at the caret.

If the caret is positioned somewhere where [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content) is not allowed (e.g. inside an empty [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) element), then the user agent must not insert the text directly at the caret position. In such cases the behavior is UA-dependent, but user agents must not, in response to a request to insert text, generate a DOM that is less conformant than the DOM prior to the request.

User agents should allow users to insert new paragraphs into elements that contains only content other than paragraphs.

For example, given the markup:

<section>

<dl>

<dt> Ben </dt>

<dd> Goat </dd>

</dl>

</section>

...the user agent should allow the user to insert [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) elements before and after the [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) element, as children of the [section](http://www.w3.org/TR/html5/sections.html#the-section-element) element.

Break block

UAs should offer a way for the user to request that the current paragraph be broken at the caret, e.g. as the default action of a keydown event whose identifier is the "Enter" key and that has no modifiers set.

The exact behavior is UA-dependent, but user agents must not, in response to a request to break a paragraph, generate a DOM that is less conformant than the DOM prior to the request.

Insert a line separator

UAs should offer a way for the user to request an explicit line break at the caret position without breaking the paragraph, e.g. as the default action of a keydown event whose identifier is the "Enter" key and that has a shift modifier set. Line separators are typically found within a poem verse or an address. To insert a line break, the user agent must insert a [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) element.

If the caret is positioned somewhere where [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content) is not allowed (e.g. in an empty [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) element), then the user agent must not insert the [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) element directly at the caret position. In such cases the behavior is UA-dependent, but user agents must not, in response to a request to insert a line separator, generate a DOM that is less conformant than the DOM prior to the request.

Delete

UAs should offer a way for the user to delete text and elements, including non-editable descendants, e.g. as the default action of keydown events whose identifiers are "U+0008" or "U+007F".

Five edge cases in particular need to be considered carefully when implementing this feature: backspacing at the start of an element, backspacing when the caret is immediately after an element, forward-deleting at the end of an element, forward-deleting when the caret is immediately before an element, and deleting a selection whose start and end points do not share a common parent node.

In any case, the exact behavior is UA-dependent, but user agents must not, in response to a request to delete text or an element, generate a DOM that is less conformant than the DOM prior to the request.

Insert, and wrap text in, semantic elements

UAs should offer the user the ability to mark text and paragraphs with semantics that HTML can express.

UAs should similarly offer a way for the user to insert empty semantic elements to subsequently fill by entering text manually.

UAs should also offer a way to remove those semantics from marked up text, and to remove empty semantic element that have been inserted.

In response to a request from a user to mark text up in italics, user agents should use the [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element) element to represent the semantic. The [em](http://www.w3.org/TR/html5/text-level-semantics.html#the-em-element) element should be used only if the user agent is sure that the user means to indicate stress emphasis.

In response to a request from a user to mark text up in bold, user agents should use the [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element) element to represent the semantic. The [strong](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element) element should be used only if the user agent is sure that the user means to indicate importance.

The exact behavior is UA-dependent, but user agents must not, in response to a request to wrap semantics around some text or to insert or remove a semantic element, generate a DOM that is less conformant than the DOM prior to the request.

Select and move non-editable elements nested inside editing hosts

UAs should offer a way for the user to move images and other non-editable parts around the content within an editing host. This may be done using the [drag and drop](http://www.w3.org/TR/html5/dnd.html#dnd) mechanism. User agents must not, in response to a request to move non-editable elements nested inside editing hosts, generate a DOM that is less conformant than the DOM prior to the request.

Edit form controls nested inside editing hosts

When an [editable](http://www.w3.org/TR/html5/editing.html#editable) form control is edited, the changes must be reflected in both its current value and its default value. For [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements this means updating the [defaultValue](http://www.w3.org/TR/html5/the-input-element.html#dom-input-defaultvalue) IDL attribute as well as the [value](http://www.w3.org/TR/html5/common-input-element-attributes.html#dom-input-value) IDL attribute; for [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) elements it means updating the [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) elements' [defaultSelected](http://www.w3.org/TR/html5/the-button-element.html#dom-option-defaultselected) IDL attribute as well as the [selected](http://www.w3.org/TR/html5/the-button-element.html#dom-option-selected) IDL attribute; for [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements this means updating the [defaultValue](http://www.w3.org/TR/html5/the-button-element.html#dom-textarea-defaultvalue) IDL attribute as well as the [value](http://www.w3.org/TR/html5/the-button-element.html#dom-textarea-value) IDL attribute. (Updating the default\* IDL attributes causes content attributes to be updated as well.)

User agents may perform several commands per user request; for example if the user selects a block of text and hits Enter, the UA might interpret that as a request to delete the content of the selection followed by a request to break the paragraph at that position.

User agents may add DOM changes entries to the undo transaction history of the [editing host](http://www.w3.org/TR/html5/editing.html#editing-host)'s [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object each time an action is triggered.

All of the actions defined above, whether triggered by the user or programmatically (e.g. by [execCommand()](http://www.w3.org/TR/html5/dnd.html#execCommand) commands), must fire mutation events as appropriate.

#### 7.5.2 Making entire documents editable

Documents have a *designMode*, which can be either enabled or disabled.

document . [designMode](http://www.w3.org/TR/html5/editing.html#designMode) [ = value ]

Returns "on" if the document is editable, and "off" if it isn't.

Can be set, to change the document's current state.

The [designMode](http://www.w3.org/TR/html5/editing.html#designMode) IDL attribute on the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object takes two values, "on" and "off". When it is set, the new value must be compared in an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) manner to these two values. If it matches the "on" value, then [designMode](http://www.w3.org/TR/html5/editing.html#designMode) must be enabled, and if it matches the "off" value, then [designMode](http://www.w3.org/TR/html5/editing.html#designMode) must be disabled. Other values must be ignored.

When [designMode](http://www.w3.org/TR/html5/editing.html#designMode) is enabled, the IDL attribute must return the value "on", and when it is disabled, it must return the value "off".

The last state set must persist until the document is destroyed or the state is changed. Initially, documents must have their [designMode](http://www.w3.org/TR/html5/editing.html#designMode) disabled.

### 7.6 Spelling and grammar checking

User agents can support the checking of spelling and grammar of editable text, either in form controls (such as the value of [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements), or in elements in an [editing host](http://www.w3.org/TR/html5/editing.html#editing-host) (using [contenteditable](http://www.w3.org/TR/html5/editing.html#attr-contenteditable)).

For each element, user agents must establish a default behavior, either through defaults or through preferences expressed by the user. There are three possible default behaviors for each element:

true-by-default

The element will be checked for spelling and grammar if its contents are editable.

false-by-default

The element will never be checked for spelling and grammar.

inherit-by-default

The element's default behavior is the same as its parent element's. Elements that have no parent element cannot have this as their default behavior.

The *spellcheck* attribute is an [enumerated attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#enumerated-attribute) whose keywords are the empty string, true and false. The empty string and the true keyword map to the *true* state. The false keyword maps to the *false* state. In addition, there is a third state, the *default* state, which is the *missing value default* (and the *invalid value default*).

The *true* state indicates that the element is to have its spelling and grammar checked. The *default* state indicates that the element is to act according to a default behavior, possibly based on the parent element's own [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) state. The *false* state indicates that the element is not to be checked.

element . [spellcheck](http://www.w3.org/TR/html5/editing.html#dom-spellcheck) [ = value ]

Returns true if the element is to have its spelling and grammar checked; otherwise, returns false.

Can be set, to override the default and set the [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute.

The *spellcheck* IDL attribute, on getting, must return true if the element's [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute is in the *true* state, or if the element's [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute is in the *default* state and the element's [default behavior](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default) is [true-by-default](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default-true), or if the element's [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute is in the *default* state and the element's [default behavior](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default) is [inherit-by-default](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default-inherit) and the element's parent element's [spellcheck](http://www.w3.org/TR/html5/editing.html#dom-spellcheck) IDL attribute would return true; otherwise, if none of those conditions applies, then the attribute must instead return false.

The [spellcheck](http://www.w3.org/TR/html5/editing.html#dom-spellcheck) IDL attribute is not affected by user preferences that override the [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute, and therefore might not reflect the actual spellchecking state.

On setting, if the new value is true, then the element's [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute must be set to the literal string "true", otherwise it must be set to the literal string "false".

User agents must only consider the following pieces of text as checkable for the purposes of this feature:

* The value of [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements to which the [readonly](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-readonly) attribute applies, whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attributes are not in the [Password](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#password-state) state, and that are not [*immutable*](http://www.w3.org/TR/html5/the-input-element.html#concept-input-immutable) (i.e. that do not have the [readonly](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-readonly) attribute specified and that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled)).
* The value of [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements that do not have a [readonly](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-readonly) attribute and that are not [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-fe-disabled).
* Text in [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node) that are children of [editable](http://www.w3.org/TR/html5/editing.html#editable) elements.
* Text in attributes of [editable](http://www.w3.org/TR/html5/editing.html#editable) elements.

For text that is part of a [text node](http://www.w3.org/TR/html5/infrastructure.html#text-node), the element with which the text is associated is the element that is the immediate parent of the first character of the word, sentence, or other piece of text. For text in attributes, it is the attribute's element. For the values of [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) and [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements, it is the element itself.

To determine if a word, sentence, or other piece of text in an applicable element (as defined above) is to have spelling- and/or grammar-checking enabled, the UA must use the following algorithm:

1. If the user has disabled the checking for this text, then the checking is disabled.
2. Otherwise, if the user has forced the checking for this text to always be enabled, then the checking is enabled.
3. Otherwise, if the element with which the text is associated has a [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute, then: if that attribute is in the *true* state, then checking is enabled; otherwise, if that attribute is in the *false* state, then checking is disabled.
4. Otherwise, if there is an ancestor element with a [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute that is not in the *default* state, then: if the nearest such ancestor's [spellcheck](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) content attribute is in the *true* state, then checking is enabled; otherwise, checking is disabled.
5. Otherwise, if the element's [default behavior](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default) is [true-by-default](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default-true), then checking is enabled.
6. Otherwise, if the element's [default behavior](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default) is [false-by-default](http://www.w3.org/TR/html5/editing.html#concept-spellcheck-default-false), then checking is disabled.
7. Otherwise, if the element's parent element has its checking enabled, then checking is enabled.
8. Otherwise, checking is disabled.

If the checking is enabled for a word/sentence/text, the user agent should indicate spelling and/or grammar errors in that text. User agents should take into account the other semantics given in the document when suggesting spelling and grammar corrections. User agents may use the language of the element to determine what spelling and grammar rules to use, or may use the user's preferred language settings. UAs should use [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element attributes such as [pattern](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-pattern) to ensure that the resulting value is valid, where possible.

If checking is disabled, the user agent should not indicate spelling or grammar errors for that text.

The element with ID "a" in the following example would be the one used to determine if the word "Hello" is checked for spelling errors. In this example, it would not be.

<div contenteditable="true">

<span spellcheck="false" id="a">Hell</span><em>o!</em>

</div>

The element with ID "b" in the following example would have checking enabled (the leading space character in the attribute's value on the [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element causes the attribute to be ignored, so the ancestor's value is used instead, regardless of the default).

<p spellcheck="true">

<label>Name: <input spellcheck=" false" id="b"></label>

</p>

This specification does not define the user interface for spelling and grammar checkers. A user agent could offer on-demand checking, could perform continuous checking while the checking is enabled, or could use other interfaces.

## 8 The HTML syntax

This section only describes the rules for resources labeled with an [HTML MIME type](http://www.w3.org/TR/html5/infrastructure.html#html-mime-type). Rules for XML resources are discussed in the section below entitled "[The XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax)".

### 8.1 Writing HTML documents

*This section only applies to documents, authoring tools, and markup generators. In particular, it does not apply to conformance checkers; conformance checkers must use the requirements given in the next section ("parsing HTML documents").*

Documents must consist of the following parts, in the given order:

1. Optionally, a single U+FEFF BYTE ORDER MARK (BOM) character.
2. Any number of [comments](http://www.w3.org/TR/html5/syntax.html#syntax-comments) and [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
3. A [DOCTYPE](http://www.w3.org/TR/html5/syntax.html#syntax-doctype).
4. Any number of [comments](http://www.w3.org/TR/html5/syntax.html#syntax-comments) and [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
5. The root element, in the form of an [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) [element](http://www.w3.org/TR/html5/syntax.html#syntax-elements).
6. Any number of [comments](http://www.w3.org/TR/html5/syntax.html#syntax-comments) and [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).

The various types of content mentioned above are described in the next few sections.

In addition, there are some restrictions on how [character encoding declarations](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration) are to be serialized, as discussed in the section on that topic.

Space characters before the root [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element, and space characters at the start of the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element and before the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element, will be dropped when the document is parsed; space characters after the root [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element will be parsed as if they were at the end of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element. Thus, space characters around the root element do not round-trip.

It is suggested that newlines be inserted after the DOCTYPE, after any comments that are before the root element, after the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element's start tag (if it is not [omitted](http://www.w3.org/TR/html5/syntax.html#syntax-tag-omission)), and after any comments that are inside the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element but before the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element.

Many strings in the HTML syntax (e.g. the names of elements and their attributes) are case-insensitive, but only for characters in the ranges U+0041 to U+005A (LATIN CAPITAL LETTER A to LATIN CAPITAL LETTER Z) and U+0061 to U+007A (LATIN SMALL LETTER A to LATIN SMALL LETTER Z). For convenience, in this section this is just referred to as "case-insensitive".

#### 8.1.1 The DOCTYPE

A DOCTYPE is a required preamble.

DOCTYPEs are required for legacy reasons. When omitted, browsers tend to use a different rendering mode that is incompatible with some specifications. Including the DOCTYPE in a document ensures that the browser makes a best-effort attempt at following the relevant specifications.

A DOCTYPE must consist of the following components, in this order:

1. A string that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "<!DOCTYPE".
2. One or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
3. A string that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "html".
4. Optionally, a [DOCTYPE legacy string](http://www.w3.org/TR/html5/syntax.html#doctype-legacy-string) or an [obsolete permitted DOCTYPE string](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype-string) (defined below).
5. Zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
6. A U+003E GREATER-THAN SIGN character (>).

In other words, <!DOCTYPE html>, case-insensitively.

For the purposes of HTML generators that cannot output HTML markup with the short DOCTYPE "<!DOCTYPE html>", a DOCTYPE legacy string may be inserted into the DOCTYPE (in the position defined above). This string must consist of:

1. One or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
2. A string that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "SYSTEM".
3. One or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
4. A U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (the *quote mark*).
5. The literal string "[about:legacy-compat](http://www.w3.org/TR/html5/urls.html#about:legacy-compat)".
6. A matching U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (i.e. the same character as in the earlier step labeled *quote mark*).

In other words, <!DOCTYPE html SYSTEM "about:legacy-compat"> or <!DOCTYPE html SYSTEM 'about:legacy-compat'>, case-insensitively except for the part in single or double quotes.

The [DOCTYPE legacy string](http://www.w3.org/TR/html5/syntax.html#doctype-legacy-string) should not be used unless the document is generated from a system that cannot output the shorter string.

To help authors transition from HTML4 and XHTML1, an obsolete permitted DOCTYPE string can be inserted into the DOCTYPE (in the position defined above). This string must consist of:

1. One or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
2. A string that is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "PUBLIC".
3. One or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
4. A U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (the *first quote mark*).
5. The string from one of the cells in the first column of the table below. The row to which this cell belongs is the *selected row*.
6. A matching U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (i.e. the same character as in the earlier step labeled *first quote mark*).
7. If the cell in the second column of the *selected row* is not blank, one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
8. If the cell in the second column of the *selected row* is not blank, a U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (the *third quote mark*).
9. If the cell in the second column of the *selected row* is not blank, the string from the cell in the second column of the *selected row*.
10. If the cell in the second column of the *selected row* is not blank, a matching U+0022 QUOTATION MARK or U+0027 APOSTROPHE character (i.e. the same character as in the earlier step labeled *third quote mark*).

| Allowed values for public and system identifiers in an [obsolete permitted DOCTYPE string](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype-string). | |
| --- | --- |
| **Public identifier** | **System identifier** |
| -//W3C//DTD HTML 4.0//EN |  |
| -//W3C//DTD HTML 4.0//EN | http://www.w3.org/TR/REC-html40/strict.dtd |
| -//W3C//DTD HTML 4.01//EN |  |
| -//W3C//DTD HTML 4.01//EN | http://www.w3.org/TR/html4/strict.dtd |
| -//W3C//DTD XHTML 1.0 Strict//EN | http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd |
| -//W3C//DTD XHTML 1.1//EN | http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd |

A [DOCTYPE](http://www.w3.org/TR/html5/syntax.html#syntax-doctype) containing an [obsolete permitted DOCTYPE string](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype-string) is an obsolete permitted DOCTYPE. Authors should not use [obsolete permitted DOCTYPEs](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype), as they are unnecessarily long.

#### 8.1.2 Elements

There are five different kinds of elements: [void elements](http://www.w3.org/TR/html5/syntax.html#void-elements), [raw text elements](http://www.w3.org/TR/html5/syntax.html#raw-text-elements), [RCDATA elements](http://www.w3.org/TR/html5/syntax.html#rcdata-elements), [foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements), and [normal elements](http://www.w3.org/TR/html5/syntax.html#normal-elements).

Void elements

[area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element), [base](http://www.w3.org/TR/html5/semantics.html#the-base-element), [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element), [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element), [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element), [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element), [link](http://www.w3.org/TR/html5/semantics.html#the-link-element), [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element), [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element), [source](http://www.w3.org/TR/html5/the-iframe-element.html#the-source-element), [track](http://www.w3.org/TR/html5/the-iframe-element.html#the-track-element), [wbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element)

Raw text elements

[script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element), [style](http://www.w3.org/TR/html5/semantics.html#the-style-element)

RCDATA elements

[textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element), [title](http://www.w3.org/TR/html5/semantics.html#the-title-element)

Foreign elements

Elements from the [MathML namespace](http://www.w3.org/TR/html5/namespaces.html#mathml-namespace) and the [SVG namespace](http://www.w3.org/TR/html5/namespaces.html#svg-namespace).

Normal elements

All other allowed [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) are normal elements.

Tags are used to delimit the start and end of elements in the markup. [Raw text](http://www.w3.org/TR/html5/syntax.html#raw-text-elements), [RCDATA](http://www.w3.org/TR/html5/syntax.html#rcdata-elements), and [normal](http://www.w3.org/TR/html5/syntax.html#normal-elements) elements have a [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) to indicate where they begin, and an [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) to indicate where they end. The start and end tags of certain [normal elements](http://www.w3.org/TR/html5/syntax.html#normal-elements) can be [omitted](http://www.w3.org/TR/html5/syntax.html#syntax-tag-omission), as described later. Those that cannot be omitted must not be omitted. [Void elements](http://www.w3.org/TR/html5/syntax.html#void-elements) only have a start tag; end tags must not be specified for [void elements](http://www.w3.org/TR/html5/syntax.html#void-elements). [Foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements) must either have a start tag and an end tag, or a start tag that is marked as self-closing, in which case they must not have an end tag.

The contents of the element must be placed between just after the start tag (which [might be implied, in certain cases](http://www.w3.org/TR/html5/syntax.html#syntax-tag-omission)) and just before the end tag (which again, [might be implied in certain cases](http://www.w3.org/TR/html5/syntax.html#syntax-tag-omission)). The exact allowed contents of each individual element depend on the content model of that element, as described earlier in this specification. Elements must not contain content that their content model disallows. In addition to the restrictions placed on the contents by those content models, however, the five types of elements have additional syntactic requirements.

[Void elements](http://www.w3.org/TR/html5/syntax.html#void-elements) can't have any contents (since there's no end tag, no content can be put between the start tag and the end tag).

[Raw text elements](http://www.w3.org/TR/html5/syntax.html#raw-text-elements) can have [text](http://www.w3.org/TR/html5/syntax.html#syntax-text), though it has [restrictions](http://www.w3.org/TR/html5/syntax.html#cdata-rcdata-restrictions) described below.

[RCDATA elements](http://www.w3.org/TR/html5/syntax.html#rcdata-elements) can have [text](http://www.w3.org/TR/html5/syntax.html#syntax-text) and [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref), but the text must not contain an [ambiguous ampersand](http://www.w3.org/TR/html5/syntax.html#syntax-ambiguous-ampersand). There are also [further restrictions](http://www.w3.org/TR/html5/syntax.html#cdata-rcdata-restrictions) described below.

[Foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements) whose start tag is marked as self-closing can't have any contents (since, again, as there's no end tag, no content can be put between the start tag and the end tag). [Foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements) whose start tag is not marked as self-closing can have [text](http://www.w3.org/TR/html5/syntax.html#syntax-text), [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref), [CDATA sections](http://www.w3.org/TR/html5/syntax.html#syntax-cdata), other [elements](http://www.w3.org/TR/html5/syntax.html#syntax-elements), and [comments](http://www.w3.org/TR/html5/syntax.html#syntax-comments), but the text must not contain the character U+003C LESS-THAN SIGN (<) or an [ambiguous ampersand](http://www.w3.org/TR/html5/syntax.html#syntax-ambiguous-ampersand).

The HTML syntax does not support namespace declarations, even in [foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements).

For instance, consider the following HTML fragment:

<p>

<svg>

<metadata>

<!-- this is invalid -->

<cdr:license xmlns:cdr="http://www.example.com/cdr/metadata" name="MIT"/>

</metadata>

</svg>

</p>

The innermost element, cdr:license, is actually in the SVG namespace, as the "xmlns:cdr" attribute has no effect (unlike in XML). In fact, as the comment in the fragment above says, the fragment is actually non-conforming. This is because the SVG specification does not define any elements called "cdr:license" in the SVG namespace.

[Normal elements](http://www.w3.org/TR/html5/syntax.html#normal-elements) can have [text](http://www.w3.org/TR/html5/syntax.html#syntax-text), [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref), other [elements](http://www.w3.org/TR/html5/syntax.html#syntax-elements), and [comments](http://www.w3.org/TR/html5/syntax.html#syntax-comments), but the text must not contain the character U+003C LESS-THAN SIGN (<) or an [ambiguous ampersand](http://www.w3.org/TR/html5/syntax.html#syntax-ambiguous-ampersand). Some [normal elements](http://www.w3.org/TR/html5/syntax.html#normal-elements) also have [yet more restrictions](http://www.w3.org/TR/html5/syntax.html#element-restrictions) on what content they are allowed to hold, beyond the restrictions imposed by the content model and those described in this paragraph. Those restrictions are described below.

Tags contain a tag name, giving the element's name. HTML elements all have names that only use characters in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), U+0061 LATIN SMALL LETTER A to U+007A LATIN SMALL LETTER Z, and U+0041 LATIN CAPITAL LETTER A to U+005A LATIN CAPITAL LETTER Z. In the HTML syntax, tag names, even those for [foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements), may be written with any mix of lower- and uppercase letters that, when converted to all-lowercase, matches the element's tag name; tag names are case-insensitive.

##### 8.1.2.1 Start tags

Start tags must have the following format:

1. The first character of a start tag must be a U+003C LESS-THAN SIGN character (<).
2. The next few characters of a start tag must be the element's [tag name](http://www.w3.org/TR/html5/syntax.html#syntax-tag-name).
3. If there are to be any attributes in the next step, there must first be one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
4. Then, the start tag may have a number of attributes, the [syntax for which](http://www.w3.org/TR/html5/syntax.html#syntax-attributes) is described below. Attributes must be separated from each other by one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
5. After the attributes, or after the [tag name](http://www.w3.org/TR/html5/syntax.html#syntax-tag-name) if there are no attributes, there may be one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character). (Some attributes are required to be followed by a space. See the [attributes section](http://www.w3.org/TR/html5/syntax.html#syntax-attributes) below.)
6. Then, if the element is one of the [void elements](http://www.w3.org/TR/html5/syntax.html#void-elements), or if the element is a [foreign element](http://www.w3.org/TR/html5/syntax.html#foreign-elements), then there may be a single U+002F SOLIDUS character (/). This character has no effect on [void elements](http://www.w3.org/TR/html5/syntax.html#void-elements), but on [foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements) it marks the start tag as self-closing.
7. Finally, start tags must be closed by a U+003E GREATER-THAN SIGN character (>).

##### 8.1.2.2 End tags

End tags must have the following format:

1. The first character of an end tag must be a U+003C LESS-THAN SIGN character (<).
2. The second character of an end tag must be a U+002F SOLIDUS character (/).
3. The next few characters of an end tag must be the element's [tag name](http://www.w3.org/TR/html5/syntax.html#syntax-tag-name).
4. After the tag name, there may be one or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).
5. Finally, end tags must be closed by a U+003E GREATER-THAN SIGN character (>).

##### 8.1.2.3 Attributes

Attributes for an element are expressed inside the element's start tag.

Attributes have a name and a value. Attribute names must consist of one or more characters other than the [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), U+0000 NULL, U+0022 QUOTATION MARK ("), U+0027 APOSTROPHE ('), U+003E GREATER-THAN SIGN (>), U+002F SOLIDUS (/), and U+003D EQUALS SIGN (=) characters, the control characters, and any characters that are not defined by Unicode. In the HTML syntax, attribute names, even those for [foreign elements](http://www.w3.org/TR/html5/syntax.html#foreign-elements), may be written with any mix of lower- and uppercase letters that are an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the attribute's name.

Attribute values are a mixture of [text](http://www.w3.org/TR/html5/syntax.html#syntax-text) and [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref), except with the additional restriction that the text cannot contain an [ambiguous ampersand](http://www.w3.org/TR/html5/syntax.html#syntax-ambiguous-ampersand).

Attributes can be specified in four different ways:

Empty attribute syntax

Just the [attribute name](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-name). The value is implicitly the empty string.

In the following example, the [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled) attribute is given with the empty attribute syntax:

<input disabled>

If an attribute using the empty attribute syntax is to be followed by another attribute, then there must be a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) separating the two.

Unquoted attribute value syntax

The [attribute name](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-name), followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a single U+003D EQUALS SIGN character, followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by the [attribute value](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-value), which, in addition to the requirements given above for attribute values, must not contain any literal [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), any U+0022 QUOTATION MARK characters ("), U+0027 APOSTROPHE characters ('), U+003D EQUALS SIGN characters (=), U+003C LESS-THAN SIGN characters (<), U+003E GREATER-THAN SIGN characters (>), or U+0060 GRAVE ACCENT characters (`), and must not be the empty string.

In the following example, the [value](http://www.w3.org/TR/html5/the-input-element.html#attr-input-value) attribute is given with the unquoted attribute value syntax:

<input value=yes>

If an attribute using the unquoted attribute syntax is to be followed by another attribute or by the optional U+002F SOLIDUS character (/) allowed in step 6 of the [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) syntax above, then there must be a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) separating the two.

Single-quoted attribute value syntax

The [attribute name](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-name), followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a single U+003D EQUALS SIGN character, followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a single U+0027 APOSTROPHE character ('), followed by the [attribute value](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-value), which, in addition to the requirements given above for attribute values, must not contain any literal U+0027 APOSTROPHE characters ('), and finally followed by a second single U+0027 APOSTROPHE character (').

In the following example, the [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is given with the single-quoted attribute value syntax:

<input type='checkbox'>

If an attribute using the single-quoted attribute syntax is to be followed by another attribute, then there must be a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) separating the two.

Double-quoted attribute value syntax

The [attribute name](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-name), followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a single U+003D EQUALS SIGN character, followed by zero or more [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character), followed by a single U+0022 QUOTATION MARK character ("), followed by the [attribute value](http://www.w3.org/TR/html5/syntax.html#syntax-attribute-value), which, in addition to the requirements given above for attribute values, must not contain any literal U+0022 QUOTATION MARK characters ("), and finally followed by a second single U+0022 QUOTATION MARK character (").

In the following example, the [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name) attribute is given with the double-quoted attribute value syntax:

<input name="be evil">

If an attribute using the double-quoted attribute syntax is to be followed by another attribute, then there must be a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) separating the two.

There must never be two or more attributes on the same start tag whose names are an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for each other.

When a [foreign element](http://www.w3.org/TR/html5/syntax.html#foreign-elements) has one of the namespaced attributes given by the local name and namespace of the first and second cells of a row from the following table, it must be written using the name given by the third cell from the same row.

| **Local name** | **Namespace** | **Attribute name** |
| --- | --- | --- |
| actuate | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:actuate |
| arcrole | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:arcrole |
| href | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:href |
| role | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:role |
| show | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:show |
| title | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:title |
| type | [XLink namespace](http://www.w3.org/TR/html5/namespaces.html#xlink-namespace) | xlink:type |
| base | [XML namespace](http://www.w3.org/TR/html5/namespaces.html#xml-namespace) | xml:base |
| lang | [XML namespace](http://www.w3.org/TR/html5/namespaces.html#xml-namespace) | xml:lang |
| space | [XML namespace](http://www.w3.org/TR/html5/namespaces.html#xml-namespace) | xml:space |
| xmlns | [XMLNS namespace](http://www.w3.org/TR/html5/namespaces.html#xmlns-namespace) | xmlns |
| xlink | [XMLNS namespace](http://www.w3.org/TR/html5/namespaces.html#xmlns-namespace) | xmlns:xlink |

No other namespaced attribute can be expressed in [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax).

##### 8.1.2.4 Optional tags

Certain tags can be omitted.

Omitting an element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) does not mean the element is not present; it is implied, but it is still there. An HTML document always has a root [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element, even if the string <html> doesn't appear anywhere in the markup.

An [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) may be omitted if the first thing inside the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element is not a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments).

An [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element is not immediately followed by a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments).

A [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) may be omitted if the element is empty, or if the first thing inside the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element is an element.

A [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) element is not immediately followed by a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) or a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments).

A [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) may be omitted if the element is empty, or if the first thing inside the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element is not a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) or a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments), except if the first thing inside the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element is a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) or [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) element.

A [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element is not immediately followed by a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments).

A [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element is immediately followed by another [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element or if there is no more content in the parent element.

A [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) element is immediately followed by another [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) element or a [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) element.

A [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) element is immediately followed by another [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) element or a [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) element, or if there is no more content in the parent element.

A [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) element is immediately followed by an [address](http://www.w3.org/TR/html5/sections.html#the-address-element), [article](http://www.w3.org/TR/html5/sections.html#the-article-element), [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element), [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element), [dir](http://www.w3.org/TR/html5/obsolete.html#dir), [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element), [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element), [footer](http://www.w3.org/TR/html5/sections.html#the-footer-element), [form](http://www.w3.org/TR/html5/forms.html#the-form-element), [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [header](http://www.w3.org/TR/html5/sections.html#the-header-element), [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element), [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element), [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element), [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element), [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element), [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element), [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element), [section](http://www.w3.org/TR/html5/sections.html#the-section-element), [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), or [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element), element, or if there is no more content in the parent element and the parent element is not an [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element.

An [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) element is immediately followed by an [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) or [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) element, or if there is no more content in the parent element.

An [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) element is immediately followed by an [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) or [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) element, or if there is no more content in the parent element.

An [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element is immediately followed by another [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element, or if there is no more content in the parent element.

An [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) element is immediately followed by another [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) element, or if it is immediately followed by an [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element, or if there is no more content in the parent element.

A [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) may be omitted if the first thing inside the [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element is a [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element, and if the element is not immediately preceded by another [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element whose [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) has been omitted. (It can't be omitted if the element is empty.)

A [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element is not immediately followed by a [space character](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character) or a [comment](http://www.w3.org/TR/html5/syntax.html#syntax-comments).

A [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element) element is immediately followed by a [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) or [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element.

A [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) element's [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) may be omitted if the first thing inside the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) element is a [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element, and if the element is not immediately preceded by a [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), or [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element whose [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) has been omitted. (It can't be omitted if the element is empty.)

A [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) element is immediately followed by a [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) or [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element, or if there is no more content in the parent element.

A [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element is immediately followed by a [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) element, or if there is no more content in the parent element.

A [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element is immediately followed by another [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element, or if there is no more content in the parent element.

A [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) element is immediately followed by a [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) or [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element, or if there is no more content in the parent element.

A [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element's [end tag](http://www.w3.org/TR/html5/syntax.html#syntax-end-tag) may be omitted if the [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element is immediately followed by a [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) or [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element, or if there is no more content in the parent element.

**However**, a [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) must never be omitted if it has any attributes.

##### 8.1.2.5 Restrictions on content models

For historical reasons, certain elements have extra restrictions beyond even the restrictions given by their content model.

A [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element must not contain [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements, even though these elements are technically allowed inside [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements according to the content models described in this specification. (If a [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element is put inside a [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) in the markup, it will in fact imply a [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) start tag before it.)

A single [newline](http://www.w3.org/TR/html5/syntax.html#syntax-newlines) may be placed immediately after the [start tag](http://www.w3.org/TR/html5/syntax.html#syntax-start-tag) of [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) and [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements. This does not affect the processing of the element. The otherwise optional [newline](http://www.w3.org/TR/html5/syntax.html#syntax-newlines) must be included if the element's contents themselves start with a [newline](http://www.w3.org/TR/html5/syntax.html#syntax-newlines) (because otherwise the leading newline in the contents would be treated like the optional newline, and ignored).

The following two [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) blocks are equivalent:

<pre>Hello</pre>

<pre>  
Hello</pre>

##### 8.1.2.6 Restrictions on the contents of raw text and RCDATA elements

The text in [raw text](http://www.w3.org/TR/html5/syntax.html#raw-text-elements) and [RCDATA elements](http://www.w3.org/TR/html5/syntax.html#rcdata-elements) must not contain any occurrences of the string "</" (U+003C LESS-THAN SIGN, U+002F SOLIDUS) followed by characters that case-insensitively match the tag name of the element followed by one of U+0009 CHARACTER TABULATION (tab), U+000A LINE FEED (LF), U+000C FORM FEED (FF), U+000D CARRIAGE RETURN (CR), U+0020 SPACE, U+003E GREATER-THAN SIGN (>), or U+002F SOLIDUS (/).

#### 8.1.3 Text

Text is allowed inside elements, attribute values, and comments. Text must consist of Unicode characters. Text must not contain U+0000 characters. Text must not contain permanently undefined Unicode characters (noncharacters). Text must not contain control characters other than [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character). Extra constraints are placed on what is and what is not allowed in text based on where the text is to be put, as described in the other sections.

##### 8.1.3.1 Newlines

Newlines in HTML may be represented either as U+000D CARRIAGE RETURN (CR) characters, U+000A LINE FEED (LF) characters, or pairs of U+000D CARRIAGE RETURN (CR), U+000A LINE FEED (LF) characters in that order.

Where [character references](http://www.w3.org/TR/html5/syntax.html#syntax-charref) are allowed, a character reference of a U+000A LINE FEED (LF) character (but not a U+000D CARRIAGE RETURN (CR) character) also represents a [newline](http://www.w3.org/TR/html5/syntax.html#syntax-newlines).

#### 8.1.4 Character references

In certain cases described in other sections, [text](http://www.w3.org/TR/html5/syntax.html#syntax-text) may be mixed with character references. These can be used to escape characters that couldn't otherwise legally be included in [text](http://www.w3.org/TR/html5/syntax.html#syntax-text).

Character references must start with a U+0026 AMPERSAND character (&). Following this, there are three possible kinds of character references:

Named character references

The ampersand must be followed by one of the names given in the [named character references](http://www.w3.org/TR/html5/named-character-references.html#named-character-references) section, using the same case. The name must be one that is terminated by a U+003B SEMICOLON character (;).

Decimal numeric character reference

The ampersand must be followed by a U+0023 NUMBER SIGN character (#), followed by one or more digits in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), representing a base-ten integer that corresponds to a Unicode code point that is allowed according to the definition below. The digits must then be followed by a U+003B SEMICOLON character (;).

Hexadecimal numeric character reference

The ampersand must be followed by a U+0023 NUMBER SIGN character (#), which must be followed by either a U+0078 LATIN SMALL LETTER X character (x) or a U+0058 LATIN CAPITAL LETTER X character (X), which must then be followed by one or more digits in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), U+0061 LATIN SMALL LETTER A to U+0066 LATIN SMALL LETTER F, and U+0041 LATIN CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER F, representing a base-sixteen integer that corresponds to a Unicode code point that is allowed according to the definition below. The digits must then be followed by a U+003B SEMICOLON character (;).

The numeric character reference forms described above are allowed to reference any Unicode code point other than U+0000, U+000D, permanently undefined Unicode characters (noncharacters), and control characters other than [space characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#space-character).

An ambiguous ampersand is a U+0026 AMPERSAND character (&) that is followed by one or more characters in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), U+0061 LATIN SMALL LETTER A to U+007A LATIN SMALL LETTER Z, and U+0041 LATIN CAPITAL LETTER A to U+005A LATIN CAPITAL LETTER Z, followed by a U+003B SEMICOLON character (;), where these characters do not match any of the names given in the [named character references](http://www.w3.org/TR/html5/named-character-references.html#named-character-references) section.

#### 8.1.5 CDATA sections

CDATA sections must consist of the following components, in this order:

1. The string "<![CDATA[".
2. Optionally, [text](http://www.w3.org/TR/html5/syntax.html#syntax-text), with the additional restriction that the text must not contain the string "]]>".
3. The string "]]>".

CDATA sections can only be used in foreign content (MathML or SVG). In this example, a CDATA section is used to escape the contents of an ms element:

<p>You can add a string to a number, but this stringifies the number:</p>

<math>

<ms><![CDATA[x<y]]></ms>

<mo>+</mo>

<mn>3</mn>

<mo>=</mo>

<ms><![CDATA[x<y3]]></ms>

</math>

#### 8.1.6 Comments

Comments must start with the four character sequence U+003C LESS-THAN SIGN, U+0021 EXCLAMATION MARK, U+002D HYPHEN-MINUS, U+002D HYPHEN-MINUS (<!--). Following this sequence, the comment may have [text](http://www.w3.org/TR/html5/syntax.html#syntax-text), with the additional restriction that the text must not start with a single U+003E GREATER-THAN SIGN character (>), nor start with a U+002D HYPHEN-MINUS character (-) followed by a U+003E GREATER-THAN SIGN (>) character, nor contain two consecutive U+002D HYPHEN-MINUS characters (--), nor end with a U+002D HYPHEN-MINUS character (-). Finally, the comment must be ended by the three character sequence U+002D HYPHEN-MINUS, U+002D HYPHEN-MINUS, U+003E GREATER-THAN SIGN (-->).

## 9 The XHTML syntax

This section only describes the rules for XML resources. Rules for [text/html](http://www.w3.org/TR/html5/iana.html#text-html) resources are discussed in the section above entitled "[The HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax)".

### 9.1 Writing XHTML documents

The syntax for using HTML with XML, whether in XHTML documents or embedded in other XML documents, is defined in the XML and Namespaces in XML specifications. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML) [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS)

This specification does not define any syntax-level requirements beyond those defined for XML proper.

XML documents may contain a DOCTYPE if desired, but this is not required to conform to this specification. This specification does not define a public or system identifier, nor provide a format DTD.

According to the XML specification, XML processors are not guaranteed to process the external DTD subset referenced in the DOCTYPE. This means, for example, that using entity references for characters in XHTML documents is unsafe if they are defined in an external file (except for &lt;, &gt;, &amp;, &quot; and &apos;).

### 9.2 Parsing XHTML documents

This section describes the relationship between XML and the DOM, with a particular emphasis on how this interacts with HTML.

An XML parser, for the purposes of this specification, is a construct that follows the rules given in the XML specification to map a string of bytes or characters into a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object.

An [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) is either associated with a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object when it is created, or creates one implicitly.

This [Document](http://www.w3.org/TR/html5/infrastructure.html#document) must then be populated with DOM nodes that represent the tree structure of the input passed to the parser, as defined by the XML specification, the Namespaces in XML specification, and the DOM Core specification. DOM mutation events must not fire for the operations that the [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) performs on the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s tree, but the user agent must act as if elements and attributes were individually appended and set respectively so as to trigger rules in this specification regarding what happens when an element is inserted into a document or has its attributes set. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML) [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS) [[DOMCORE]](http://www.w3.org/TR/html5/references.html#refsDOMCORE) [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

Between the time an element's start tag is parsed and the time either the element's end tag is parsed or the parser detects a well-formedness error, the user agent must act as if the element was in a [stack of open elements](http://www.w3.org/TR/html5/parsing.html#stack-of-open-elements).

This is used by the [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element to avoid instantiating plugins before the [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) element children have been parsed.

This specification provides the following additional information that user agents should use when retrieving an external entity: the public identifiers given in the following list all correspond to [the URL given by this link](data:application/xml-dtd;base64,PCFFTlRJVFkgVGFiICImI3g5OyI%2BPCFFTlRJVFkgTmV3TGluZSAiJiN4QTsiPjwhRU5USVRZIGV4Y2wgIiYjeDIxOyI%2BPCFFTlRJVFkgcXVvdCAiJiN4MjI7Ij48IUVOVElUWSBRVU9UICImI3gyMjsiPjwhRU5USVRZIG51bSAiJiN4MjM7Ij48IUVOVElUWSBkb2xsYXIgIiYjeDI0OyI%2BPCFFTlRJVFkgcGVyY250ICImI3gyNTsiPjwhRU5USVRZIGFtcCAiJiN4MjY7Ij48IUVOVElUWSBBTVAgIiYjeDI2OyI%2BPCFFTlRJVFkgYXBvcyAiJiN4Mjc7Ij48IUVOVElUWSBscGFyICImI3gyODsiPjwhRU5USVRZIHJwYXIgIiYjeDI5OyI%2BPCFFTlRJVFkgYXN0ICImI3gyQTsiPjwhRU5USVRZIG1pZGFzdCAiJiN4MkE7Ij48IUVOVElUWSBwbHVzICImI3gyQjsiPjwhRU5USVRZIGNvbW1hICImI3gyQzsiPjwhRU5USVRZIHBlcmlvZCAiJiN4MkU7Ij48IUVOVElUWSBzb2wgIiYjeDJGOyI%2BPCFFTlRJVFkgY29sb24gIiYjeDNBOyI%2BPCFFTlRJVFkgc2VtaSAiJiN4M0I7Ij48IUVOVElUWSBsdCAiJiN4M0M7Ij48IUVOVElUWSBMVCAiJiN4M0M7Ij48IUVOVElUWSBudmx0ICImI3gzQzsmI3gyMEQyOyI%2BPCFFTlRJVFkgZXF1YWxzICImI3gzRDsiPjwhRU5USVRZIGJuZSAiJiN4M0Q7JiN4MjBFNTsiPjwhRU5USVRZIGd0ICImI3gzRTsiPjwhRU5USVRZIEdUICImI3gzRTsiPjwhRU5USVRZIG52Z3QgIiYjeDNFOyYjeDIwRDI7Ij48IUVOVElUWSBxdWVzdCAiJiN4M0Y7Ij48IUVOVElUWSBjb21tYXQgIiYjeDQwOyI%2BPCFFTlRJVFkgbHNxYiAiJiN4NUI7Ij48IUVOVElUWSBsYnJhY2sgIiYjeDVCOyI%2BPCFFTlRJVFkgYnNvbCAiJiN4NUM7Ij48IUVOVElUWSByc3FiICImI3g1RDsiPjwhRU5USVRZIHJicmFjayAiJiN4NUQ7Ij48IUVOVElUWSBIYXQgIiYjeDVFOyI%2BPCFFTlRJVFkgbG93YmFyICImI3g1RjsiPjwhRU5USVRZIFVuZGVyQmFyICImI3g1RjsiPjwhRU5USVRZIGdyYXZlICImI3g2MDsiPjwhRU5USVRZIERpYWNyaXRpY2FsR3JhdmUgIiYjeDYwOyI%2BPCFFTlRJVFkgZmpsaWcgIiYjeDY2OyYjeDZBOyI%2BPCFFTlRJVFkgbGN1YiAiJiN4N0I7Ij48IUVOVElUWSBsYnJhY2UgIiYjeDdCOyI%2BPCFFTlRJVFkgdmVyYmFyICImI3g3QzsiPjwhRU5USVRZIHZlcnQgIiYjeDdDOyI%2BPCFFTlRJVFkgVmVydGljYWxMaW5lICImI3g3QzsiPjwhRU5USVRZIHJjdWIgIiYjeDdEOyI%2BPCFFTlRJVFkgcmJyYWNlICImI3g3RDsiPjwhRU5USVRZIG5ic3AgIiYjeEEwOyI%2BPCFFTlRJVFkgTm9uQnJlYWtpbmdTcGFjZSAiJiN4QTA7Ij48IUVOVElUWSBpZXhjbCAiJiN4QTE7Ij48IUVOVElUWSBjZW50ICImI3hBMjsiPjwhRU5USVRZIHBvdW5kICImI3hBMzsiPjwhRU5USVRZIGN1cnJlbiAiJiN4QTQ7Ij48IUVOVElUWSB5ZW4gIiYjeEE1OyI%2BPCFFTlRJVFkgYnJ2YmFyICImI3hBNjsiPjwhRU5USVRZIHNlY3QgIiYjeEE3OyI%2BPCFFTlRJVFkgRG90ICImI3hBODsiPjwhRU5USVRZIGRpZSAiJiN4QTg7Ij48IUVOVElUWSBEb3VibGVEb3QgIiYjeEE4OyI%2BPCFFTlRJVFkgdW1sICImI3hB).

* -//W3C//DTD XHTML 1.0 Transitional//EN
* -//W3C//DTD XHTML 1.1//EN
* -//W3C//DTD XHTML 1.0 Strict//EN
* -//W3C//DTD XHTML 1.0 Frameset//EN
* -//W3C//DTD XHTML Basic 1.0//EN
* -//W3C//DTD XHTML 1.1 plus MathML 2.0//EN
* -//W3C//DTD XHTML 1.1 plus MathML 2.0 plus SVG 1.1//EN
* -//W3C//DTD MathML 2.0//EN
* -//WAPFORUM//DTD XHTML Mobile 1.0//EN

Furthermore, user agents should attempt to retrieve the above external entity's content when one of the above public identifiers is used, and should not attempt to retrieve any other external entity's content.

This is not strictly a [violation](http://www.w3.org/TR/html5/introduction.html#willful-violation) of the XML specification, but it does contradict the spirit of the XML specification's requirements. This is motivated by a desire for user agents to all handle entities in an interoperable fashion without requiring any network access for handling external subsets. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)

When an [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) creates a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element, it must be marked as being ["parser-inserted"](http://www.w3.org/TR/html5/scripting-1.html#parser-inserted) and its ["force-async"](http://www.w3.org/TR/html5/scripting-1.html#force-async) flag must be unset. If the parser was originally created for the [XML fragment parsing algorithm](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-fragment-parsing-algorithm), then the element must be marked as ["already started"](http://www.w3.org/TR/html5/scripting-1.html#already-started) also. When the element's end tag is parsed, the user agent must [provide a stable state](http://www.w3.org/TR/html5/webappapis.html#provide-a-stable-state), and then [prepare](http://www.w3.org/TR/html5/scripting-1.html#prepare-a-script) the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element. If this causes there to be a [pending parsing-blocking script](http://www.w3.org/TR/html5/scripting-1.html#pending-parsing-blocking-script), then the user agent must run the following steps:

1. Block this instance of the [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser), such that the [event loop](http://www.w3.org/TR/html5/webappapis.html#event-loop) will not run [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) that invoke it.
2. [Spin the event loop](http://www.w3.org/TR/html5/webappapis.html#spin-the-event-loop) until the parser's [Document](http://www.w3.org/TR/html5/infrastructure.html#document) [has no style sheet that is blocking scripts](http://www.w3.org/TR/html5/semantics.html#has-no-style-sheet-that-is-blocking-scripts) and the [pending parsing-blocking script](http://www.w3.org/TR/html5/scripting-1.html#pending-parsing-blocking-script)'s ["ready to be parser-executed"](http://www.w3.org/TR/html5/scripting-1.html#ready-to-be-parser-executed) flag is set.
3. Unblock this instance of the [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser), such that [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) that invoke it can again be run.
4. [Execute](http://www.w3.org/TR/html5/scripting-1.html#execute-the-script-block) the [pending parsing-blocking script](http://www.w3.org/TR/html5/scripting-1.html#pending-parsing-blocking-script).
5. There is no longer a [pending parsing-blocking script](http://www.w3.org/TR/html5/scripting-1.html#pending-parsing-blocking-script).

Since the [document.write()](http://www.w3.org/TR/html5/apis-in-html-documents.html#dom-document-write) API is not available for [XML documents](http://www.w3.org/TR/html5/dom.html#xml-documents), much of the complexity in the [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) is not needed in the [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser).

Certain algorithms in this specification spoon-feed the parser characters one string at a time. In such cases, the [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) must act as it would have if faced with a single string consisting of the concatenation of all those characters.

When an [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) reaches the end of its input, it must [stop parsing](http://www.w3.org/TR/html5/the-end.html#stop-parsing), following the same rules as the [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser). An [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser) can also be [aborted](http://www.w3.org/TR/html5/the-end.html#abort-a-parser), which must again by done in the same way as for an [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser).

For the purposes of conformance checkers, if a resource is determined to be in [the XHTML syntax](http://www.w3.org/TR/html5/the-xhtml-syntax.html#the-xhtml-syntax), then it is an [XML document](http://www.w3.org/TR/html5/dom.html#xml-documents).

### 9.3 Serializing XHTML fragments

The XML fragment serialization algorithm for a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) or [Element](http://www.w3.org/TR/html5/infrastructure.html#element) node either returns a fragment of XML that represents that node or raises an exception.

For [Document](http://www.w3.org/TR/html5/infrastructure.html#document)s, the algorithm must return a string in the form of a [document entity](http://www.w3.org/TR/xml/#sec-well-formed), if none of the error cases below apply.

For [Element](http://www.w3.org/TR/html5/infrastructure.html#element)s, the algorithm must return a string in the form of an [internal general parsed entity](http://www.w3.org/TR/xml/#wf-entities), if none of the error cases below apply.

In both cases, the string returned must be XML namespace-well-formed and must be an isomorphic serialization of all of that node's child nodes, in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order). User agents may adjust prefixes and namespace declarations in the serialization (and indeed might be forced to do so in some cases to obtain namespace-well-formed XML). User agents may use a combination of regular text, character references, and CDATA sections to represent [text nodes](http://www.w3.org/TR/html5/infrastructure.html#text-node) in the DOM (and indeed might be forced to use representations that don't match the DOM's, e.g. if a [CDATASection](http://www.w3.org/TR/html5/infrastructure.html#cdatasection) node contains the string "]]>").

For [Element](http://www.w3.org/TR/html5/infrastructure.html#element)s, if any of the elements in the serialization are in no namespace, the default namespace in scope for those elements must be explicitly declared as the empty string. (This doesn't apply in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) case.) [[XML]](http://www.w3.org/TR/html5/references.html#refsXML) [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS)

For the purposes of this section, an internal general parsed entity is considered XML namespace-well-formed if a document consisting of an element with no namespace declarations whose contents are the internal general parsed entity would itself be XML namespace-well-formed.

If any of the following error cases are found in the DOM subtree being serialized, then the algorithm must raise an [INVALID\_STATE\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#invalid_state_err) exception instead of returning a string:

* A [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node with no child element nodes.
* A [DocumentType](http://www.w3.org/TR/html5/infrastructure.html#documenttype) node that has an external subset public identifier that contains characters that are not matched by the XML PubidChar production. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)
* A [DocumentType](http://www.w3.org/TR/html5/infrastructure.html#documenttype) node that has an external subset system identifier that contains both a U+0022 QUOTATION MARK (") and a U+0027 APOSTROPHE (') or that contains characters that are not matched by the XML Char production. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)
* A node with a local name containing a U+003A COLON (:).
* A node with a local name that does not match the XML Name production. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)
* An [Attr](http://www.w3.org/TR/html5/infrastructure.html#attr) node with no namespace whose local name is the lowercase string "xmlns". [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS)
* An [Element](http://www.w3.org/TR/html5/infrastructure.html#element) node with two or more attributes with the same local name and namespace.
* An [Attr](http://www.w3.org/TR/html5/infrastructure.html#attr) node, [Text](http://www.w3.org/TR/html5/infrastructure.html#text) node, [CDATASection](http://www.w3.org/TR/html5/infrastructure.html#cdatasection) node, [Comment](http://www.w3.org/TR/html5/infrastructure.html#comment-0) node, or [ProcessingInstruction](http://www.w3.org/TR/html5/infrastructure.html#processinginstruction) node whose data contains characters that are not matched by the XML Char production. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML)
* A [Comment](http://www.w3.org/TR/html5/infrastructure.html#comment-0) node whose data contains two adjacent U+002D HYPHEN-MINUS characters (-) or ends with such a character.
* A [ProcessingInstruction](http://www.w3.org/TR/html5/infrastructure.html#processinginstruction) node whose target name is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "xml".
* A [ProcessingInstruction](http://www.w3.org/TR/html5/infrastructure.html#processinginstruction) node whose target name contains a U+003A COLON (:).
* A [ProcessingInstruction](http://www.w3.org/TR/html5/infrastructure.html#processinginstruction) node whose data contains the string "?>".

These are the only ways to make a DOM unserializable. The DOM enforces all the other XML constraints; for example, trying to append two elements to a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node will raise a [HIERARCHY\_REQUEST\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#hierarchy_request_err) exception.

### 9.4 Parsing XHTML fragments

The XML fragment parsing algorithm either returns a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) or raises a [SYNTAX\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#syntax_err) exception. Given a string input and an optional context element [*context*](http://www.w3.org/TR/html5/the-end.html#concept-frag-parse-context), the algorithm is as follows:

1. Create a new [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser).
2. If there is a [*context*](http://www.w3.org/TR/html5/the-end.html#concept-frag-parse-context) element, [feed the parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#feed-the-parser) just created the string corresponding to the start tag of that element, declaring all the namespace prefixes that are in scope on that element in the DOM, as well as declaring the default namespace (if any) that is in scope on that element in the DOM.

A namespace prefix is in scope if the DOM Core lookupNamespaceURI() method on the element would return a non-null value for that prefix.

The default namespace is the namespace for which the DOM Core isDefaultNamespace() method on the element would return true.

If there is a [*context*](http://www.w3.org/TR/html5/the-end.html#concept-frag-parse-context) element, no DOCTYPE is passed to the parser, and therefore no external subset is referenced, and therefore no entities will be recognized.

1. [Feed the parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#feed-the-parser) just created the string input.
2. If there is a [*context*](http://www.w3.org/TR/html5/the-end.html#concept-frag-parse-context) element, [feed the parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#feed-the-parser) just created the string corresponding to the end tag of that element.
3. If there is an XML well-formedness or XML namespace well-formedness error, then raise a [SYNTAX\_ERR](http://www.w3.org/TR/html5/common-dom-interfaces.html#syntax_err) exception and abort these steps.
4. If there is a [*context*](http://www.w3.org/TR/html5/the-end.html#concept-frag-parse-context) element, then return the child nodes of the root element of the resulting [Document](http://www.w3.org/TR/html5/infrastructure.html#document), in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order).

Otherwise, return the children of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object, in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order).

## 10 Rendering

*User agents are not required to present HTML documents in any particular way. However, this section provides a set of suggestions for rendering HTML documents that, if followed, are likely to lead to a user experience that closely resembles the experience intended by the documents' authors. So as to avoid confusion regarding the normativity of this section, RFC2119 terms have not been used. Instead, the term "expected" is used to indicate behavior that will lead to this experience. For the purposes of conformance for user agents designated as* [*supporting the suggested default rendering*](http://www.w3.org/TR/html5/infrastructure.html#renderingUA)*, the term "expected" in this section has the same conformance implications as the RFC2119-defined term "must".*

### 10.1 Introduction

In general, user agents are expected to support CSS, and many of the suggestions in this section are expressed in CSS terms. User agents that use other presentation mechanisms can derive their expected behavior by translating from the CSS rules given in this section.

In the absence of style-layer rules to the contrary (e.g. author style sheets), user agents are expected to render an element so that it conveys to the user the meaning that the element represents, as described by this specification.

The suggestions in this section generally assume a visual output medium with a resolution of 96dpi or greater, but HTML is intended to apply to multiple media (it is a *media-independent* language). User agent implementors are encouraged to adapt the suggestions in this section to their target media.

An element is being rendered if it is [in a Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), either its parent node is itself [being rendered](http://www.w3.org/TR/html5/rendering.html#being-rendered) or it is the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, and it is not explicitly excluded from the rendering using either:

* the CSS 'display' property's 'none' value, or
* the 'visibility' property's 'collapse' value unless it is being treated as equivalent to the 'hidden' value, or
* some equivalent in other styling languages.

Just being off-screen does not mean the element is not [being rendered](http://www.w3.org/TR/html5/rendering.html#being-rendered). The presence of the [hidden](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) attribute normally means the element is not [being rendered](http://www.w3.org/TR/html5/rendering.html#being-rendered), though this might be overridden by the style sheets.

### 10.2 The CSS user agent style sheet and presentational hints

#### 10.2.1 Introduction

The CSS rules given in these subsections are, except where otherwise specified, expected to be used as part of the user-agent level style sheet defaults for all documents that contain [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements).

Some rules are intended for the author-level zero-specificity presentational hints part of the CSS cascade; these are explicitly called out as presentational hints.

Some of the rules regarding left and right margins are given here as appropriate for elements whose 'direction' property is 'ltr', and are expected to be flipped around on elements whose 'direction' property is 'rtl'. These are marked "LTR-specific".

Similarly, for the purpose of the rules marked "case-insensitive", user agents are expected to use [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) matching of attribute values rather than case-sensitive matching, even for attributes in XHTML documents.

These markings only affect the handling of attribute values, not attribute names or element names.

When the text below says that an attribute attribute on an element element maps to the pixel length property (or properties) properties, it means that if element has an attribute attribute set, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then the user agent is expected to use the parsed value as a pixel length for a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for properties.

When the text below says that an attribute attribute on an element element maps to the dimension property (or properties) properties, it means that if element has an attribute attribute set, and parsing that attribute's value using the [rules for parsing dimension values](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-dimension-values) doesn't generate an error, then the user agent is expected to use the parsed dimension as the value for a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for properties, with the value given as a pixel length if the dimension was an integer, and with the value given as a percentage if the dimension was a percentage.

#### 10.2.2 Display types

@namespace url(http://www.w3.org/1999/xhtml);

[hidden], area, base, basefont, command, datalist, head,

input[type=hidden], link, menu[type=context], meta, noembed, noframes,

param, rp, script, source, style, track, title { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

display: none;

}

address, article, aside, blockquote, body, center, dd, dir, div, dl,

dt, figure, figcaption, footer, form, h1, h2, h3, h4, h5, h6, header,

hgroup, hr, html, legend, listing, menu, nav, ol, p, plaintext, pre,

section, summary, ul, xmp { display: block; unicode-bidi: isolate; }

table { display: table; unicode-bidi: isolate; }

caption { display: table-caption; unicode-bidi: isolate; }

colgroup, colgroup[hidden] { display: table-column-group; unicode-bidi: isolate; }

col, col[hidden] { display: table-column; unicode-bidi: isolate; }

thead, thead[hidden] { display: table-header-group; unicode-bidi: isolate; }

tbody, tbody[hidden] { display: table-row-group; unicode-bidi: isolate; }

tfoot, tfoot[hidden] { display: table-footer-group; unicode-bidi: isolate; }

tr, tr[hidden] { display: table-row; unicode-bidi: isolate; }

td, th, td[hidden], th[hidden] { display: table-cell; unicode-bidi: isolate; }

colgroup[hidden], col[hidden], thead[hidden], tbody[hidden],

tfoot[hidden], tr[hidden], td[hidden], th[hidden] {

visibility: collapse;

}

li { display: list-item; unicode-bidi: isolate; }

ruby { display: ruby; }

rt { display: ruby-text; }

For the purposes of the CSS table model, the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element is expected to be treated as if it was present as many times as its [span](http://www.w3.org/TR/html5/tabular-data.html#attr-col-span) attribute [specifies](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers).

For the purposes of the CSS table model, the [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) element, if it contains no [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element, is expected to be treated as if it had as many such children as its [span](http://www.w3.org/TR/html5/tabular-data.html#attr-colgroup-span) attribute [specifies](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers).

For the purposes of the CSS table model, the [colspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-colspan) and [rowspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-rowspan) attributes on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements are expected to [provide](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) the *special knowledge* regarding cells spanning rows and columns.

For the purposes of the CSS ruby model, runs of children of [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) elements that are not [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) or [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) elements are expected to be wrapped in anonymous boxes whose 'display' property has the value 'ruby-base'. [[CSSRUBY]](http://www.w3.org/TR/html5/references.html#refsCSSRUBY)

User agents that do not support correct ruby rendering are expected to render parentheses around the text of [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) elements in the absence of [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) elements.

The user agent is expected to hide [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) elements for whom [scripting is enabled](http://www.w3.org/TR/html5/webappapis.html#concept-n-script), irrespective of CSS rules.

In [HTML documents](http://www.w3.org/TR/html5/dom.html#html-documents), the user agent is expected to hide [form](http://www.w3.org/TR/html5/forms.html#the-form-element) elements that are children of [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), or [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements, irrespective of CSS rules.

#### 10.2.3 Margins and padding

@namespace url(http://www.w3.org/1999/xhtml);

blockquote, dir, dl, figure, listing, menu, ol, p, plaintext,

pre, ul, xmp {

margin-top: 1em; margin-bottom: 1em;

}

dir dir, dir dl, dir menu, dir ol, dir ul,

dl dir, dl dl, dl menu, dl ol, dl ul,

menu dir, menu dl, menu menu, menu ol, menu ul,

ol dir, ol dl, ol menu, ol ol, ol ul,

ul dir, ul dl, ul menu, ul ol, ul ul {

margin-top: 0; margin-bottom: 0;

}

h1 { margin-top: 0.67em; margin-bottom: 0.67em; }

h2 { margin-top: 0.83em; margin-bottom: 0.83em; }

h3 { margin-top: 1.00em; margin-bottom: 1.00em; }

h4 { margin-top: 1.33em; margin-bottom: 1.33em; }

h5 { margin-top: 1.67em; margin-bottom: 1.67em; }

h6 { margin-top: 2.33em; margin-bottom: 2.33em; }

dd { margin-left: 40px; } /\* [LTR-specific](http://www.w3.org/TR/html5/rendering.html#ltr-specific): use 'margin-right' for rtl elements \*/

dir, menu, ol, ul { padding-left: 40px; } /\* [LTR-specific](http://www.w3.org/TR/html5/rendering.html#ltr-specific): use 'padding-right' for rtl elements \*/

blockquote, figure { margin-left: 40px; margin-right: 40px; }

table { border-spacing: 2px; border-collapse: separate; }

td, th { padding: 1px; }

The [article](http://www.w3.org/TR/html5/sections.html#the-article-element), [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element), [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element), and [section](http://www.w3.org/TR/html5/sections.html#the-section-element) elements are expected to affect the margins of [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) elements, based on the nesting depth. If x is a selector that matches elements that are either [article](http://www.w3.org/TR/html5/sections.html#the-article-element), [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element), [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element), or [section](http://www.w3.org/TR/html5/sections.html#the-section-element) elements, then the following rules capture what is expected:

@namespace url(http://www.w3.org/1999/xhtml);

x h1 { margin-top: 0.83em; margin-bottom: 0.83em; }

x x h1 { margin-top: 1.00em; margin-bottom: 1.00em; }

x x x h1 { margin-top: 1.33em; margin-bottom: 1.33em; }

x x x x h1 { margin-top: 1.67em; margin-bottom: 1.67em; }

x x x x x h1 { margin-top: 2.33em; margin-bottom: 2.33em; }

For each property in the table below, given a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element, the first attribute that exists [maps to the pixel length property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-pixel-length-property) on the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element. If none of the attributes for a property are found, or if the value of the attribute that was found cannot be parsed successfully, then a default value of 8px is expected to be used for that property instead.

| **Property** | **Source** |
| --- | --- |
| 'margin-top' | [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [marginheight](http://www.w3.org/TR/html5/obsolete.html#attr-body-marginheight) attribute |
| The [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [container frame element](http://www.w3.org/TR/html5/rendering.html#container-frame-element)'s [marginheight](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginheight) attribute |
| [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's topmargin attribute |
| 'margin-right' | [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [marginwidth](http://www.w3.org/TR/html5/obsolete.html#attr-body-marginwidth) attribute |
| The [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [container frame element](http://www.w3.org/TR/html5/rendering.html#container-frame-element)'s [marginwidth](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginwidth) attribute |
| [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's rightmargin attribute |
| 'margin-bottom' | [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [marginheight](http://www.w3.org/TR/html5/obsolete.html#attr-body-marginheight) attribute |
| The [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [container frame element](http://www.w3.org/TR/html5/rendering.html#container-frame-element)'s [marginheight](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginheight) attribute |
| [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's bottommargin attribute |
| 'margin-left' | [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [marginwidth](http://www.w3.org/TR/html5/obsolete.html#attr-body-marginwidth) attribute |
| The [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [container frame element](http://www.w3.org/TR/html5/rendering.html#container-frame-element)'s [marginwidth](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginwidth) attribute |
| [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's leftmargin attribute |

If the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context), and the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) of that [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) is a [frame](http://www.w3.org/TR/html5/obsolete.html#frame) or [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, then the container frame element of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element is that [frame](http://www.w3.org/TR/html5/obsolete.html#frame) or [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element. Otherwise, there is no [container frame element](http://www.w3.org/TR/html5/rendering.html#container-frame-element).

The above requirements imply that a page can change the margins of another page (including one from another [origin](http://www.w3.org/TR/html5/origin-0.html#origin)) using, for example, an [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element). This is potentially a security risk, as it might in some cases allow an attack to contrive a situation in which a page is rendered not as the author intended, possibly for the purposes of phishing or otherwise misleading the user.

If the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) has a [root element](http://www.w3.org/TR/html5/infrastructure.html#root-element), and the [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context), and the [browsing context container](http://www.w3.org/TR/html5/browsers.html#browsing-context-container) of that [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) is a [frame](http://www.w3.org/TR/html5/obsolete.html#frame) or [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, and that element has a scrolling attribute, then the user agent is expected to compare the value of the attribute in an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) manner to the values in the first column of the following table, and if one of them matches, then the user agent is expected to treat that attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the aforementioned root element's 'overflow' property, setting it to the value given in the corresponding cell on the same row in the second column:

| **Attribute value** | **'overflow' value** |
| --- | --- |
| on | 'scroll' |
| scroll | 'scroll' |
| yes | 'scroll' |
| off | 'hidden' |
| noscroll | 'hidden' |
| no | 'hidden' |
| auto | 'auto' |

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's [cellspacing](http://www.w3.org/TR/html5/obsolete.html#attr-table-cellspacing) attribute [maps to the pixel length property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-pixel-length-property) 'border-spacing' on the element.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's [cellpadding](http://www.w3.org/TR/html5/obsolete.html#attr-table-cellpadding) attribute [maps to the pixel length properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-pixel-length-property) 'padding-top', 'padding-right', 'padding-bottom', and 'padding-left' of any [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements that have corresponding [cells](http://www.w3.org/TR/html5/tabular-data.html#concept-cell) in the [table](http://www.w3.org/TR/html5/tabular-data.html#concept-table) corresponding to the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's hspace attribute [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-left' and 'margin-right' on the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's vspace attribute [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-top' and 'margin-bottom' on the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's height attribute [maps to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'height' on the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's [width](http://www.w3.org/TR/html5/obsolete.html#attr-table-width) attribute [maps to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' on the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element.

The [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element's [width](http://www.w3.org/TR/html5/obsolete.html#attr-col-width) attribute [maps to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' on the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element.

The [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element's height attribute [maps to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'height' on the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element.

The [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements' [height](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-height) attributes [map to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'height' on the element.

The [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements' [width](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-width) attributes [map to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' on the element.

In [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode), the following rules are also expected to apply:

@namespace url(http://www.w3.org/1999/xhtml);

form { margin-bottom: 1em; }

When a [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is in [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode), margins on [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements) at the top or bottom of [body](http://www.w3.org/TR/html5/sections.html#the-body-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), or [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements are expected to be collapsed to zero.

#### 10.2.4 Alignment

@namespace url(http://www.w3.org/1999/xhtml);

thead, tbody, tfoot, table > tr { vertical-align: middle; }

tr, td, th { vertical-align: inherit; }

sub { vertical-align: sub; }

sup { vertical-align: super; }

The following rules are also expected to apply, as [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints):

@namespace url(http://www.w3.org/1999/xhtml);

table[align=left] { float: left; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

table[align=right] { float: right; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

table[align=center], table[align=abscenter],

table[align=absmiddle], table[align=middle] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

margin-left: auto; margin-right: auto;

}

thead[align=absmiddle], tbody[align=absmiddle], tfoot[align=absmiddle],

tr[align=absmiddle], td[align=absmiddle], th[align=absmiddle] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

text-align: center;

}

caption[align=bottom] { caption-side: bottom; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

p[align=left], h1[align=left], h2[align=left], h3[align=left],

h4[align=left], h5[align=left], h6[align=left] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

text-align: left;

}

p[align=right], h1[align=right], h2[align=right], h3[align=right],

h4[align=right], h5[align=right], h6[align=right] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

text-align: right;

}

p[align=center], h1[align=center], h2[align=center], h3[align=center],

h4[align=center], h5[align=center], h6[align=center] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

text-align: center;

}

p[align=justify], h1[align=justify], h2[align=justify], h3[align=justify],

h4[align=justify], h5[align=justify], h6[align=justify] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

text-align: justify;

}

thead[valign=top], tbody[valign=top], tfoot[valign=top],

tr[valign=top], td[valign=top], th[valign=top] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: top;

}

thead[valign=middle], tbody[valign=middle], tfoot[valign=middle],

tr[valign=middle], td[valign=middle], th[valign=middle] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: middle;

}

thead[valign=bottom], tbody[valign=bottom], tfoot[valign=bottom],

tr[valign=bottom], td[valign=bottom], th[valign=bottom] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: bottom;

}

thead[valign=baseline], tbody[valign=baseline], tfoot[valign=baseline],

tr[valign=baseline], td[valign=baseline], th[valign=baseline] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: baseline;

}

The [center](http://www.w3.org/TR/html5/obsolete.html#center) element, the [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element) element unless specified otherwise below, and the [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements when they have an [align](http://www.w3.org/TR/html5/obsolete.html#attr-div-align) attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for either the string "center" or the string "middle", are expected to center text within themselves, as if they had their 'text-align' property set to 'center' in a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints), and to [align descendants](http://www.w3.org/TR/html5/rendering.html#align-descendants) to the center.

The [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements, when they have an align attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "left", are expected to left-align text within themselves, as if they had their 'text-align' property set to 'left' in a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints), and to [align descendants](http://www.w3.org/TR/html5/rendering.html#align-descendants) to the left.

The [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements, when they have an align attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "right", are expected to right-align text within themselves, as if they had their 'text-align' property set to 'right' in a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints), and to [align descendants](http://www.w3.org/TR/html5/rendering.html#align-descendants) to the right.

The [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements, when they have an align attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "justify", are expected to full-justify text within themselves, as if they had their 'text-align' property set to 'justify' in a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints), and to [align descendants](http://www.w3.org/TR/html5/rendering.html#align-descendants) to the left.

When a user agent is to align descendants of a node, the user agent is expected to align only those descendants that have both their 'margin-left' and 'margin-right' properties computing to a value other than 'auto', that are over-constrained and that have one of those two margins with a used value forced to a greater value, and that do not themselves have an applicable align attribute. When multiple elements are to [align](http://www.w3.org/TR/html5/rendering.html#align-descendants) a particular descendant, the most deeply nested such element is expected to override the others.

User agents are expected to have a rule in their user agent stylesheet that matches [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements that have a parent node whose computed value for the 'text-align' property is its initial value, whose declaration block consists of just a single declaration that sets the 'text-align' property to the value 'center'.

#### 10.2.5 Fonts and colors

@namespace url(http://www.w3.org/1999/xhtml);

address, cite, dfn, em, i, var { font-style: italic; }

b, strong, th { font-weight: bold; }

code, kbd, listing, plaintext, pre, samp, tt, xmp { font-family: monospace; }

h1 { font-size: 2.00em; font-weight: bold; }

h2 { font-size: 1.50em; font-weight: bold; }

h3 { font-size: 1.17em; font-weight: bold; }

h4 { font-size: 1.00em; font-weight: bold; }

h5 { font-size: 0.83em; font-weight: bold; }

h6 { font-size: 0.67em; font-weight: bold; }

big { font-size: larger; }

small, sub, sup { font-size: smaller; }

sub, sup { line-height: normal; }

:link { color: blue; }

:visited { color: purple; }

mark { background: yellow; color: black; }

table, td, th { border-color: gray; }

thead, tbody, tfoot, tr { border-color: inherit; }

table[rules=none], table[rules=groups], table[rules=rows],

table[rules=cols], table[rules=all], table[frame=void],

table[frame=above], table[frame=below], table[frame=hsides],

table[frame=lhs], table[frame=rhs], table[frame=vsides],

table[frame=box], table[frame=border],

table[rules=none] > tr > td, table[rules=none] > tr > th,

table[rules=groups] > tr > td, table[rules=groups] > tr > th,

table[rules=rows] > tr > td, table[rules=rows] > tr > th,

table[rules=cols] > tr > td, table[rules=cols] > tr > th,

table[rules=all] > tr > td, table[rules=all] > tr > th,

table[rules=none] > thead > tr > td, table[rules=none] > thead > tr > th,

table[rules=groups] > thead > tr > td, table[rules=groups] > thead > tr > th,

table[rules=rows] > thead > tr > td, table[rules=rows] > thead > tr > th,

table[rules=cols] > thead > tr > td, table[rules=cols] > thead > tr > th,

table[rules=all] > thead > tr > td, table[rules=all] > thead > tr > th,

table[rules=none] > tbody > tr > td, table[rules=none] > tbody > tr > th,

table[rules=groups] > tbody > tr > td, table[rules=groups] > tbody > tr > th,

table[rules=rows] > tbody > tr > td, table[rules=rows] > tbody > tr > th,

table[rules=cols] > tbody > tr > td, table[rules=cols] > tbody > tr > th,

table[rules=all] > tbody > tr > td, table[rules=all] > tbody > tr > th,

table[rules=none] > tfoot > tr > td, table[rules=none] > tfoot > tr > th,

table[rules=groups] > tfoot > tr > td, table[rules=groups] > tfoot > tr > th,

table[rules=rows] > tfoot > tr > td, table[rules=rows] > tfoot > tr > th,

table[rules=cols] > tfoot > tr > td, table[rules=cols] > tfoot > tr > th,

table[rules=all] > tfoot > tr > td, table[rules=all] > tfoot > tr > th { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

border-color: black;

}

The initial value for the 'color' property is expected to be black. The initial value for the 'background-color' property is expected to be 'transparent'. The canvas' background is expected to be white.

The [article](http://www.w3.org/TR/html5/sections.html#the-article-element), [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element), [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element), and [section](http://www.w3.org/TR/html5/sections.html#the-section-element) elements are expected to affect the font size of [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) elements, based on the nesting depth. If x is a selector that matches elements that are either [article](http://www.w3.org/TR/html5/sections.html#the-article-element), [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element), [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element), or [section](http://www.w3.org/TR/html5/sections.html#the-section-element) elements, then the following rules capture what is expected:

@namespace url(http://www.w3.org/1999/xhtml);

x h1 { font-size: 1.50em; }

x x h1 { font-size: 1.17em; }

x x x h1 { font-size: 1.00em; }

x x x x h1 { font-size: 0.83em; }

x x x x x h1 { font-size: 0.67em; }

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element), [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), or [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element has a [background](http://www.w3.org/TR/html5/obsolete.html#attr-background) attribute set to a non-empty value, the new value is expected to be [resolved](http://www.w3.org/TR/html5/urls.html#resolve-a-url) relative to the element, and if this is successful, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'background-image' property to the resulting [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url).

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element), [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), or [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element has a bgcolor attribute set, the new value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'background-color' property to the resulting color.

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element has a [text](http://www.w3.org/TR/html5/obsolete.html#attr-body-text) attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'color' property to the resulting color.

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element has a [link](http://www.w3.org/TR/html5/obsolete.html#attr-body-link) attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the 'color' property of any element in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) matching the ':link' pseudo-class to the resulting color.

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element has a [vlink](http://www.w3.org/TR/html5/obsolete.html#attr-body-vlink) attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the 'color' property of any element in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) matching the ':visited' pseudo-class to the resulting color.

When a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element has a [alink](http://www.w3.org/TR/html5/obsolete.html#attr-body-alink) attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the 'color' property of any element in the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) matching the ':active' pseudo-class and either the ':link' pseudo-class or the ':visited' pseudo-class to the resulting color.

When a [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element has a bordercolor attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'border-top-color', 'border-right-color', 'border-bottom-color', and 'border-right-color' properties to the resulting color.

When a [font](http://www.w3.org/TR/html5/obsolete.html#font) element has a color attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'color' property to the resulting color.

When a [font](http://www.w3.org/TR/html5/obsolete.html#font) element has a face attribute, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'font-family' property to the attribute's value.

When a [font](http://www.w3.org/TR/html5/obsolete.html#font) element has a size attribute, the user agent is expected to use the following steps to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'font-size' property:

1. Let input be the attribute's value.
2. Let position be a pointer into input, initially pointing at the start of the string.
3. [Skip whitespace](http://www.w3.org/TR/html5/common-microsyntaxes.html#skip-whitespace).
4. If position is past the end of input, there is no [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints). Abort these steps.
5. If the character at position is a U+002B PLUS SIGN character (+), then let mode be *relative-plus*, and advance position to the next character. Otherwise, if the character at position is a U+002D HYPHEN-MINUS character (-), then let mode be *relative-minus*, and advance position to the next character. Otherwise, let mode be *absolute*.
6. [Collect a sequence of characters](http://www.w3.org/TR/html5/common-microsyntaxes.html#collect-a-sequence-of-characters) in the range U+0030 DIGIT ZERO (0) to U+0039 DIGIT NINE (9), and let the resulting sequence be digits.
7. If digits is the empty string, there is no [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints). Abort these steps.
8. Interpret digits as a base-ten integer. Let value be the resulting number.
9. If mode is *relative-plus*, then increment value by 3. If mode is *relative-minus*, then let value be the result of subtracting value from 3.
10. If value is greater than 7, let it be 7.
11. If value is less than 1, let it be 1.
12. Set 'font-size' to the keyword corresponding to the value of value according to the following table:

| **value** | **'font-size' keyword** | **Notes** |
| --- | --- | --- |
| 1 | xx-small |  |
| 2 | small |  |
| 3 | medium |  |
| 4 | large |  |
| 5 | x-large |  |
| 6 | xx-large |  |
| 7 | xxx-large | *see below* |

1. The 'xxx-large' value is a non-CSS value used here to indicate a font size one "step" larger than 'xx-large'.

#### 10.2.6 Punctuation and decorations

@namespace url(http://www.w3.org/1999/xhtml);

:link, :visited, ins, u { text-decoration: underline; }

abbr[title], acronym[title] { text-decoration: dotted underline; }

del, s, strike { text-decoration: line-through; }

blink { text-decoration: blink; }

:focus { outline: auto; }

q:before { content: open-quote; }

q:after { content: close-quote; }

br { content: '\A'; white-space: pre; }

nobr { white-space: nowrap; }

listing, plaintext, pre, xmp { white-space: pre; }

textarea { white-space: pre-wrap; }

ol { list-style-type: decimal; }

dir, menu, ul {

list-style-type: disc;

}

dir dl, dir menu, dir ul,

menu dl, menu menu, menu ul,

ol dl, ol menu, ol ul,

ul dl, ul menu, ul ul {

list-style-type: circle;

}

dir dir dl, dir dir menu, dir dir ul,

dir menu dl, dir menu menu, dir menu ul,

dir ol dl, dir ol menu, dir ol ul,

dir ul dl, dir ul menu, dir ul ul,

menu dir dl, menu dir menu, menu dir ul,

menu menu dl, menu menu menu, menu menu ul,

menu ol dl, menu ol menu, menu ol ul,

menu ul dl, menu ul menu, menu ul ul,

ol dir dl, ol dir menu, ol dir ul,

ol menu dl, ol menu menu, ol menu ul,

ol ol dl, ol ol menu, ol ol ul,

ol ul dl, ol ul menu, ol ul ul,

ul dir dl, ul dir menu, ul dir ul,

ul menu dl, ul menu menu, ul menu ul,

ul ol dl, ul ol menu, ul ol ul,

ul ul dl, ul ul menu, ul ul ul {

list-style-type: square;

}

table { border-style: outset; }

td, th { border-style: inset; }

:ltr { direction: ltr; }

:rtl { direction: rtl; }

[dir] { unicode-bidi: embed; }

bdi, output, [dir=auto] { unicode-bidi: isolate; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

bdo, bdo[dir] { unicode-bidi: bidi-override; }

bdo[dir=auto] { unicode-bidi: bidi-override isolate; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

textarea[dir=auto], pre[dir=auto] { unicode-bidi: plaintext; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

Rules setting the 'quotes' property appropriately for the locales and languages understood by the user are expected to be present.

User agents are expected to support the 'clear' property on inline elements (in order to render [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) elements with [clear](http://www.w3.org/TR/html5/obsolete.html#attr-br-clear) attributes) in the manner described in the non-normative note to this effect in CSS2.1.

The following rules are also expected to apply, as [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints):

@namespace url(http://www.w3.org/1999/xhtml);

td[nowrap], th[nowrap] { white-space: nowrap; }

pre[wrap] { white-space: pre-wrap; }

br[clear=left] { clear: left; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

br[clear=right] { clear: right; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

br[clear=all], br[clear=both] { clear: both; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

ol[type=1], li[type=1] { list-style-type: decimal; }

ol[type=a], li[type=a] { list-style-type: lower-alpha; }

ol[type=A], li[type=A] { list-style-type: upper-alpha; }

ol[type=i], li[type=i] { list-style-type: lower-roman; }

ol[type=I], li[type=I] { list-style-type: upper-roman; }

ul[type=disc], li[type=disc] { list-style-type: disc; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

ul[type=circle], li[type=circle] { list-style-type: circle; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

ul[type=square], li[type=square] { list-style-type: square; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

table[rules=none], table[rules=groups], table[rules=rows],

table[rules=cols], table[rules=all] {

border-style: none;

border-collapse: collapse;

}

table[frame=void] { border-style: hidden hidden hidden hidden; }

table[frame=above] { border-style: solid hidden hidden hidden; }

table[frame=below] { border-style: hidden hidden solid hidden; }

table[frame=hsides] { border-style: solid hidden solid hidden; }

table[frame=lhs] { border-style: hidden hidden hidden solid; }

table[frame=rhs] { border-style: hidden solid hidden hidden; }

table[frame=vsides] { border-style: hidden solid hidden solid; }

table[frame=box],

table[frame=border] { border-style: solid solid solid solid; }

table[rules=none] > tr > td, table[rules=none] > tr > th,

table[rules=none] > thead > tr > td, table[rules=none] > thead > tr > th,

table[rules=none] > tbody > tr > td, table[rules=none] > tbody > tr > th,

table[rules=none] > tfoot > tr > td, table[rules=none] > tfoot > tr > th,

table[rules=groups] > tr > td, table[rules=groups] > tr > th,

table[rules=groups] > thead > tr > td, table[rules=groups] > thead > tr > th,

table[rules=groups] > tbody > tr > td, table[rules=groups] > tbody > tr > th,

table[rules=groups] > tfoot > tr > td, table[rules=groups] > tfoot > tr > th,

table[rules=rows] > tr > td, table[rules=rows] > tr > th,

table[rules=rows] > thead > tr > td, table[rules=rows] > thead > tr > th,

table[rules=rows] > tbody > tr > td, table[rules=rows] > tbody > tr > th,

table[rules=rows] > tfoot > tr > td, table[rules=rows] > tfoot > tr > th {

border-style: none;

}

table[rules=groups] > colgroup, table[rules=groups] > thead,

table[rules=groups] > tbody, table[rules=groups] > tfoot {

border-style: solid;

}

table[rules=rows] > tr, table[rules=rows] > thead > tr,

table[rules=rows] > tbody > tr, table[rules=rows] > tfoot > tr {

border-style: solid;

}

table[rules=cols] > tr > td, table[rules=cols] > tr > th,

table[rules=cols] > thead > tr > td, table[rules=cols] > thead > tr > th,

table[rules=cols] > tbody > tr > td, table[rules=cols] > tbody > tr > th,

table[rules=cols] > tfoot > tr > td, table[rules=cols] > tfoot > tr > th {

border-style: none solid none solid;

}

table[rules=all] > tr > td, table[rules=all] > tr > th,

table[rules=all] > thead > tr > td, table[rules=all] > thead > tr > th,

table[rules=all] > tbody > tr > td, table[rules=all] > tbody > tr > th,

table[rules=all] > tfoot > tr > td, table[rules=all] > tfoot > tr > th {

border-style: solid;

}

table[border] > tr > td, table[border] > tr > th,

table[border] > thead > tr > td, table[border] > thead > tr > th,

table[border] > tbody > tr > td, table[border] > tbody > tr > th,

table[border] > tfoot > tr > td, table[border] > tfoot > tr > th {

border-width: 1px;

}

When rendering [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) elements, user agents are expected to use the [ordinal value](http://www.w3.org/TR/html5/grouping-content.html#ordinal-value) of the [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element to render the counter in the list item marker.

The [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element's [border](http://www.w3.org/TR/html5/tabular-data.html#attr-table-border) attribute [maps to the pixel length properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-pixel-length-property) 'border-top-width', 'border-right-width', 'border-bottom-width', 'border-left-width' on the element. If the attribute is present but parsing the attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) generates an error, a default value of 1px is expected to be used for that property instead.

The [wbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element) element is expected to override the 'white-space' property and always provide a line-breaking opportunity.

#### 10.2.7 Resetting rules for inherited properties

The following rules are also expected to be in play, resetting certain properties to block inheritance by default.

@namespace url(http://www.w3.org/1999/xhtml);

table, input, select, option, optgroup, button, textarea, keygen {

text-indent: initial;

}

In [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode), the following rules are also expected to apply:

@namespace url(http://www.w3.org/1999/xhtml);

table {

font-weight: initial;

font-style: initial;

font-variant: initial;

font-size: initial;

line-height: initial;

white-space: initial;

text-align: initial;

}

input { box-sizing: border-box; }

#### 10.2.8 The [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element

@namespace url(http://www.w3.org/1999/xhtml);

hr { color: gray; border-style: inset; border-width: 1px; margin: 0.5em auto; }

The following rules are also expected to apply, as [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints):

@namespace url(http://www.w3.org/1999/xhtml);

hr[align=left] { margin-left: 0; margin-right: auto; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

hr[align=right] { margin-left: auto; margin-right: 0; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

hr[align=center] { margin-left: auto; margin-right: auto; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

hr[color], hr[noshade] { border-style: solid; }

If an [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element has either a [color](http://www.w3.org/TR/html5/obsolete.html#attr-hr-color) attribute or a [noshade](http://www.w3.org/TR/html5/obsolete.html#attr-hr-noshade) attribute, and furthermore also has a [size](http://www.w3.org/TR/html5/obsolete.html#attr-hr-size) attribute, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then the user agent is expected to use the parsed value divided by two as a pixel length for [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the properties 'border-top-width', 'border-right-width', 'border-bottom-width', and 'border-left-width' on the element.

Otherwise, if an [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element has neither a [color](http://www.w3.org/TR/html5/obsolete.html#attr-hr-color) attribute nor a [noshade](http://www.w3.org/TR/html5/obsolete.html#attr-hr-noshade) attribute, but does have a [size](http://www.w3.org/TR/html5/obsolete.html#attr-hr-size) attribute, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then: if the parsed value is one, then the user agent is expected to use the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'border-bottom-width' to 0; otherwise, if the parsed value is greater than one, then the user agent is expected to use the parsed value minus two as a pixel length for [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the 'height' property on the element.

The [width](http://www.w3.org/TR/html5/obsolete.html#attr-hr-width) attribute on an [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element [maps to the dimension property](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' on the element.

When an [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element has a [color](http://www.w3.org/TR/html5/obsolete.html#attr-hr-color) attribute, its value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'color' property to the resulting color.

#### 10.2.9 The [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element

@namespace url(http://www.w3.org/1999/xhtml);

fieldset {

margin-left: 2px; margin-right: 2px;

border: groove 2px ThreeDFace;

padding: 0.35em 0.625em 0.75em;

}

The [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element is expected to establish a new block formatting context.

If the [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element has a child that matches the conditions in the list below, then the first such child is the [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element's rendered legend:

* The child is a [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) element.
* The child is not out-of-flow (e.g. not absolutely positioned or floated).
* The child is generating a box (e.g. it is not 'display:none').

A [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element's [rendered legend](http://www.w3.org/TR/html5/rendering.html#rendered-legend), if any, is expected to be rendered over the top border edge of the [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) element as a 'block' box (overriding any explicit 'display' value). In the absence of an explicit width, the box should shrink-wrap. If the [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) element in question has an [align](http://www.w3.org/TR/html5/obsolete.html#attr-legend-align) attribute, and its value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for one of the strings in the first column of the following table, then the [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) is expected to be rendered horizontally aligned over the border edge in the position given in the corresponding cell on the same row in the second column. If the attribute is absent or has a value that doesn't match any of the cases in the table, then the position is expected to be on the right if the 'direction' property on this element has a computed value of 'rtl', and on the left otherwise.

| **Attribute value** | **Alignment position** |
| --- | --- |
| left | On the left |
| right | On the right |
| center | In the middle |

### 10.3 Replaced elements

#### 10.3.1 Embedded content

The [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), and [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) elements are expected to be treated as replaced elements.

A [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) element that [represents](http://www.w3.org/TR/html5/rendering.html#represents) [embedded content](http://www.w3.org/TR/html5/content-models.html#embedded-content) is expected to be treated as a replaced element. Other [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) elements are expected to be treated as ordinary elements in the rendering model.

An [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element that [represents](http://www.w3.org/TR/html5/rendering.html#represents) an image, plugin, or [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) is expected to be treated as a replaced element. Other [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements are expected to be treated as ordinary elements in the rendering model.

An [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element that [represents](http://www.w3.org/TR/html5/rendering.html#represents) a [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) is expected to be treated as a replaced element. Other [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) elements are expected to be treated as ordinary elements in the rendering model.

The [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) element, when it is [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user), is expected to be treated as a replaced element about one line high, as wide as is necessary to expose the user agent's user interface features. When an [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) element is not [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user), the user agent is expected to hide it, irrespective of CSS rules.

Whether a [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element is [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user) is not expected to affect the size of the rendering; controls are expected to be overlaid with the page content without causing any layout changes, and are expected to disappear when the user does not need them.

When a [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element represents a poster frame or frame of video, the poster frame or frame of video is expected to be rendered at the largest size that maintains the aspect ratio of that poster frame or frame of video without being taller or wider than the [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element itself, and is expected to be centered in the [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element.

Any subtitles or captions are expected to be overlayed directly on top of their [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element, as defined by the relevant rendering rules; for WebVTT, those are the [WebVTT cue text rendering rules](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-text-rendering-rules) defined below.

When the user agent starts [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user) for a [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element, the user agent should run the [rules for updating the text track rendering](http://www.w3.org/TR/html5/the-iframe-element.html#rules-for-updating-the-text-track-rendering) of each of the [text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) in the [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element's [list of text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#list-of-text-tracks) that are [showing](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-showing) or [showing by default](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-showing-by-default) (e.g., for [text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) based on WebVTT, the [rules for updating the display of WebVTT text tracks](http://www.w3.org/TR/html5/rendering.html#rules-for-updating-the-display-of-webvtt-text-tracks)).

Resizing [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) and [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) elements does not interrupt video playback or clear the canvas.

The following CSS rules are expected to apply:

@namespace url(http://www.w3.org/1999/xhtml);

iframe:not([seamless]) { border: 2px inset; }

video { object-fit: contain; }

#### 10.3.2 Timed text tracks

This section is intended to be moved to its own CSS module once an editor is found to run with it.

##### 10.3.2.1 WebVTT cue text rendering rules

The rules for updating the display of WebVTT text tracks render the [text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) of a [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) (specifically, a [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element), or of another playback mechanism, by applying the steps below. All the [text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) that use these rules for a given [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element), or other playback mechanism, are rendered together, to avoid overlapping subtitles from multiple tracks.

The output of the steps below is a set of CSS boxes that covers the rendering area of the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) or other playback mechanism, which user agents are expected to render in a manner suiting the user.

The rules are as follows:

1. If the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) is an [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) element, or is another playback mechanism with no rendering area, abort these steps. There is nothing to render.
2. Let video be the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) or other playback mechanism.
3. Let output be an empty list of absolutely positioned CSS block boxes.
4. If the user agent is [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user) for video, add to output one or more completely transparent positioned CSS block boxes that cover the same region as the user interface.
5. If the last time these rules were run, the user agent was not [exposing a user interface](http://www.w3.org/TR/html5/the-iframe-element.html#expose-a-user-interface-to-the-user) for video, but now it is, let reset be true. Otherwise, let reset be false.
6. Let tracks be the subset of video's [list of text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#list-of-text-tracks) that have as their [rules for updating the text track rendering](http://www.w3.org/TR/html5/the-iframe-element.html#rules-for-updating-the-text-track-rendering) these [rules for updating the display of WebVTT text tracks](http://www.w3.org/TR/html5/rendering.html#rules-for-updating-the-display-of-webvtt-text-tracks), and whose [text track mode](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-mode) is [showing](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-showing) or [showing by default](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-showing-by-default).
7. Let cues be an empty list of [text track cues](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue).
8. For each track track in tracks, append to cues all the [cues](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) from track's [list of cues](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-list-of-cues) that have their [text track cue active flag](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-active-flag) set.
9. If reset is false, then, for each [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) cue in cues: if cue's [text track cue display state](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-display-state) has a set of CSS boxes, then add those boxes to output, and remove cue from cues.
10. For each [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) cue in cues that has not yet had corresponding CSS boxes added to output, in [text track cue order](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-order), run the following substeps:
    1. Let nodes be the list of WebVTT Node Objects obtained by applying the WebVTT cue text parsing rules to the cue's [text track cue text](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-text).
    2. Apply the Unicode Bidirectional Algorithm's Paragraph Level steps to nodes using the following constraints, to determine the *paragraph embedding level* of the cue: [[BIDI]](http://www.w3.org/TR/html5/references.html#refsBIDI)
       * nodes represents a single paragraph.
       * The paragraph's text consists of the concatenation of the values of each WebVTT Text Object in nodes, in a pre-order, depth-first traversal, excluding WebVTT Ruby Text Objects and their descendants.
    3. If the *paragraph embedding level* determined in the previous step is even (the *paragraph direction* is left-to-right), let direction be 'ltr', otherwise, let it be 'rtl'.
    4. If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), then let block-flow be 'tb'. Otherwise, if the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), then let block-flow be 'lr'. Otherwise, the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction); let block-flow be 'rl'.
    5. Determine the value of maximum size for cue as per the appropriate rules from the following list:

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is start, and direction is 'ltr'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is end, and direction is 'rtl'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue alignment is start

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue alignment is start

Let maximum size be the text track cue text position subtracted from 100.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is end, and direction is 'ltr'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is start, and direction is 'rtl'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue alignment is end

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue alignment is end

Let maximum size be the text track cue text position.

If the text track cue alignment is middle, the text track cue text position is less than or equal to 50

Let maximum size be the text track cue text position multiplied by two.

If the text track cue alignment is middle, the text track cue text position is greater than 50

Let maximum size be the result of subtracting text track cue text position from 100 and then multiplying the result by two.

* 1. If the [text track cue size](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-size) is less than maximum size, then let size be [text track cue size](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-size). Otherwise, let size be maximum size.
  2. If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), then let width be 'size vw' and height be 'auto'. Otherwise, let width be 'auto' and height be 'size vh'. (These are CSS values used by the next section to set CSS properties for the rendering; 'vw' and 'vh' are CSS units.) [[CSSVALUES]](http://www.w3.org/TR/html5/references.html#refsCSSVALUES)
  3. Determine the value of x-position or y-position for cue as per the appropriate rules from the following list:

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is start, and direction is 'ltr'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is end, and direction is 'rtl'

Let x-position be the text track cue text position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is end, and direction is 'ltr'

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is start, and direction is 'rtl'

Let x-position be the text track cue text position subtracted from 100.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue alignment is start

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue alignment is start

Let y-position be the text track cue text position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue alignment is end

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue alignment is end

Let y-position be the text track cue text position subtracted from 100.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is middle, and direction is 'ltr'

Let x-position be the text track cue text position minus half of size.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), the text track cue alignment is middle, and direction is 'rtl'

Let x-position-reverse be the text track cue text position minus half of size.

Let x-position be x-position-reverse subtracted from 100.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue alignment is middle

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue alignment is middle

Let y-position be the text track cue text position minus half of size.

* 1. Determine the value of whichever of x-position or y-position is not yet calculated for cue as per the appropriate rules from the following list:

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), and the text track cue snap-to-lines flag is set

Let y-position be zero.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), and the text track cue snap-to-lines flag is not set

Let y-position be the text track cue line position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue snap-to-lines flag is set

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue snap-to-lines flag is set

Let x-position be zero.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and the text track cue snap-to-lines flag is not set

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), and the text track cue snap-to-lines flag is not set

Let x-position be the text track cue line position.

* 1. Let left be 'x-position vw' and top be 'y-position vh'. (These again are CSS values used by the next section to set CSS properties for the rendering; 'vw' and 'vh' are CSS units.) [[CSSVALUES]](http://www.w3.org/TR/html5/references.html#refsCSSVALUES)
  2. Apply the terms of the CSS specifications to nodes within the following constraints, thus obtaining a set of CSS boxes positioned relative to an initial containing block: [[CSS]](http://www.w3.org/TR/html5/references.html#refsCSS)
     + The *document tree* is the tree of WebVTT Node Objects rooted at nodes.
     + For the purposes of processing by the CSS specification, WebVTT Internal Node Objects are equivalent to elements with the same contents.
     + For the purposes of processing by the CSS specification, WebVTT Text Objects are equivalent to text nodes.
     + No style sheets are associated with nodes. (The nodes are subsequently restyled using style sheets after their boxes are generated, as described below.)
     + The children of the nodes must be wrapped in an anonymous box whose 'display' property has the value 'inline'. This is the WebVTT cue background box.
     + Runs of children of WebVTT Ruby Objects that are not WebVTT Ruby Text Objects must be wrapped in anonymous boxes whose 'display' property has the value 'ruby-base'. [[CSSRUBY]](http://www.w3.org/TR/html5/references.html#refsCSSRUBY)
     + Properties on WebVTT Node Objects have their values set as defined in the next section. (That section uses some of the variables whose values were calculated earlier in this algorithm.)
     + Text runs must be wrapped at the edge of their containing blocks, regardless of the value of the 'white-space' property, even if doing so requires splitting a word where there is no line breaking opportunity.
     + The viewport (and initial containing block) is video's rendering area.

Let boxes be the boxes generated as descendants of the initial containing block, along with their positions.

* 1. If there are no line boxes in boxes, skip the remainder of these substeps for cue. The cue is ignored.
  2. Adjust the positions of boxes according to the appropriate steps from the following list:

If cue's text track cue snap-to-lines flag is set

Many of the steps in this algorithm vary according to the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction). Steps labeled "**Horizontal**" must be followed only when the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), steps labeled "**Vertical**" must be followed when the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is either [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction) or [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction), steps labeled "**Vertical Growing Left**" must be followed only when the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction), and steps labeled "**Vertical Growing Right**" must be followed only when the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction).

* + - **Horizontal**: Let step be the height of the first line box in boxes.

**Vertical**: Let step be the width of the first line box in boxes.

* + - If step is zero, then jump to the step labeled *done positioning* below.
    - Let line position be the text track cue line position.
    - **Vertical Growing Left**: Add one to line position then negate it.
    - Let position be the result of multiplying step and line position.
    - **Vertical Growing Left**: Decrease position by the width of the bounding box of the boxes in boxes, then increase position by step.
    - **Horizontal**: If line position is less than zero then increase position by the height of the video's rendering area, and negate step (so its value is now minus the height of the first line box in boxes).

**Vertical**: If line position is less than zero then increase position by the width of the video's rendering area, and negate step.

* + - **Horizontal**: Move all the boxes in boxes down by the distance given by position.

**Vertical**: Move all the boxes in boxes right by the distance given by position.

* + - *Default*: Remember the position of all the boxes in boxes as their default position.
    - Let switched be false.
    - *Step loop*: If none of the boxes in boxes would overlap any of the boxes in output, and all the boxes in output are within the video's rendering area, then jump to the step labeled *done positioning* below.
    - **Horizontal**: If step is negative and the top of the first line box in boxes is now above the top of the video's rendering area, or if step is positive and the bottom of the first line box in boxes is now below the bottom of the video's rendering area, jump to the step labeled *switch direction*.

**Vertical**: If step is negative and the left edge of the first line box in boxes is now to the left of the left edge of the video's rendering area, or if step is positive and the right edge of the first line box in boxes is now to the right of the right edge of the video's rendering area, jump to the step labeled *switch direction*.

* + - **Horizontal**: Move all the boxes in boxes down by the distance given by step. (If step is negative, then this will actually result in an upwards movement of the boxes in absolute terms.)

**Vertical**: Move all the boxes in boxes right by the distance given by step. (If step is negative, then this will actually result in a leftwards movement of the boxes in absolute terms.)

* + - Jump back to the step labeled *step loop*.
    - *Switch direction*: Move all the boxes in boxes back to their default position as determined in the step above labeled *default*.
    - If switched is true, jump to the step labeled *done positioning* below.
    - Negate step.
    - Set switched to true.
    - Jump back to the step labeled *step loop*.

If cue's text track cue snap-to-lines flag is not set

* + - Set up x and y as follows:

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), and direction is 'ltr'

Let x be a percentage given by the text track cue text position, and let y be a percentage given by the text track cue line position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [horizontal](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-horizontal-writing-direction), and direction is 'rtl'

Let x be a percentage given by the text track cue text position subtracted from 100, and let y be a percentage given by the text track cue line position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing left](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-left-writing-direction)

Let x be a percentage given by the text track cue line position subtracted from 100, and let y be a percentage given by the text track cue text position.

If the [text track cue writing direction](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-writing-direction) is [vertical growing right](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-vertical-growing-right-writing-direction)

Let x be a percentage given by the text track cue line position, and let y be a percentage given by the text track cue text position.

* + - Position the boxes in boxes such that the point x% along the width of the bounding box of the boxes in boxes is x% of the way across the width of the video's rendering area, and the point y% along the height of the bounding box of the boxes in boxes is y% of the way across the height of the video's rendering area, while maintaining the relative positions of the boxes in boxes to each other.
    - If none of the boxes in boxes would overlap any of the boxes in output, and all the boxes in output are within the video's rendering area, then jump to the step labeled *done positioning* below.
    - If there is a position to which the boxes in boxes can be moved while maintaining the relative positions of the boxes in boxes to each other such that none of the boxes in boxes would overlap any of the boxes in output, and all the boxes in output would be within the video's rendering area, then move the boxes in boxes to the closest such position to their current position, and then jump to the step labeled *done positioning* below. If there are multiple such positions that are equidistant from their current position, use the highest one amongst them; if there are several at that height, then use the leftmost one amongst them.
    - Otherwise, jump to the step labeled *done positioning* below. (The boxes will unfortunately overlap.)
  1. *Done positioning*: If there are any line boxes in the (possibly now repositioned) boxes that do not completely fit inside video's rendering area, remove those offending line boxes from boxes.
  2. Let cue's [text track cue display state](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-display-state) have the CSS boxes in boxes.
  3. Add the CSS boxes in boxes to output.

1. Return output.

##### 10.3.2.2 Applying CSS properties to WebVTT Node Objects

When following the [rules for updating the display of WebVTT text tracks](http://www.w3.org/TR/html5/rendering.html#rules-for-updating-the-display-of-webvtt-text-tracks), user agents must set properties of WebVTT Node Objects as defined in this section. [[CSS]](http://www.w3.org/TR/html5/references.html#refsCSS)

On the (root) List of WebVTT Node Objects, the 'position' property must be set to 'absolute', the 'direction' property must be set to direction, the 'block-flow' property must be set to block-flow, the 'top' property must be set to top, the 'left' property must be set to left, the 'width' property must be set to width, and the 'height' property must be set to height, where direction, block-flow, top, left, width, and height are the values with those names determined by the [rules for updating the display of WebVTT text tracks](http://www.w3.org/TR/html5/rendering.html#rules-for-updating-the-display-of-webvtt-text-tracks) for the [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) from whose [text](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue-text) the List of WebVTT Node Objects was constructed.

The 'font' shorthand property on the (root) List of WebVTT Node Objects must be set to '0.1vh sans-serif'. [[CSSRUBY]](http://www.w3.org/TR/html5/references.html#refsCSSRUBY) [[CSSVALUES]](http://www.w3.org/TR/html5/references.html#refsCSSVALUES)

The 'color' property on the (root) List of WebVTT Node Objects must be set to 'rgba(255,255,255,0)'. [[CSSCOLOR]](http://www.w3.org/TR/html5/references.html#refsCSSCOLOR)

The 'background' shorthand property on the [WebVTT cue background box](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-background-box) must be set to 'rgba(0,0,0,0.8)'. [[CSSCOLOR]](http://www.w3.org/TR/html5/references.html#refsCSSCOLOR)

A text outline or stroke may also be set on the (root) List of WebVTT Node Objects, if supported.

The 'font-style' property on WebVTT Italic Objects must be set to 'italic'.

The 'font-weight' property on WebVTT Bold Objects must be set to 'bold'.

The 'text-decoration' property on WebVTT Underline Objects must be set to 'underline'.

The 'display' property on WebVTT Ruby Objects must be set to 'ruby'. [[CSSRUBY]](http://www.w3.org/TR/html5/references.html#refsCSSRUBY)

The 'display' property on WebVTT Ruby Text Objects must be set to 'ruby-text'. [[CSSRUBY]](http://www.w3.org/TR/html5/references.html#refsCSSRUBY)

If there are style sheets that apply to the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) or other playback mechanism, then they must be interpreted as defined in the next section.

All other non-inherited properties must be set to their initial values; inherited properties on the root List of WebVTT Node Objects must inherit their values from the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) for which the [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) is being rendered, if any. If there is no [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) (i.e. if the [text track](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) is being rendered for another media playback mechanism), then inherited properties on the root List of WebVTT Node Objects must take their initial values.

##### 10.3.2.3 CSS extensions

When a user agent is rendering one or more [text track cues](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) according to the [WebVTT cue text rendering rules](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-text-rendering-rules), WebVTT Node Objects in the list of WebVTT Node Objects used in the rendering can be matched by certain pseudo-selectors as defined below. These selectors can begin or stop matching individual WebVTT Node Objects while a [cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) is being rendered, even in between applications of the [WebVTT cue text rendering rules](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-text-rendering-rules) (which are only run when the set of active cues changes). User agents that support the pseudo-element described below must dynamically update renderings accordingly.

Pseudo-elements apply to elements that are matched by selectors. For the purpose of this section, that element is the *matched element*. The pseudo-elements defined in the following sections affect the styling of parts of [text track cues](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue) that are being rendered for the *matched element*.

If the *matched element* is not a [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) element, the pseudo-elements defined below won't have any effect according to this specification.

A CSS user agent that implements the [text tracks](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) model must implement the '::cue' and '::cue(selector)' pseudo-elements, and the ':past' and ':future' pseudo-classes.

###### 10.3.2.3.1 The '::cue' pseudo-element

The '::cue' pseudo-element (with no argument) matches any List of WebVTT Node Objects constructed for the *matched element*, with the exception that the properties corresponding to the 'background' shorthand must be applied to the [WebVTT cue background box](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-background-box) rather than the List of WebVTT Node Objects.

The following properties apply to the '::cue' pseudo-element with no argument; other properties set on the pseudo-element must be ignored:

* 'color'
* 'text-shadow'
* 'text-outline'
* the properties corresponding to the 'background' shorthand
* the properties corresponding to the 'outline' shorthand
* the properties corresponding to the 'font' shorthand, including 'line-height'

The '::cue(selector)' pseudo-element with an argument must have an argument that consists of a group of selectors. It matches any WebVTT Internal Node Object constructed for the *matched element* that also matches the given group of selectors, with the nodes being treated as follows:

* The *document tree* against which the selectors are matched is the tree of WebVTT Node Objects rooted at the list of WebVTT Node Objects for the cue.
* WebVTT Internal Node Objects are elements in the tree.
* WebVTT Leaf Node Objects cannot be matched.
* For the purposes of element type selectors, the names of WebVTT Internal Node Objects are as given by the following table, where objects having the concrete class given in a cell in the first column have the name given by the second column of the same row:

| **Concrete class** | **Name** |
| --- | --- |
| WebVTT Class Objects | c |
| WebVTT Italic Objects | i |
| WebVTT Bold Objects | b |
| WebVTT Underline Objects | u |
| WebVTT Ruby Objects | ruby |
| WebVTT Ruby Text Objects | rt |
| WebVTT Voice Objects | v |
| Other elements (specifically, Lists of WebVTT Node Objects) | No explicit name. |

* For the purposes of element type and universal selectors, WebVTT Internal Node Objects are considered as being in the namespace expressed as the empty string.
* For the purposes of attribute selector matching, WebVTT Internal Node Objects have no attributes, except for WebVTT Voice Objects, which have a single attribute named "voice" whose value is the value of the WebVTT Voice Object.
* For the purposes of class selector matching, WebVTT Internal Node Objects have the classes described as the WebVTT Node Object's applicable classes.

The following properties apply to the '::cue()' pseudo-element with an argument:

* 'color'
* 'text-shadow'
* 'text-outline'
* the properties corresponding to the 'background' shorthand
* the properties corresponding to the 'outline' shorthand
* properties relating to the transition and animation features

The following properties apply to the '::cue()' pseudo-element with an argument when the selector does not contain the ':past' and ':future' pseudo-classes:

* the properties corresponding to the 'font' shorthand, including 'line-height'

Properties that do not apply must be ignored.

As a special exception, the properties corresponding to the 'background' shorthand, when they would have been applied to the List of WebVTT Node Objects, must instead be applied to the [WebVTT cue background box](http://www.w3.org/TR/html5/rendering.html#webvtt-cue-background-box).

###### 10.3.2.3.2 The ':past' and ':future' pseudo-classes

The ':past' and ':future' pseudo-classes only match WebVTT Node Objects.

The ':past' pseudo-class only matches WebVTT Node Objects that are [*in the past*](http://www.w3.org/TR/html5/rendering.html#in-the-past).

A WebVTT Node Object c is in the past if, in a pre-order, depth-first traversal of the [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue)'s List of WebVTT Node Objects, there exists a WebVTT Timestamp Object whose value is less than the [current playback position](http://www.w3.org/TR/html5/the-iframe-element.html#current-playback-position) of the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) that is the *matched element*, entirely after the WebVTT Node Object c.

The ':future' pseudo-class only matches WebVTT Node Objects that are [*in the future*](http://www.w3.org/TR/html5/rendering.html#in-the-future).

A WebVTT Node Object c is in the future if, in a pre-order, depth-first traversal of the [text track cue](http://www.w3.org/TR/html5/the-iframe-element.html#text-track-cue)'s List of WebVTT Node Objects, there exists a WebVTT Timestamp Object whose value is greater than the [current playback position](http://www.w3.org/TR/html5/the-iframe-element.html#current-playback-position) of the [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) that is the *matched element*, entirely before the WebVTT Node Object c.

#### 10.3.3 Images

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element or an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element when its [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state [represents](http://www.w3.org/TR/html5/rendering.html#represents) an image, it is expected to be treated as a replaced element.

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element or an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element when its [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state does not [represent](http://www.w3.org/TR/html5/rendering.html#represents) an image, but the element already has intrinsic dimensions (e.g. from the [dimension attributes](http://www.w3.org/TR/html5/the-map-element.html#dimension-attributes) or CSS rules), and either the user agent has reason to believe that the image will become *available* and be rendered in due course or the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is in [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode), the element is expected to be treated as a replaced element whose content is the text that the element represents, if any, optionally alongside an icon indicating that the image is being obtained. For [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements, the text is expected to appear button-like to indicate that the element is a [button](http://www.w3.org/TR/html5/forms.html#concept-button).

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) some text and the user agent does not expect this to change, the element is expected to be treated as an inline element whose content is the text, optionally with an icon indicating that an image is missing.

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) nothing and the user agent does not expect this to change, the element is expected to not be rendered at all.

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element might be a key part of the content, but neither the image nor any kind of alternative text is available, and the user agent does not expect this to change, the element is expected to be treated as an inline element whose content is an icon indicating that an image is missing.

When an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state does not [represent](http://www.w3.org/TR/html5/rendering.html#represents) an image and the user agent does not expect this to change, the element is expected to be treated as a replaced element consisting of a button whose content is the element's alternative text. The intrinsic dimensions of the button are expected to be about one line in height and whatever width is necessary to render the text on one line.

The icons mentioned above are expected to be relatively small so as not to disrupt most text but be easily clickable. In a visual environment, for instance, icons could be 16 pixels by 16 pixels square, or 1em by 1em if the images are scalable. In an audio environment, the icon could be a short bleep. The icons are intended to indicate to the user that they can be used to get to whatever options the UA provides for images, and, where appropriate, are expected to provide access to the context menu that would have come up if the user interacted with the actual image.

All animated images with the same [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) and the same image data are expected to be rendered synchronized to the same timeline as a group, with the timeline starting at the time of the most recent addition to the group.

In other words, the animation loop of an animated image is restarted each time another image with the same [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url) and image data begins to animate, e.g. after being inserted into the document.

The following CSS rules are expected to apply when the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) is in [quirks mode](http://www.w3.org/TR/html5/dom.html#quirks-mode):

@namespace url(http://www.w3.org/1999/xhtml);

img[align=left] { margin-right: 3px; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

img[align=right] { margin-left: 3px; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

#### 10.3.4 Attributes for embedded content and images

The following CSS rules are expected to apply as [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints):

@namespace url(http://www.w3.org/1999/xhtml);

iframe[frameborder=0], iframe[frameborder=no] { border: none; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

applet[align=left], embed[align=left], iframe[align=left],

img[align=left], input[type=image][align=left], object[align=left] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

float: left;

}

applet[align=right], embed[align=right], iframe[align=right],

img[align=right], input[type=image][align=right], object[align=right] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

float: right;

}

applet[align=top], embed[align=top], iframe[align=top],

img[align=top], input[type=image][align=top], object[align=top] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: top;

}

applet[align=baseline], embed[align=baseline], iframe[align=baseline],

img[align=baseline], input[type=image][align=baseline], object[align=baseline] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: baseline;

}

applet[align=texttop], embed[align=texttop], iframe[align=texttop],

img[align=texttop], input[type=image][align=texttop], object[align=texttop] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: text-top;

}

applet[align=absmiddle], embed[align=absmiddle], iframe[align=absmiddle],

img[align=absmiddle], input[type=image][align=absmiddle], object[align=absmiddle],

applet[align=abscenter], embed[align=abscenter], iframe[align=abscenter],

img[align=abscenter], input[type=image][align=abscenter], object[align=abscenter] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: middle;

}

applet[align=bottom], embed[align=bottom], iframe[align=bottom],

img[align=bottom], input[type=image][align=bottom],

object[align=bottom] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

vertical-align: bottom;

}

When an [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element, or an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state, has an align attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "center" or the string "middle", the user agent is expected to act as if the element's 'vertical-align' property was set to a value that aligns the vertical middle of the element with the parent element's baseline.

The hspace attribute of [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements, and [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements with a [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state, [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-left' and 'margin-right' on the element.

The vspace attribute of [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements, and [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements with a [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state, [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-top' and 'margin-bottom' on the element.

When an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element, [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element, or [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element with a [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state is contained within a [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) and has a border attribute whose value, when parsed using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers), is found to be a number greater than zero, the user agent is expected to use the parsed value for eight [presentational hints](http://www.w3.org/TR/html5/rendering.html#presentational-hints): four setting the parsed value as a pixel length for the element's 'border-top-width', 'border-right-width', 'border-bottom-width', and 'border-left-width' properties, and four setting the element's 'border-top-style', 'border-right-style', 'border-bottom-style', and 'border-left-style' properties to the value 'solid'.

The [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width) and [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) attributes on [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) or [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) elements, and [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements with a [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute in the [Image Button](http://www.w3.org/TR/html5/number-state.html#image-button-state) state, [map to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' and 'height' on the element respectively.

#### 10.3.5 Image maps

Shapes on an [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) are expected to act, for the purpose of the CSS cascade, as elements independent of the original [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element that happen to match the same style rules but inherit from the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element.

For the purposes of the rendering, only the 'cursor' property is expected to have any effect on the shape.

Thus, for example, if an [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element has a [style](http://www.w3.org/TR/html5/elements.html#the-style-attribute) attribute that sets the 'cursor' property to 'help', then when the user designates that shape, the cursor would change to a Help cursor.

Similarly, if an [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element had a CSS rule that set its 'cursor' property to 'inherit' (or if no rule setting the 'cursor' property matched the element at all), the shape's cursor would be inherited from the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element of the [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map), not from the parent of the [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element.

#### 10.3.6 Toolbars

When a [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) element's [type](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-type) attribute is in the [toolbar](http://www.w3.org/TR/html5/interactive-elements.html#toolbar-state) state, the element is expected to be treated as a replaced element with a height about two lines high and a width derived from the contents of the element.

The element is expected to have, by default, the appearance of a toolbar on the user agent's platform. It is expected to contain the menu that is [built](http://www.w3.org/TR/html5/interactive-elements.html#building-menus-and-toolbars) from the element.

### 10.4 Bindings

#### 10.4.1 Introduction

A number of elements have their rendering defined in terms of the 'binding' property. [[BECSS]](http://www.w3.org/TR/html5/references.html#refsBECSS)

The CSS snippets below set the 'binding' property to a user-agent-defined value, represented below by keywords like *button*. The rules then described for these bindings are only expected to apply if the element's 'binding' property has not been overridden (e.g. by the author) to have another value.

Exactly how the bindings are implemented is not specified by this specification. User agents are encouraged to make their bindings set the 'appearance' CSS property appropriately to achieve platform-native appearances for widgets, and are expected to implement any relevant animations, etc, that are appropriate for the platform. [[CSSUI]](http://www.w3.org/TR/html5/references.html#refsCSSUI)

#### 10.4.2 The [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) element

@namespace url(http://www.w3.org/1999/xhtml);

button { binding: *button*; }

When the *button* binding applies to a [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) element, the element is expected to render as an 'inline-block' box rendered as a button whose contents are the contents of the element.

#### 10.4.3 The [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) element

@namespace url(http://www.w3.org/1999/xhtml);

details { binding: *details*; }

When the *details* binding applies to a [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) element, the element is expected to render as a 'block' box with its 'padding-left' property set to '40px' for left-to-right elements ([LTR-specific](http://www.w3.org/TR/html5/rendering.html#ltr-specific)) and with its 'padding-right' property set to '40px' for right-to-left elements. The element's shadow tree is expected to take the element's first child [summary](http://www.w3.org/TR/html5/interactive-elements.html#the-summary-element) element, if any, and place it in a first 'block' box container, and then take the element's remaining descendants, if any, and place them in a second 'block' box container.

The first container is expected to contain at least one line box, and that line box is expected to contain a disclosure widget (typically a triangle), horizontally positioned within the left padding of the [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) element. That widget is expected to allow the user to request that the details be shown or hidden.

The second container is expected to have its 'overflow' property set to 'hidden'. When the [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) element does not have an [open](http://www.w3.org/TR/html5/interactive-elements.html#attr-details-open) attribute, this second container is expected to be removed from the rendering.

#### 10.4.4 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a text entry widget

@namespace url(http://www.w3.org/1999/xhtml);

input { binding: *input-textfield*; }

input[type=password] { binding: *input-password*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

/\* later rules override this for other values of type="" \*/

When the *input-textfield* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Text](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#text-state-and-search-state), [Search](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#text-state-and-search-state), [Telephone](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#telephone-state), [URL](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#url-state), or [E-mail](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#e-mail-state) state, the element is expected to render as an 'inline-block' box rendered as a text field.

When the *input-password* binding applies, to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Password](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#password-state) state, the element is expected to render as an 'inline-block' box rendered as a text field whose contents are obscured.

If an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in one of the above states has a [size](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-size) attribute, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then the user agent is expected to use the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the 'width' property on the element, with the value obtained from applying the [converting a character width to pixels](http://www.w3.org/TR/html5/rendering.html#converting-a-character-width-to-pixels) algorithm to the value of the attribute.

If an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in one of the above states does not have a [size](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-size) attribute, then the user agent is expected to act as if it had a user-agent-level style sheet rule setting the 'width' property on the element to the value obtained from applying the [converting a character width to pixels](http://www.w3.org/TR/html5/rendering.html#converting-a-character-width-to-pixels) algorithm to the number 20.

The converting a character width to pixels algorithm returns (size-1)×avg + max, where size is the character width to convert, avg is the average character width of the primary font for the element for which the algorithm is being run, in pixels, and max is the maximum character width of that same font, also in pixels. (The element's 'letter-spacing' property does not affect the result.)

#### 10.4.5 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as domain-specific widgets

@namespace url(http://www.w3.org/1999/xhtml);

input[type=datetime] { binding: *input-datetime*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=date] { binding: *input-date*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=month] { binding: *input-month*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=week] { binding: *input-week*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=time] { binding: *input-time*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=datetime-local] { binding: *input-datetime-local*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=number] { binding: *input-number*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

When the *input-datetime* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Date and Time](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#date-and-time-state) state, the element is expected to render as an 'inline-block' box depicting a Date and Time control.

When the *input-date* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Date](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#date-state) state, the element is expected to render as an 'inline-block' box depicting a Date control.

When the *input-month* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Month](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#month-state) state, the element is expected to render as an 'inline-block' box depicting a Month control.

When the *input-week* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Week](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#week-state) state, the element is expected to render as an 'inline-block' box depicting a Week control.

When the *input-time* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Time](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#time-state) state, the element is expected to render as an 'inline-block' box depicting a Time control.

When the *input-datetime-local* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Local Date and Time](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#local-date-and-time-state) state, the element is expected to render as an 'inline-block' box depicting a Local Date and Time control.

When the *input-number* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Number](http://www.w3.org/TR/html5/number-state.html#number-state) state, the element is expected to render as an 'inline-block' box depicting a Number control.

These controls are all expected to be about one line high, and about as wide as necessary to show the widest possible value.

#### 10.4.6 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a range control

@namespace url(http://www.w3.org/1999/xhtml);

input[type=range] { binding: *input-range*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

When the *input-range* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Range](http://www.w3.org/TR/html5/number-state.html#range-state) state, the element is expected to render as an 'inline-block' box depicting a slider control.

When the control is wider than it is tall (or square), the control is expected to be a horizontal slider, with the lowest value on the right if the 'direction' property on this element has a computed value of 'rtl', and on the left otherwise. When the control is taller than it is wide, it is expected to be a vertical slider, with the lowest value on the bottom.

Predefined suggested values (provided by the [list](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-list) attribute) are expected to be shown as tick marks on the slider, which the slider can snap to.

#### 10.4.7 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a color well

@namespace url(http://www.w3.org/1999/xhtml);

input[type=color] { binding: *input-color*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

When the *input-color* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Color](http://www.w3.org/TR/html5/number-state.html#color-state) state, the element is expected to render as an 'inline-block' box depicting a color well, which, when activated, provides the user with a color picker (e.g. a color wheel or color palette) from which the color can be changed.

Predefined suggested values (provided by the [list](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-list) attribute) are expected to be shown in the color picker interface, not on the color well itself.

#### 10.4.8 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a checkbox and radio button widgets

@namespace url(http://www.w3.org/1999/xhtml);

input[type=checkbox] { binding: *input-checkbox*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

input[type=radio] { binding: *input-radio*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

When the *input-checkbox* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Checkbox](http://www.w3.org/TR/html5/number-state.html#checkbox-state) state, the element is expected to render as an 'inline-block' box containing a single checkbox control, with no label.

When the *input-radio* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Radio Button](http://www.w3.org/TR/html5/number-state.html#radio-button-state) state, the element is expected to render as an 'inline-block' box containing a single radio button control, with no label.

#### 10.4.9 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a file upload control

@namespace url(http://www.w3.org/1999/xhtml);

input[type=file] { binding: *input-file*; } /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

When the *input-file* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [File Upload](http://www.w3.org/TR/html5/number-state.html#file-upload-state) state, the element is expected to render as an 'inline-block' box containing a span of text giving the filename(s) of the [selected files](http://www.w3.org/TR/html5/number-state.html#concept-input-type-file-selected), if any, followed by a button that, when activated, provides the user with a file picker from which the selection can be changed.

#### 10.4.10 The [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element as a button

@namespace url(http://www.w3.org/1999/xhtml);

input[type=submit], input[type=reset], input[type=button] { /\* [case-insensitive](http://www.w3.org/TR/html5/rendering.html#case-insensitive-selector-exception) \*/

binding: *input-button*;

}

When the *input-button* binding applies to an [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element whose [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is in the [Submit Button](http://www.w3.org/TR/html5/number-state.html#submit-button-state), [Reset Button](http://www.w3.org/TR/html5/number-state.html#reset-button-state), or [Button](http://www.w3.org/TR/html5/number-state.html#button-state) state, the element is expected to render as an 'inline-block' box rendered as a button, about one line high, containing the contents of the element's [value](http://www.w3.org/TR/html5/the-input-element.html#attr-input-value) attribute, if any, or text derived from the element's [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute in a user-agent-defined (and probably locale-specific) fashion, if not.

#### 10.4.11 The [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element

@namespace url(http://www.w3.org/1999/xhtml);

marquee { binding: *marquee*; }

When the *marquee* binding applies to a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element, while the element is [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on), the element is expected to render in an animated fashion according to its attributes as follows:

If the element's [behavior](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior) attribute is in the [scroll](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior-scroll) state

Slide the contents of the element in the direction described by the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute as defined below, such that it begins off the start side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), and ends flush with the inner end side.

For example, if the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute is [left](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-left) (the default), then the contents would start such that their left edge are off the side of the right edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area, and the contents would then slide up to the point where the left edge of the contents are flush with the left inner edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area.

Once the animation has ended, the user agent is expected to [increment the marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#increment-the-marquee-current-loop-index). If the element is still [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on) after this, then the user agent is expected to restart the animation.

If the element's [behavior](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior) attribute is in the [slide](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior-slide) state

Slide the contents of the element in the direction described by the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute as defined below, such that it begins off the start side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), and ends off the end side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element).

For example, if the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute is [left](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-left) (the default), then the contents would start such that their left edge are off the side of the right edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area, and the contents would then slide up to the point where the right edge of the contents are flush with the left inner edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area.

Once the animation has ended, the user agent is expected to [increment the marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#increment-the-marquee-current-loop-index). If the element is still [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on) after this, then the user agent is expected to restart the animation.

If the element's [behavior](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior) attribute is in the [alternate](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior-alternate) state

When the [marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#marquee-current-loop-index) is even (or zero), slide the contents of the element in the direction described by the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute as defined below, such that it begins flush with the start side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), and ends flush with the end side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element).

When the [marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#marquee-current-loop-index) is odd, slide the contents of the element in the opposite direction than that described by the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute as defined below, such that it begins flush with the end side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), and ends flush with the start side of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element).

For example, if the [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute is [left](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-left) (the default), then the contents would with their right edge flush with the right inner edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area, and the contents would then slide up to the point where the left edge of the contents are flush with the left inner edge of the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)'s content area.

Once the animation has ended, the user agent is expected to [increment the marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#increment-the-marquee-current-loop-index). If the element is still [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on) after this, then the user agent is expected to continue the animation.

The [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute has the meanings described in the following table:

| [**direction**](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) **attribute state** | **Direction of animation** | **Start edge** | **End edge** | **Opposite direction** |
| --- | --- | --- | --- | --- |
| [left](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-left) | ← Right to left | Right | Left | → Left to Right |
| [right](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-right) | → Left to Right | Left | Right | ← Right to left |
| [up](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-up) | ↑ Up (Bottom to Top) | Bottom | Top | ↓ Down (Top to Bottom) |
| [down](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-down) | ↓ Down (Top to Bottom) | Top | Bottom | ↑ Up (Bottom to Top) |

In any case, the animation should proceed such that there is a delay given by the [marquee scroll interval](http://www.w3.org/TR/html5/obsolete.html#marquee-scroll-interval) between each frame, and such that the content moves at most the distance given by the [marquee scroll distance](http://www.w3.org/TR/html5/obsolete.html#marquee-scroll-distance) with each frame.

When a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element has a bgcolor attribute set, the value is expected to be parsed using the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value), and if that does not return an error, the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'background-color' property to the resulting color.

The width and height attributes on a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element [map to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'width' and 'height' on the element respectively.

The intrinsic height of a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element with its [direction](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction) attribute in the [up](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-up) or [down](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-down) states is 200 CSS pixels.

The vspace attribute of a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-top' and 'margin-bottom' on the element. The hspace attribute of a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element [maps to the dimension properties](http://www.w3.org/TR/html5/rendering.html#maps-to-the-dimension-property) 'margin-left' and 'margin-right' on the element.

The 'overflow' property on the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element is expected to be ignored; overflow is expected to always be hidden.

#### 10.4.12 The [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element) element

@namespace url(http://www.w3.org/1999/xhtml);

meter { binding: *meter*; }

When the *meter* binding applies to a [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element) element, the element is expected to render as an 'inline-block' box with a 'height' of '1em' and a 'width' of '5em', a 'vertical-align' of '-0.2em', and with its contents depicting a gauge.

When the element is wider than it is tall (or square), the depiction is expected to be of a horizontal gauge, with the minimum value on the right if the 'direction' property on this element has a computed value of 'rtl', and on the left otherwise. When the element is taller than it is wide, it is expected to depict a vertical gauge, with the minimum value on the bottom.

User agents are expected to use a presentation consistent with platform conventions for gauges, if any.

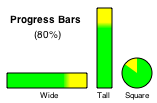
Requirements for what must be depicted in the gauge are included in the definition of the [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element) element.

#### 10.4.13 The [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element) element

@namespace url(http://www.w3.org/1999/xhtml);

progress { binding: *progress*; }

When the *progress* binding applies to a [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element) element, the element is expected to render as an 'inline-block' box with a 'height' of '1em' and a 'width' of '10em', and a 'vertical-align' of '-0.2em'.

When the element is wider than it is tall, the element is expected to be depicted as a horizontal progress bar, with the start on the right and the end on the left if the 'direction' property on this element has a computed value of 'rtl', and with the start on the left and the end on the right otherwise. When the element is taller than it is wide, it is expected to depicted as a vertical progress bar, with the lowest value on the bottom. When the element is square, it is expected to be depicted as a direction-independent progress widget (e.g. a circular progress ring).

User agents are expected to use a presentation consistent with platform conventions for progress bars. In particular, user agents are expected to use different presentations for determinate and indeterminate progress bars. User agents are also expected to vary the presentation based on the dimensions of the element.

For example, on some platforms for showing indeterminate progress there is an asynchronous progress indicator with square dimensions, which could be used when the element is square, and an indeterminate progress bar, which could be used when the element is wide.

Requirements for how to determine if the progress bar is determinate or indeterminate, and what progress a determinate progress bar is to show, are included in the definition of the [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element) element.

#### 10.4.14 The [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element

@namespace url(http://www.w3.org/1999/xhtml);

select { binding: *select*; }

When the *select* binding applies to a [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element whose [multiple](http://www.w3.org/TR/html5/the-button-element.html#attr-select-multiple) attribute is present, the element is expected to render as a multi-select list box.

When the *select* binding applies to a [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element whose [multiple](http://www.w3.org/TR/html5/the-button-element.html#attr-select-multiple) attribute is absent, and the element's [display size](http://www.w3.org/TR/html5/the-button-element.html#concept-select-size) is greater than 1, the element is expected to render as a single-select list box.

When the element renders as a list box, it is expected to render as an 'inline-block' box whose 'height' is the height necessary to contain as many rows for items as given by the element's [display size](http://www.w3.org/TR/html5/the-button-element.html#concept-select-size), or four rows if the attribute is absent, and whose 'width' is the [width of the select's labels](http://www.w3.org/TR/html5/rendering.html#width-of-the-select-s-labels) plus the width of a scrollbar.

When the *select* binding applies to a [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element whose [multiple](http://www.w3.org/TR/html5/the-button-element.html#attr-select-multiple) attribute is absent, and the element's [display size](http://www.w3.org/TR/html5/the-button-element.html#concept-select-size) is 1, the element is expected to render as a one-line drop down box whose width is the [width of the select's labels](http://www.w3.org/TR/html5/rendering.html#width-of-the-select-s-labels).

In either case (list box or drop-down box), the element's items are expected to be the element's [list of options](http://www.w3.org/TR/html5/the-button-element.html#concept-select-option-list), with the element's [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element children providing headers for groups of options where applicable.

An [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element is expected to be rendered by displaying the element's [label](http://www.w3.org/TR/html5/the-button-element.html#attr-optgroup-label) attribute.

An [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) element is expected to be rendered by displaying the element's [label](http://www.w3.org/TR/html5/the-button-element.html#concept-option-label), indented under its [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) element if it has one.

The width of the *select*'s labels is the wider of the width necessary to render the widest [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element), and the width necessary to render the widest [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) element in the element's [list of options](http://www.w3.org/TR/html5/the-button-element.html#concept-select-option-list) (including its indent, if any).

If a [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element contains a [placeholder label option](http://www.w3.org/TR/html5/the-button-element.html#placeholder-label-option), the user agent is expected to render that [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) in a manner that conveys that it is a label, rather than a valid option of the control. This can include preventing the [placeholder label option](http://www.w3.org/TR/html5/the-button-element.html#placeholder-label-option) from being explicitly selected by the user. When the [placeholder label option](http://www.w3.org/TR/html5/the-button-element.html#placeholder-label-option)'s [selectedness](http://www.w3.org/TR/html5/the-button-element.html#concept-option-selectedness) is true, the control is expected to be displayed in a fashion that indicates that no valid option is currently selected.

User agents are expected to render the labels in a [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) in such a manner that any alignment remains consistent whether the label is being displayed as part of the page or in a menu control.

#### 10.4.15 The [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) element

@namespace url(http://www.w3.org/1999/xhtml);

textarea { binding: *textarea*; white-space: pre-wrap; }

When the *textarea* binding applies to a [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) element, the element is expected to render as an 'inline-block' box rendered as a multiline text field.

If the element has a [cols](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-cols) attribute, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then the user agent is expected to use the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the 'width' property on the element, with the value being the [textarea effective width](http://www.w3.org/TR/html5/rendering.html#textarea-effective-width) (as defined below). Otherwise, the user agent is expected to act as if it had a user-agent-level style sheet rule setting the 'width' property on the element to the [textarea effective width](http://www.w3.org/TR/html5/rendering.html#textarea-effective-width).

The textarea effective width of a [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) element is size×avg + sbw, where size is the element's [character width](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-cols-value), avg is the average character width of the primary font of the element, in CSS pixels, and sbw is the width of a scroll bar, in CSS pixels. (The element's 'letter-spacing' property does not affect the result.)

If the element has a [rows](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-rows) attribute, and parsing that attribute's value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) doesn't generate an error, then the user agent is expected to use the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) for the 'height' property on the element, with the value being the [textarea effective height](http://www.w3.org/TR/html5/rendering.html#textarea-effective-height) (as defined below). Otherwise, the user agent is expected to act as if it had a user-agent-level style sheet rule setting the 'height' property on the element to the [textarea effective height](http://www.w3.org/TR/html5/rendering.html#textarea-effective-height).

The textarea effective height of a [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) element is the height in CSS pixels of the number of lines specified the element's [character height](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-rows-value), plus the height of a scrollbar in CSS pixels.

User agents are expected to apply the 'white-space' CSS property to [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements. For historical reasons, if the element has a [wrap](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-wrap) attribute whose value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "off", then the user agent is expected to treat the attribute as a [presentational hint](http://www.w3.org/TR/html5/rendering.html#presentational-hints) setting the element's 'white-space' property to 'pre'.

#### 10.4.16 The [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element) element

@namespace url(http://www.w3.org/1999/xhtml);

keygen { binding: *keygen*; }

When the *keygen* binding applies to a [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element) element, the element is expected to render as an 'inline-block' box containing a user interface to configure the key pair to be generated.

#### 10.4.17 The [time](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element) element

@namespace url(http://www.w3.org/1999/xhtml);

time[datetime] { binding: *time*; }

When the *time* binding applies to a [time](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element) element, the element is expected to render as if it contained text conveying the [date](http://www.w3.org/TR/html5/text-level-semantics.html#concept-time-date) (if known), [time](http://www.w3.org/TR/html5/text-level-semantics.html#concept-time-time) (if known), and [time-zone offset](http://www.w3.org/TR/html5/text-level-semantics.html#concept-time-timezone) (if known) represented by the element, in the fashion most convenient for the user.

### 10.5 Frames and framesets

When an [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element's second child element is a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, the user agent is expected to render the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element as described below across the surface of the viewport, instead of applying the usual CSS rendering rules.

When rendering a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) on a surface, the user agent is expected to use the following layout algorithm:

1. The cols and rows variables are lists of zero or more pairs consisting of a number and a unit, the unit being one of *percentage*, *relative*, and *absolute*.

Use the [rules for parsing a list of dimensions](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-list-of-dimensions) to parse the value of the element's cols attribute, if there is one. Let cols be the result, or an empty list if there is no such attribute.

Use the [rules for parsing a list of dimensions](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-list-of-dimensions) to parse the value of the element's rows attribute, if there is one. Let rows be the result, or an empty list if there is no such attribute.

1. For any of the entries in cols or rows that have the number zero and the unit *relative*, change the entry's number to one.
2. If cols has no entries, then add a single entry consisting of the value 1 and the unit *relative* to cols.

If rows has no entries, then add a single entry consisting of the value 1 and the unit *relative* to rows.

1. Invoke the algorithm defined below to [convert a list of dimensions to a list of pixel values](http://www.w3.org/TR/html5/rendering.html#convert-a-list-of-dimensions-to-a-list-of-pixel-values) using cols as the input list, and the width of the surface that the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) is being rendered into, in CSS pixels, as the input dimension. Let sized cols be the resulting list.

Invoke the algorithm defined below to [convert a list of dimensions to a list of pixel values](http://www.w3.org/TR/html5/rendering.html#convert-a-list-of-dimensions-to-a-list-of-pixel-values) using rows as the input list, and the height of the surface that the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) is being rendered into, in CSS pixels, as the input dimension. Let sized rows be the resulting list.

1. Split the surface into a grid of w×h rectangles, where w is the number of entries in sized cols and h is the number of entries in sized rows.

Size the columns so that each column in the grid is as many CSS pixels wide as the corresponding entry in the sized cols list.

Size the rows so that each row in the grid is as many CSS pixels high as the corresponding entry in the sized rows list.

1. Let children be the list of [frame](http://www.w3.org/TR/html5/obsolete.html#frame) and [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) elements that are children of the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element for which the algorithm was invoked.
2. For each row of the grid of rectangles created in the previous step, from top to bottom, run these substeps:
   1. For each rectangle in the row, from left to right, run these substeps:
      1. If there are any elements left in children, take the first element in the list, and assign it to the rectangle.

If this is a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, then recurse the entire [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) layout algorithm for that [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, with the rectangle as the surface.

Otherwise, it is a [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element; create a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) sized to fit the rectangle.

* + 1. If there are any elements left in children, remove the first element from children.

1. If the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element [has a border](http://www.w3.org/TR/html5/rendering.html#has-a-border), draw an outer set of borders around the rectangles, using the element's [frame border color](http://www.w3.org/TR/html5/rendering.html#frame-border-color).

For each rectangle, if there is an element assigned to that rectangle, and that element [has a border](http://www.w3.org/TR/html5/rendering.html#has-a-border), draw an inner set of borders around that rectangle, using the element's [frame border color](http://www.w3.org/TR/html5/rendering.html#frame-border-color).

For each (visible) border that does not abut a rectangle that is assigned a [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element with a noresize attribute (including rectangles in further nested [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) elements), the user agent is expected to allow the user to move the border, resizing the rectangles within, keeping the proportions of any nested [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) grids.

A [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) or [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element has a border if the following algorithm returns true:

* 1. If the element has a frameborder attribute whose value is not the empty string and whose first character is either a U+0031 DIGIT ONE (1) character, a U+0079 LATIN SMALL LETTER Y character (y), or a U+0059 LATIN CAPITAL LETTER Y character (Y), then return true.
  2. Otherwise, if the element has a frameborder attribute, return false.
  3. Otherwise, if the element has a parent element that is a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, then return true if that element [has a border](http://www.w3.org/TR/html5/rendering.html#has-a-border), and false if it does not.
  4. Otherwise, return true.

The frame border color of a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) or [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element is the color obtained from the following algorithm:

* 1. If the element has a bordercolor attribute, and applying the [rules for parsing a legacy color value](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-a-legacy-color-value) to that attribute's value does not result in an error, then return the color so obtained.
  2. Otherwise, if the element has a parent element that is a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, then the [frame border color](http://www.w3.org/TR/html5/rendering.html#frame-border-color) of that element.
  3. Otherwise, return gray.

The algorithm to convert a list of dimensions to a list of pixel values consists of the following steps:

1. Let input list be the list of numbers and units passed to the algorithm.

Let output list be a list of numbers the same length as input list, all zero.

Entries in output list correspond to the entries in input list that have the same position.

1. Let input dimension be the size passed to the algorithm.
2. Let count percentage be the number of entries in input list whose unit is *percentage*.

Let total percentage be the sum of all the numbers in input list whose unit is *percentage*.

Let count relative be the number of entries in input list whose unit is *relative*.

Let total relative be the sum of all the numbers in input list whose unit is *relative*.

Let count absolute be the number of entries in input list whose unit is *absolute*.

Let total absolute be the sum of all the numbers in input list whose unit is *absolute*.

Let remaining space be the value of input dimension.

1. If total absolute is greater than remaining space, then for each entry in input list whose unit is *absolute*, set the corresponding value in output list to the number of the entry in input list multiplied by remaining space and divided by total absolute. Then, set remaining space to zero.

Otherwise, for each entry in input list whose unit is *absolute*, set the corresponding value in output list to the number of the entry in input list. Then, decrement remaining space by total absolute.

1. If total percentage multiplied by the input dimension and divided by 100 is greater than remaining space, then for each entry in input list whose unit is *percentage*, set the corresponding value in output list to the number of the entry in input list multiplied by remaining space and divided by total percentage. Then, set remaining space to zero.

Otherwise, for each entry in input list whose unit is *percentage*, set the corresponding value in output list to the number of the entry in input list multiplied by the input dimension and divided by 100. Then, decrement remaining space by total percentage multiplied by the input dimension and divided by 100.

1. For each entry in input list whose unit is *relative*, set the corresponding value in output list to the number of the entry in input list multiplied by remaining space and divided by total relative.
2. Return output list.

User agents working with integer values for frame widths (as opposed to user agents that can lay frames out with subpixel accuracy) are expected to distribute the remainder first to the last entry whose unit is *relative*, then equally (not proportionally) to each entry whose unit is *percentage*, then equally (not proportionally) to each entry whose unit is *absolute*, and finally, failing all else, to the last entry.

### 10.6 Interactive media

#### 10.6.1 Links, forms, and navigation

User agents are expected to allow the user to control aspects of [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) activation and [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission), such as which [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) is to be used for the subsequent [navigation](http://www.w3.org/TR/html5/history.html#navigate).

User agents are expected to allow users to discover the destination of [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink) and of [forms](http://www.w3.org/TR/html5/forms.html#the-form-element) before triggering their [navigation](http://www.w3.org/TR/html5/history.html#navigate).

User agents are expected to allow users to [navigate](http://www.w3.org/TR/html5/history.html#navigate) [browsing contexts](http://www.w3.org/TR/html5/browsers.html#browsing-context) to the resources [indicated](http://www.w3.org/TR/html5/urls.html#resolve-a-url) by the cite attributes on [q](http://www.w3.org/TR/html5/text-level-semantics.html#the-q-element), [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element), [ins](http://www.w3.org/TR/html5/edits.html#the-ins-element), and [del](http://www.w3.org/TR/html5/edits.html#the-del-element) elements.

User agents are expected to surface [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink) created by [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements in their user interface.

While [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements that create [hyperlinks](http://www.w3.org/TR/html5/links.html#hyperlink) will match the ':link' or ':visited' pseudo-classes, will react to clicks if visible, and so forth, this does not extend to any browser interface constructs that expose those same links. Activating a link through the browser's interface, rather than in the page itself, does not trigger [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) events and the like.

#### 10.6.2 The [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute

Given an element (e.g. the element designated by the mouse cursor), if the element, or one of its ancestors, has a [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute, and the nearest such attribute has a value that is not the empty string, it is expected that the user agent will expose the contents of that attribute as a tooltip.

U+000A LINE FEED (LF) characters are expected to cause line breaks in the tooltip, U+0009 CHARACTER TABULATION (tab) characters are expected to render as a non-zero horizontal shift that lines up the next glpyh with the next tab stop, with tab stops occurring at points that are multiples of 8 times the width of a U+0020 SPACE character.

User agents are encouraged to make it possible to view tooltips without the use of a pointing device, since not all users are able to use pointing devices.

For example, a visual user agent could make elements with a [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute focusable, and could make any focused element with a [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute show its tooltip under the element while the element has focus. This would allow a user to tab around the document to find all the advisory text.

As another example, a screen reader could provide an audio cue when reading an element with a tooltip, with an associated key to read the last tooltip for which a cue was played.

#### 10.6.3 Editing hosts

The current text editing caret (the one at the [caret position](http://www.w3.org/TR/html5/editing.html#caret-position) in a focused [editing host](http://www.w3.org/TR/html5/editing.html#editing-host)) is expected to act like an inline replaced element with the vertical dimensions of the caret and with zero width for the purposes of the CSS rendering model.

This means that even an empty block can have the caret inside it, and that when the caret is in such an element, it prevents margins from collapsing through the element.

#### 10.6.4 Text rendered in native user interfaces

User agents are expected to honor the Unicode semantics of text that is exposed in user interfaces, for example supporting the bidirectional algorithm in text shown in dialogs, title bars, pop-up menus, and tooltips. Text from elements (either attribute values or the contents of elements) is expected to be rendered in a manner that honors [the directionality](http://www.w3.org/TR/html5/elements.html#the-directionality) of the element from which the text was obtained.

Consider the following markup, which has Hebrew text asking for a programming language, the languages being text for which a left-to-right direction is important given the punctuation in some of their names:

<p dir="rtl" lang="he">

<label>

בחר שפת תכנות:

<select>

<option dir="ltr">C++</option>

<option dir="ltr">C#</option>

<option dir="ltr">FreePascal</option>

<option dir="ltr">F#</option>

</select>

</label>

</p>

If the [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) element was rendered as a drop down box, a correct rendering would ensure that the punctuation was the same both in the drop down, and in the box showing the current selection.



A string provided by a script (e.g. the argument to [window.alert()](http://www.w3.org/TR/html5/timers.html#dom-alert)) is expected to be treated as an independent set of one or more bidirectional algorithm paragraphs when displayed, as defined by the bidirectional algorithm, including, for instance, supporting the paragraph-breaking behaviour of U+000A LINE FEED (LF) characters. For the purposes of determining the paragraph level of such text in the bidirectional algorithm, this specification does not provide a higher-level override of rules P2 and P3. [[BIDI]](http://www.w3.org/TR/html5/references.html#refsBIDI)

When necessary, authors can enforce a particular direction for a given paragraph by starting it with the Unicode U+200E LEFT-TO-RIGHT MARK or U+200F RIGHT-TO-LEFT MARK characters.

Thus, the following script:

alert('\u05DC\u05DE\u05D3 HTML \u05D4\u05D9\u05D5\u05DD!')

...would always result in a message reading "למד LMTH היום!" (not "דמל HTML םויה!"), regardless of the language of the user agent interface or the direction of the page or any of its elements.

For a more complex example, consider the following script:

/\* Warning: this script does not handle right-to-left scripts correctly \*/

var s;

if (s = prompt('What is your name?')) {

alert(s + '! Ok, Fred, ' + s + ', and Wilma will get the car.');

}

When the user enters "Kitty", the user agent would alert "Kitty! Ok, Fred, Kitty, and Wilma will get the car.". However, if the user enters "لا أفهم", then the bidirectional algorithm will determine that the direction of the paragraph is right-to-left, and so the output will be the following unintended mess: "لا أفهم! derF ,kO, لا أفهم, rac eht teg lliw amliW dna."

To force an alert that starts with user-provided text (or other text of unknown directionality) to render left-to-right, the string can be prefixed with a U+200E LEFT-TO-RIGHT MARK character:

var s;

if (s = prompt('What is your name?')) {

alert('**\u200E**' + s + '! Ok, Fred, ' + s + ', and Wilma will get the car.');

}

### 10.7 Print media

User agents are expected to allow the user to request the opportunity to obtain a physical form (or a representation of a physical form) of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document). For example, selecting the option to print a page or convert it to PDF format.

When the user actually [obtains a physical form](http://www.w3.org/TR/html5/rendering.html#obtain-a-physical-form) (or a representation of a physical form) of a [Document](http://www.w3.org/TR/html5/infrastructure.html#document), the user agent is expected to create a new rendering of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) for the print media.

## 11 Obsolete features

### 11.1 Obsolete but conforming features

Features listed in this section will trigger warnings in conformance checkers.

Authors should not specify a [border](http://www.w3.org/TR/html5/obsolete.html#attr-img-border) attribute on an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element. If the attribute is present, its value must be the string "0". CSS should be used instead.

Authors should not specify a [language](http://www.w3.org/TR/html5/obsolete.html#attr-script-language) attribute on a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element. If the attribute is present, its value must be an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "JavaScript" and either the [type](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type) attribute must be omitted or its value must be an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "text/javascript". The attribute should be entirely omitted instead (with the value "JavaScript", it has no effect), or replaced with use of the [type](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type) attribute.

Authors should not specify the [name](http://www.w3.org/TR/html5/obsolete.html#attr-a-name) attribute on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements. If the attribute is present, its value must not be the empty string and must neither be equal to the value of any of the [IDs](http://www.w3.org/TR/html5/elements.html#concept-id) in the element's [home subtree](http://www.w3.org/TR/html5/infrastructure.html#home-subtree) other than the element's own [ID](http://www.w3.org/TR/html5/elements.html#concept-id), if any, nor be equal to the value of any of the other [name](http://www.w3.org/TR/html5/obsolete.html#attr-a-name) attributes on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements in the element's [home subtree](http://www.w3.org/TR/html5/infrastructure.html#home-subtree). If this attribute is present and the element has an [ID](http://www.w3.org/TR/html5/elements.html#concept-id), then the attribute's value must be equal to the element's [ID](http://www.w3.org/TR/html5/elements.html#concept-id). In earlier versions of the language, this attribute was intended as a way to specify possible targets for fragment identifiers in [URLs](http://www.w3.org/TR/html5/urls.html#url). The [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) attribute should be used instead.

In [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax), specifying a [DOCTYPE](http://www.w3.org/TR/html5/syntax.html#syntax-doctype) that is an [obsolete permitted DOCTYPE](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype) will also trigger a warning.

#### 11.1.1 Warnings for obsolete but conforming features

To ease the transition from HTML4 Transitional documents to the language defined in this specification, and to discourage certain features that are only allowed in very few circumstances, conformance checkers are required to warn the user when the following features are used in a document. These are generally old obsolete features that have no effect, and are allowed only to distinguish between likely mistakes (regular conformance errors) and mere vestigial markup or unusual and discouraged practices (these warnings).

The following features must be categorized as described above:

* The presence of an [obsolete permitted DOCTYPE](http://www.w3.org/TR/html5/syntax.html#obsolete-permitted-doctype) in an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents).
* The presence of a [border](http://www.w3.org/TR/html5/obsolete.html#attr-img-border) attribute on an [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element if its value is the string "0".
* The presence of a [language](http://www.w3.org/TR/html5/obsolete.html#attr-script-language) attribute on a [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element if its value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "JavaScript" and if there is no [type](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type) attribute or there is and its value is an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the string "text/javascript".
* The presence of a [name](http://www.w3.org/TR/html5/obsolete.html#attr-a-name) attribute on an [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element, if its value is not the empty string.

Conformance checkers must distinguish between pages that have no conformance errors and have none of these obsolete features, and pages that have no conformance errors but do have some of these obsolete features.

For example, a validator could report some pages as "Valid HTML" and others as "Valid HTML with warnings".

### 11.2 Non-conforming features

Elements in the following list are entirely obsolete, and must not be used by authors:

[applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element)

Use [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) or [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) instead.

*acronym*

Use [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element) instead.

*bgsound*

Use [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) instead.

*dir*

Use [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) instead.

[frame](http://www.w3.org/TR/html5/obsolete.html#frame)

[frameset](http://www.w3.org/TR/html5/obsolete.html#frameset)

*noframes*

Either use [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) and CSS instead, or use server-side includes to generate complete pages with the various invariant parts merged in.

*isindex*

Use an explicit [form](http://www.w3.org/TR/html5/forms.html#the-form-element) and [text field](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#text-state-and-search-state) combination instead.

*listing*

Use [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) and [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element) instead.

*nextid*

Use GUIDs instead.

*noembed*

Use [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) instead of [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) when fallback is necessary.

*plaintext*

Use the "text/plain" [MIME type](http://www.w3.org/TR/html5/infrastructure.html#mime-type) instead.

*rb*

Providing the ruby base directly inside the [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) element is sufficient; the [rb](http://www.w3.org/TR/html5/obsolete.html#rb) element is unnecessary. Omit it altogether.

*strike*

Use [del](http://www.w3.org/TR/html5/edits.html#the-del-element) instead if the element is marking an edit, otherwise use [s](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element) instead.

*xmp*

Use [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element) instead, and escape "<" and "&" characters as "&lt;" and "&amp;" respectively.

*basefont*

*big*

*blink*

*center*

*font*

[marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element)

*multicol*

*nobr*

*spacer*

*tt*

Use appropriate elements and/or CSS instead.

Where the [tt](http://www.w3.org/TR/html5/obsolete.html#tt) element would have been used for marking up keyboard input, consider the [kbd](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element) element; for variables, consider the [var](http://www.w3.org/TR/html5/text-level-semantics.html#the-var-element) element; for computer code, consider the [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element) element; and for computer output, consider the [samp](http://www.w3.org/TR/html5/text-level-semantics.html#the-samp-element) element.

Similarly, if the [big](http://www.w3.org/TR/html5/obsolete.html#big) element is being used to denote a heading, consider using the [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) element; if it is being used for marking up important passages, consider the [strong](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element) element; and if it is being used for highlighting text for reference purposes, consider the [mark](http://www.w3.org/TR/html5/text-level-semantics.html#the-mark-element) element.

See also the [text-level semantics usage summary](http://www.w3.org/TR/html5/text-level-semantics.html#usage-summary) for more suggestions with examples.

The following attributes are obsolete (though the elements are still part of the language), and must not be used by authors:

*charset* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

*charset* on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements

Use an HTTP Content-Type header on the linked resource instead.

*coords* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

*shape* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

Use [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) instead of [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) for image maps.

*methods* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

*methods* on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements

Use the HTTP OPTIONS feature instead.

*name* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements (except as noted in the previous section)

*name* on [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements

*name* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

*name* on [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) elements

Use the [id](http://www.w3.org/TR/html5/elements.html#the-id-attribute) attribute instead.

*rev* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

*rev* on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements

Use the [rel](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel) attribute instead, with an opposite term. (For example, instead of rev="made", use rel="author".)

*urn* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements

*urn* on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements

Specify the preferred persistent identifier using the [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute instead.

*nohref* on [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) elements

Omitting the [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) attribute is sufficient; the [nohref](http://www.w3.org/TR/html5/obsolete.html#attr-area-nohref) attribute is unnecessary. Omit it altogether.

*profile* on [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) elements

When used for declaring which [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) terms are used in the document, unnecessary; omit it altogether, and [register the names](http://www.w3.org/TR/html5/semantics.html#concept-meta-extensions).

When used for triggering specific user agent behaviors: use a [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element instead.

*version* on [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) elements

Unnecessary. Omit it altogether.

*usemap* on [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements

Use [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) instead of [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) for image maps.

*longdesc* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*longdesc* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

Use a regular [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element to link to the description, or (in the case of images) use an [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) to provide a link from the image to the image's description.

*lowsrc* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

Use a progressive JPEG image (given in the [src](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-src) attribute), instead of using two separate images.

*target* on [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) elements

Unnecessary. Omit it altogether.

*scheme* on [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements

Use only one scheme per field, or make the scheme declaration part of the value.

*archive* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*classid* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*code* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*codebase* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*codetype* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

Use the [data](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-data) and [type](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-type) attributes to invoke [plugins](http://www.w3.org/TR/html5/infrastructure.html#plugin). To set parameters with these names in particular, the [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) element can be used.

*declare* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

Repeat the [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element completely each time the resource is to be reused.

*standby* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

Optimize the linked resource so that it loads quickly or, at least, incrementally.

*type* on [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) elements

*valuetype* on [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) elements

Use the [name](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-name) and [value](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-value) attributes without declaring value types.

*language* on [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements (except as noted in the previous section)

Use the [type](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type) attribute instead.

*event* on [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements

*for* on [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) elements

Use DOM Events mechanisms to register event listeners. [[DOMEVENTS]](http://www.w3.org/TR/html5/references.html#refsDOMEVENTS)

*datapagesize* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

Unnecessary. Omit it altogether.

*summary* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

Use one of the [techniques for describing tables](http://www.w3.org/TR/html5/tabular-data.html#table-descriptions-techniques) given in the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) section instead.

*abbr* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

Use text that begins in an unambiguous and terse manner, and include any more elaborate text after that. The [title](http://www.w3.org/TR/html5/elements.html#the-title-attribute) attribute can also be useful in including more detailed text, so that the cell's contents can be made terse.

*axis* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

Use the [scope](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope) attribute on the relevant [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element).

*datasrc* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element), [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element), [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [frame](http://www.w3.org/TR/html5/obsolete.html#frame), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element), [label](http://www.w3.org/TR/html5/forms.html#the-label-element), [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element), [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element), [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element), [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element), [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element), [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), and [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements

*datafld* on [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element), [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element), [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element), [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element), [frame](http://www.w3.org/TR/html5/obsolete.html#frame), [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element), [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element), [label](http://www.w3.org/TR/html5/forms.html#the-label-element), [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element), [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element), [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element), [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element), [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element), and [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) elements

*dataformatas* on [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element), [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element), [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element), [label](http://www.w3.org/TR/html5/forms.html#the-label-element), [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element), [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element), [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element), [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element), [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element), [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element), and [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

Use script and a mechanism such as XMLHttpRequest to populate the page dynamically. [[XHR]](http://www.w3.org/TR/html5/references.html#refsXHR)

*alink* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*bgcolor* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*link* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*marginbottom* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*marginheight* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*marginleft* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*marginright* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*margintop* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*marginwidth* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*text* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*vlink* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element) elements

*clear* on [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) elements

*align* on [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element) elements

*align* on [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) elements

*char* on [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) elements

*charoff* on [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) elements

*valign* on [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) elements

*width* on [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) elements

*align* on [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) elements

*compact* on [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) elements

*align* on [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements

*hspace* on [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements

*vspace* on [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) elements

*align* on [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) elements

*color* on [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) elements

*noshade* on [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) elements

*size* on [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) elements

*width* on [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) elements

*align* on [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)—[h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) elements

*align* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*allowtransparency* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*frameborder* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*hspace* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*marginheight* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*marginwidth* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*scrolling* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*vspace* on [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) elements

*align* on [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements

*hspace* on [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements

*vspace* on [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) elements

*align* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

*border* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements (except as noted in the previous section)

*hspace* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

*vspace* on [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) elements

*align* on [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) elements

*type* on [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) elements

*compact* on [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) elements

*align* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*border* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*hspace* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*vspace* on [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) elements

*compact* on [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) elements

*align* on [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) elements

*width* on [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) elements

*align* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*bgcolor* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*cellpadding* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*cellspacing* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*frame* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*rules* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*width* on [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) elements

*align* on [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements

*char* on [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements

*charoff* on [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements

*valign* on [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements

*align* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*bgcolor* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*char* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*charoff* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*height* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*nowrap* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*valign* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*width* on [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

*align* on [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements

*bgcolor* on [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements

*char* on [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements

*charoff* on [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements

*valign* on [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) elements

*compact* on [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) elements

*type* on [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) elements

*background* on [body](http://www.w3.org/TR/html5/sections.html#the-body-element), [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element), [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element), [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element), and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements

Use CSS instead.

The [border](http://www.w3.org/TR/html5/tabular-data.html#attr-table-border) attribute on the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element can be used to provide basic fallback styling for the purpose of making tables legible in browsing environments where CSS support is limited or absent, such as text-based browsers, WYSIWYG editors, and in situations where CSS support is disabled or the style sheet is lost. Only the empty string and the value "1" may be used as [border](http://www.w3.org/TR/html5/tabular-data.html#attr-table-border) values for this purpose. Other values are considered obsolete. To regulate the thickness of such borders, authors should instead use CSS.

### 11.3 Requirements for implementations

#### 11.3.1 The applet element

The [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element is a Java-specific variant of the [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) element. The [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element is now obsoleted so that all extension frameworks (Java, .NET, Flash, etc) are handled in a consistent manner.

When the element is still in the [stack of open elements](http://www.w3.org/TR/html5/parsing.html#stack-of-open-elements) of an [HTML parser](http://www.w3.org/TR/html5/parsing.html#html-parser) or [XML parser](http://www.w3.org/TR/html5/the-xhtml-syntax.html#xml-parser), and when the element is not [in a Document](http://www.w3.org/TR/html5/infrastructure.html#in-a-document), and when the element's document is not [fully active](http://www.w3.org/TR/html5/browsers.html#fully-active), and when the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) had its [sandboxed plugins browsing context flag](http://www.w3.org/TR/html5/the-iframe-element.html#sandboxed-plugins-browsing-context-flag) when that [Document](http://www.w3.org/TR/html5/infrastructure.html#document) was created, and when the element's [Document](http://www.w3.org/TR/html5/infrastructure.html#document) was parsed from a resource whose [sniffed type](http://www.w3.org/TR/html5/fetching-resources.html#content-type-sniffing-0) as determined during [navigation](http://www.w3.org/TR/html5/history.html#navigate) is [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed), and when the element has an ancestor [media element](http://www.w3.org/TR/html5/the-iframe-element.html#media-element), and when the element has an ancestor [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element that is not showing its [fallback content](http://www.w3.org/TR/html5/content-models.html#fallback-content), and when no Java Language runtime [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) is available, and when one is available but it is disabled, the element [represents](http://www.w3.org/TR/html5/rendering.html#represents) its contents.

Otherwise, the user agent should instantiate a Java Language runtime [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin), and should pass the names and values of all the attributes on the element, in the order they were added to the element, with the attributes added by the parser being ordered in source order, and then a parameter named "PARAM" whose value is null, and then all the names and values of [parameters](http://www.w3.org/TR/html5/the-iframe-element.html#concept-param-parameter) given by [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) elements that are children of the [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element, in [tree order](http://www.w3.org/TR/html5/infrastructure.html#tree-order), to the [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) used. If the [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) supports a scriptable interface, the [HTMLAppletElement](http://www.w3.org/TR/html5/obsolete.html#htmlappletelement) object representing the element should expose that interface. The [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element [represents](http://www.w3.org/TR/html5/rendering.html#represents) the [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin).

The [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element is unaffected by the CSS 'display' property. The Java Language runtime is instantiated even if the element is hidden with a 'display:none' CSS style.

The [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element must implement the [HTMLAppletElement](http://www.w3.org/TR/html5/obsolete.html#htmlappletelement) interface.

interface HTMLAppletElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-applet-align);

attribute DOMString [alt](http://www.w3.org/TR/html5/obsolete.html#dom-applet-alt);

attribute DOMString [archive](http://www.w3.org/TR/html5/obsolete.html#dom-applet-archive);

attribute DOMString [code](http://www.w3.org/TR/html5/obsolete.html#dom-applet-code);

attribute DOMString [codeBase](http://www.w3.org/TR/html5/obsolete.html#dom-applet-codebase);

attribute DOMString [height](http://www.w3.org/TR/html5/obsolete.html#dom-applet-height);

attribute unsigned long [hspace](http://www.w3.org/TR/html5/obsolete.html#dom-applet-hspace);

attribute DOMString [name](http://www.w3.org/TR/html5/obsolete.html#dom-applet-name);

attribute DOMString \_[object](http://www.w3.org/TR/html5/obsolete.html#dom-applet-object); // the underscore is not part of the identifier

attribute unsigned long [vspace](http://www.w3.org/TR/html5/obsolete.html#dom-applet-vspace);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-applet-width);

};

The *align*, *alt*, *archive*, *code*, *height*, *hspace*, *name*, *object*, *vspace*, and *width* IDL attributes must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name. For the purposes of reflection, the [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) element's object content attribute is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

The *codeBase* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the codebase content attribute, which for the purposes of reflection is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

#### 11.3.2 The marquee element

The [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element is a presentational element that animates content. CSS transitions and animations are a more appropriate mechanism.

The [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) for tasks mentioned in this section is the [DOM manipulation task source](http://www.w3.org/TR/html5/webappapis.html#dom-manipulation-task-source).

The [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element must implement the [HTMLMarqueeElement](http://www.w3.org/TR/html5/obsolete.html#htmlmarqueeelement) interface.

interface HTMLMarqueeElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [behavior](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-behavior);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-bgcolor);

attribute DOMString [direction](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-direction);

attribute DOMString [height](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-height);

attribute unsigned long [hspace](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-hspace);

attribute long [loop](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-loop);

attribute unsigned long [scrollAmount](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-scrollamount);

attribute unsigned long [scrollDelay](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-scrolldelay);

attribute boolean [trueSpeed](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-truespeed);

attribute unsigned long [vspace](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-vspace);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-width);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onbounce](http://www.w3.org/TR/html5/obsolete.html#handler-marquee-onbounce);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onfinish](http://www.w3.org/TR/html5/obsolete.html#handler-marquee-onfinish);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onstart](http://www.w3.org/TR/html5/obsolete.html#handler-marquee-onstart);

void [start](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-start)();

void [stop](http://www.w3.org/TR/html5/obsolete.html#dom-marquee-stop)();

};

A [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element can be turned on or turned off. When it is created, it is [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on).

When the *start()* method is called, the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element must be [turned on](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-on).

When the *stop()* method is called, the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element must be [turned off](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-off).

When a [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element is created, the user agent must [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named start at the element.

The *behavior* content attribute on [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) elements is an [enumerated attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#enumerated-attribute) with the following keywords (all non-conforming):

| **Keyword** | **State** |
| --- | --- |
| scroll | scroll |
| slide | slide |
| alternate | alternate |

The *missing value default* is the [scroll](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior-scroll) state.

The *direction* content attribute on [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) elements is an [enumerated attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#enumerated-attribute) with the following keywords (all non-conforming):

| **Keyword** | **State** |
| --- | --- |
| left | left |
| right | right |
| up | up |
| down | down |

The *missing value default* is the [left](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-direction-left) state.

The *truespeed* content attribute on [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) elements is a [boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute).

A [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element has a marquee scroll interval, which is obtained as follows:

1. If the element has a scrolldelay attribute, and parsing its value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) does not return an error, then let delay be the parsed value. Otherwise, let delay be 85.
2. If the element does not have a [truespeed](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-truespeed) attribute, and the delay value is less than 60, then let delay be 60 instead.
3. The [marquee scroll interval](http://www.w3.org/TR/html5/obsolete.html#marquee-scroll-interval) is delay, interpreted in milliseconds.

A [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element has a marquee scroll distance, which, if the element has a scrollamount attribute, and parsing its value using the [rules for parsing non-negative integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-non-negative-integers) does not return an error, is the parsed value interpreted in CSS pixels, and otherwise is 6 CSS pixels.

A [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element has a marquee loop count, which, if the element has a loop attribute, and parsing its value using the [rules for parsing integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#rules-for-parsing-integers) does not return an error or a number less than 1, is the parsed value, and otherwise is −1.

The *loop* IDL attribute, on getting, must return the element's [marquee loop count](http://www.w3.org/TR/html5/obsolete.html#marquee-loop-count); and on setting, if the new value is different than the element's [marquee loop count](http://www.w3.org/TR/html5/obsolete.html#marquee-loop-count) and either greater than zero or equal to −1, must set the element's loop content attribute (adding it if necessary) to the [valid integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-integer) that represents the new value. (Other values are ignored.)

A [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element also has a marquee current loop index, which is zero when the element is created.

The rendering layer will occasionally increment the marquee current loop index, which must cause the following steps to be run:

1. If the [marquee loop count](http://www.w3.org/TR/html5/obsolete.html#marquee-loop-count) is −1, then abort these steps.
2. Increment the [marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#marquee-current-loop-index) by one.
3. If the [marquee current loop index](http://www.w3.org/TR/html5/obsolete.html#marquee-current-loop-index) is now equal to or greater than the element's [marquee loop count](http://www.w3.org/TR/html5/obsolete.html#marquee-loop-count), [turn off](http://www.w3.org/TR/html5/obsolete.html#concept-marquee-off) the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element and [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named finish at the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element.

Otherwise, if the [behavior](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior) attribute is in the [alternate](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-behavior-alternate) state, then [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named bounce at the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element.

Otherwise, [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named start at the [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) element.

The following are the [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) (and their corresponding [event handler event types](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type)) that must be supported, as content and IDL attributes, by [marquee](http://www.w3.org/TR/html5/obsolete.html#the-marquee-element) elements:

| [**Event handler**](http://www.w3.org/TR/html5/webappapis.html#event-handlers) | [**Event handler event type**](http://www.w3.org/TR/html5/webappapis.html#event-handler-event-type) |
| --- | --- |
| *onbounce* | bounce |
| *onfinish* | finish |
| *onstart* | start |

The *behavior*, *direction*, *height*, *hspace*, *vspace*, and *width* IDL attributes must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *bgColor* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the bgcolor content attribute.

The *scrollAmount* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the scrollamount content attribute. The default value is 6.

The *scrollDelay* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the scrolldelay content attribute. The default value is 85.

The *trueSpeed* IDL attribute must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the [truespeed](http://www.w3.org/TR/html5/obsolete.html#attr-marquee-truespeed) content attribute.

#### 11.3.3 Frames

The *frameset* element acts as [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) in documents that use frames.

The [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element must implement the [HTMLFrameSetElement](http://www.w3.org/TR/html5/obsolete.html#htmlframesetelement) interface.

interface HTMLFrameSetElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [cols](http://www.w3.org/TR/html5/obsolete.html#dom-frameset-cols);

attribute DOMString [rows](http://www.w3.org/TR/html5/obsolete.html#dom-frameset-rows);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onafterprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onafterprint);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onbeforeprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeprint);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onbeforeunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeunload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onhashchange](http://www.w3.org/TR/html5/webappapis.html#handler-window-onhashchange);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onmessage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onmessage);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onoffline](http://www.w3.org/TR/html5/webappapis.html#handler-window-onoffline);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [ononline](http://www.w3.org/TR/html5/webappapis.html#handler-window-ononline);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpagehide](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpagehide);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpageshow](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpageshow);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onpopstate](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpopstate);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onredo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onredo);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onresize](http://www.w3.org/TR/html5/webappapis.html#handler-window-onresize);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-window-onscroll);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onstorage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onstorage);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onundo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onundo);

attribute [Function](http://www.w3.org/TR/html5/webappapis.html#function) [onunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onunload);

};

The *cols* and *rows* IDL attributes of the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element must support the following [event handler content attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) exposing the [event handlers](http://www.w3.org/TR/html5/webappapis.html#event-handlers) of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object:

* [onafterprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onafterprint)
* [onbeforeprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeprint)
* [onbeforeunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeunload)
* [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur)
* [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror)
* [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus)
* [onhashchange](http://www.w3.org/TR/html5/webappapis.html#handler-window-onhashchange)
* [onload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload)
* [onmessage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onmessage)
* [onoffline](http://www.w3.org/TR/html5/webappapis.html#handler-window-onoffline)
* [ononline](http://www.w3.org/TR/html5/webappapis.html#handler-window-ononline)
* [onpagehide](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpagehide)
* [onpageshow](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpageshow)
* [onpopstate](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpopstate)
* [onredo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onredo)
* [onresize](http://www.w3.org/TR/html5/webappapis.html#handler-window-onresize)
* [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-window-onscroll)
* [onstorage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onstorage)
* [onundo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onundo)
* [onunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onunload)

The DOM interface also exposes [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes) that mirror those on the [Window](http://www.w3.org/TR/html5/browsers.html#window) element.

The [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur), [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror), [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus), [onload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload), and [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-window-onscroll) [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes) of the [Window](http://www.w3.org/TR/html5/browsers.html#window) object, exposed on the [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, shadow the generic [event handler IDL attributes](http://www.w3.org/TR/html5/webappapis.html#event-handler-idl-attributes) with the same names normally supported by [HTML elements](http://www.w3.org/TR/html5/infrastructure.html#html-elements).

The *frame* element defines a [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) similar to the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element, but rendered within a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element.

When the browsing context is created, if a src attribute is present, the user agent must [resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the value of that attribute, relative to the element, and if that is successful, must then [navigate](http://www.w3.org/TR/html5/history.html#navigate) the element's browsing context to the resulting [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url), with [replacement enabled](http://www.w3.org/TR/html5/history.html#replacement-enabled), and with the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element's document's [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) as the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context).

Whenever the src attribute is set, the user agent must [resolve](http://www.w3.org/TR/html5/urls.html#resolve-a-url) the value of that attribute, relative to the element, and if that is successful, the nested [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) must be [navigated](http://www.w3.org/TR/html5/history.html#navigate) to the resulting [absolute URL](http://www.w3.org/TR/html5/urls.html#absolute-url), with the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element's document's [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) as the [source browsing context](http://www.w3.org/TR/html5/history.html#source-browsing-context).

When the browsing context is created, if a name attribute is present, the [browsing context name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) must be set to the value of this attribute; otherwise, the [browsing context name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) must be set to the empty string.

Whenever the name attribute is set, the nested [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) must be changed to the new value. If the attribute is removed, the [browsing context name](http://www.w3.org/TR/html5/browsers.html#browsing-context-name) must be set to the empty string.

When content loads in a [frame](http://www.w3.org/TR/html5/obsolete.html#frame), after any load events are fired within the content itself, the user agent must [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named load at the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element. When content fails to load (e.g. due to a network error), then the user agent must [queue a task](http://www.w3.org/TR/html5/webappapis.html#queue-a-task) to [fire a simple event](http://www.w3.org/TR/html5/webappapis.html#fire-a-simple-event) named error at the element instead.

The [task source](http://www.w3.org/TR/html5/webappapis.html#task-source) for the [tasks](http://www.w3.org/TR/html5/webappapis.html#concept-task) above is the [DOM manipulation task source](http://www.w3.org/TR/html5/webappapis.html#dom-manipulation-task-source).

When there is an [active parser](http://www.w3.org/TR/html5/dom.html#active-parser) in the [frame](http://www.w3.org/TR/html5/obsolete.html#frame), and when anything in the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) is [delaying the load event](http://www.w3.org/TR/html5/the-end.html#delay-the-load-event) of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame)'s [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context)'s [active document](http://www.w3.org/TR/html5/browsers.html#active-document), the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) must [delay the load event](http://www.w3.org/TR/html5/the-end.html#delay-the-load-event) of its document.

The [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must implement the [HTMLFrameElement](http://www.w3.org/TR/html5/obsolete.html#htmlframeelement) interface.

interface HTMLFrameElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [frameBorder](http://www.w3.org/TR/html5/obsolete.html#dom-frame-frameborder);

attribute DOMString [longDesc](http://www.w3.org/TR/html5/obsolete.html#dom-frame-longdesc);

attribute DOMString [marginHeight](http://www.w3.org/TR/html5/obsolete.html#dom-frame-marginheight);

attribute DOMString [marginWidth](http://www.w3.org/TR/html5/obsolete.html#dom-frame-marginwidth);

attribute DOMString [name](http://www.w3.org/TR/html5/obsolete.html#dom-frame-name);

attribute boolean [noResize](http://www.w3.org/TR/html5/obsolete.html#dom-frame-noresize);

attribute DOMString [scrolling](http://www.w3.org/TR/html5/obsolete.html#dom-frame-scrolling);

attribute DOMString [src](http://www.w3.org/TR/html5/obsolete.html#dom-frame-src);

readonly attribute Document [contentDocument](http://www.w3.org/TR/html5/obsolete.html#dom-frame-contentdocument);

readonly attribute [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) [contentWindow](http://www.w3.org/TR/html5/obsolete.html#dom-frame-contentwindow);

};

The *name*, *scrolling*, and *src* IDL attributes of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *frameBorder* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's frameborder content attribute.

The *longDesc* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's longdesc content attribute, which for the purposes of reflection is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

The *marginHeight* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's marginheight content attribute.

The *marginWidth* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's marginwidth content attribute.

The *noResize* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's noresize content attribute.

The *contentDocument* IDL attribute of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element must return the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object of the [active document](http://www.w3.org/TR/html5/browsers.html#active-document) of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element's [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context).

The *contentWindow* IDL attribute must return the [WindowProxy](http://www.w3.org/TR/html5/browsers.html#windowproxy) object of the [frame](http://www.w3.org/TR/html5/obsolete.html#frame) element's [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context).

#### 11.3.4 Other elements, attributes and APIs

User agents must treat [acronym](http://www.w3.org/TR/html5/obsolete.html#acronym) elements in a manner equivalent to [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element) elements in terms of semantics and for purposes of rendering.

[Supplemental]

interface [HTMLAnchorElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlanchorelement) {

attribute DOMString [coords](http://www.w3.org/TR/html5/obsolete.html#dom-a-coords);

attribute DOMString [charset](http://www.w3.org/TR/html5/obsolete.html#dom-a-charset);

attribute DOMString [name](http://www.w3.org/TR/html5/obsolete.html#dom-a-name);

attribute DOMString [rev](http://www.w3.org/TR/html5/obsolete.html#dom-a-rev);

attribute DOMString [shape](http://www.w3.org/TR/html5/obsolete.html#dom-a-shape);

};

The *coords*, *charset*, *name*, *rev*, and *shape* IDL attributes of the [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

[Supplemental]

interface [HTMLAreaElement](http://www.w3.org/TR/html5/the-map-element.html#htmlareaelement) {

attribute boolean [noHref](http://www.w3.org/TR/html5/obsolete.html#dom-area-nohref);

};

The *noHref* IDL attribute of the [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [nohref](http://www.w3.org/TR/html5/obsolete.html#attr-area-nohref) content attribute.

The [basefont](http://www.w3.org/TR/html5/obsolete.html#basefont) element must implement the [HTMLBaseFontElement](http://www.w3.org/TR/html5/obsolete.html#htmlbasefontelement) interface.

interface HTMLBaseFontElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [color](http://www.w3.org/TR/html5/obsolete.html#dom-basefont-color);

attribute DOMString [face](http://www.w3.org/TR/html5/obsolete.html#dom-basefont-face);

attribute long [size](http://www.w3.org/TR/html5/obsolete.html#dom-basefont-size);

};

The *color*, *face*, and *size* IDL attributes of the [basefont](http://www.w3.org/TR/html5/obsolete.html#basefont) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

[Supplemental]

interface [HTMLBodyElement](http://www.w3.org/TR/html5/sections.html#htmlbodyelement) {

attribute DOMString [text](http://www.w3.org/TR/html5/obsolete.html#dom-body-text);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-body-bgcolor);

attribute DOMString [background](http://www.w3.org/TR/html5/obsolete.html#dom-body-background);

attribute DOMString [link](http://www.w3.org/TR/html5/obsolete.html#dom-body-link);

attribute DOMString [vLink](http://www.w3.org/TR/html5/obsolete.html#dom-body-vlink);

attribute DOMString [aLink](http://www.w3.org/TR/html5/obsolete.html#dom-body-alink);

};

The *text* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [text](http://www.w3.org/TR/html5/obsolete.html#attr-body-text) content attribute.

The *bgColor* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [bgcolor](http://www.w3.org/TR/html5/obsolete.html#attr-body-bgcolor) content attribute.

The *background* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [background](http://www.w3.org/TR/html5/obsolete.html#attr-background) content attribute. (The [background](http://www.w3.org/TR/html5/obsolete.html#attr-background) content is not defined to contain a [URL](http://www.w3.org/TR/html5/urls.html#url), despite rules regarding its handling in the rendering section above.)

The *link* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [link](http://www.w3.org/TR/html5/obsolete.html#attr-body-link) content attribute.

The *aLink* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [alink](http://www.w3.org/TR/html5/obsolete.html#attr-body-alink) content attribute.

The *vLink* IDL attribute of the [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [vlink](http://www.w3.org/TR/html5/obsolete.html#attr-body-vlink) content attribute.

[Supplemental]

interface [HTMLBRElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlbrelement) {

attribute DOMString [clear](http://www.w3.org/TR/html5/obsolete.html#dom-br-clear);

};

The *clear* IDL attribute of the [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLTableCaptionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecaptionelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-caption-align);

};

The *align* IDL attribute of the [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLTableColElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecolelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-col-align);

attribute DOMString [ch](http://www.w3.org/TR/html5/obsolete.html#dom-col-ch);

attribute DOMString [chOff](http://www.w3.org/TR/html5/obsolete.html#dom-col-choff);

attribute DOMString [vAlign](http://www.w3.org/TR/html5/obsolete.html#dom-col-valign);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-col-width);

};

The *align* and *width* IDL attributes of the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *ch* IDL attribute of the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [char](http://www.w3.org/TR/html5/obsolete.html#attr-col-char) content attribute.

The *chOff* IDL attribute of the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [charoff](http://www.w3.org/TR/html5/obsolete.html#attr-col-charoff) content attribute.

The *vAlign* IDL attribute of the [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [valign](http://www.w3.org/TR/html5/obsolete.html#attr-col-valign) content attribute.

User agents must treat [dir](http://www.w3.org/TR/html5/obsolete.html#dir) elements in a manner equivalent to [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) elements in terms of semantics and for purposes of rendering.

The [dir](http://www.w3.org/TR/html5/obsolete.html#dir) element must implement the [HTMLDirectoryElement](http://www.w3.org/TR/html5/obsolete.html#htmldirectoryelement) interface.

interface HTMLDirectoryElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute boolean [compact](http://www.w3.org/TR/html5/obsolete.html#dom-dir-compact);

};

The *compact* IDL attribute of the [dir](http://www.w3.org/TR/html5/obsolete.html#dir) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLDivElement](http://www.w3.org/TR/html5/grouping-content.html#htmldivelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-div-align);

};

The *align* IDL attribute of the [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLDListElement](http://www.w3.org/TR/html5/grouping-content.html#htmldlistelement) {

attribute boolean [compact](http://www.w3.org/TR/html5/obsolete.html#dom-dl-compact);

};

The *compact* IDL attribute of the [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLEmbedElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlembedelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-embed-align);

attribute DOMString [name](http://www.w3.org/TR/html5/obsolete.html#dom-embed-name);

};

The *name* and *align* IDL attributes of the [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The [font](http://www.w3.org/TR/html5/obsolete.html#font) element must implement the [HTMLFontElement](http://www.w3.org/TR/html5/obsolete.html#htmlfontelement) interface.

interface HTMLFontElement : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) {

attribute DOMString [color](http://www.w3.org/TR/html5/obsolete.html#dom-font-color);

attribute DOMString [face](http://www.w3.org/TR/html5/obsolete.html#dom-font-face);

attribute DOMString [size](http://www.w3.org/TR/html5/obsolete.html#dom-font-size);

};

The *color*, *face*, and *size* IDL attributes of the [font](http://www.w3.org/TR/html5/obsolete.html#font) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

[Supplemental]

interface [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-hx-align);

};

The *align* IDL attribute of the [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)–[h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

The *profile* IDL attribute on [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) elements (with the [HTMLHeadElement](http://www.w3.org/TR/html5/semantics.html#htmlheadelement) interface) is intentionally omitted. Unless so required by [another applicable specification](http://www.w3.org/TR/html5/infrastructure.html#other-applicable-specifications), implementations would therefore not support this attribute. (It is mentioned here as it was defined in a previous version of the DOM specifications.)

[Supplemental]

interface [HTMLHRElement](http://www.w3.org/TR/html5/grouping-content.html#htmlhrelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-hr-align);

attribute DOMString [color](http://www.w3.org/TR/html5/obsolete.html#dom-hr-color);

attribute boolean [noShade](http://www.w3.org/TR/html5/obsolete.html#dom-hr-noshade);

attribute DOMString [size](http://www.w3.org/TR/html5/obsolete.html#dom-hr-size);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-hr-width);

};

The *align*, *color*, *size*, and *width* IDL attributes of the [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *noShade* IDL attribute of the [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's noshade content attribute.

[Supplemental]

interface [HTMLHtmlElement](http://www.w3.org/TR/html5/semantics.html#htmlhtmlelement) {

attribute DOMString [version](http://www.w3.org/TR/html5/obsolete.html#dom-html-version);

};

The *version* IDL attribute of the [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLIFrameElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmliframeelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-align);

attribute DOMString [frameBorder](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-frameborder);

attribute DOMString [longDesc](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-longdesc);

attribute DOMString [marginHeight](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-marginheight);

attribute DOMString [marginWidth](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-marginwidth);

attribute DOMString [scrolling](http://www.w3.org/TR/html5/obsolete.html#dom-iframe-scrolling);

};

The *align* and *scrolling* IDL attributes of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *frameBorder* IDL attribute of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [frameborder](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-frameborder) content attribute.

The *longDesc* IDL attribute of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [longdesc](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-longdesc) content attribute, which for the purposes of reflection is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

The *marginHeight* IDL attribute of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [marginheight](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginheight) content attribute.

The *marginWidth* IDL attribute of the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [marginwidth](http://www.w3.org/TR/html5/obsolete.html#attr-iframe-marginwidth) content attribute.

[Supplemental]

interface [HTMLImageElement](http://www.w3.org/TR/html5/embedded-content-1.html#htmlimageelement) {

attribute DOMString [name](http://www.w3.org/TR/html5/obsolete.html#dom-img-name);

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-img-align);

attribute DOMString [border](http://www.w3.org/TR/html5/obsolete.html#dom-img-border);

attribute unsigned long [hspace](http://www.w3.org/TR/html5/obsolete.html#dom-img-hspace);

attribute DOMString [longDesc](http://www.w3.org/TR/html5/obsolete.html#dom-img-longdesc);

attribute unsigned long [vspace](http://www.w3.org/TR/html5/obsolete.html#dom-img-vspace);

};

The *name*, *align*, *border*, *hspace*, and *vspace* IDL attributes of the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *longDesc* IDL attribute of the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [longdesc](http://www.w3.org/TR/html5/obsolete.html#attr-img-longdesc) content attribute, which for the purposes of reflection is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

[Supplemental]

interface [HTMLInputElement](http://www.w3.org/TR/html5/the-input-element.html#htmlinputelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-input-align);

attribute DOMString [useMap](http://www.w3.org/TR/html5/obsolete.html#dom-input-usemap);

};

The *align* IDL attribute of the [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

The *useMap* IDL attribute of the [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [usemap](http://www.w3.org/TR/html5/obsolete.html#attr-input-usemap) content attribute.

[Supplemental]

interface [HTMLLegendElement](http://www.w3.org/TR/html5/forms.html#htmllegendelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-legend-align);

};

The *align* IDL attribute of the [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLLIElement](http://www.w3.org/TR/html5/grouping-content.html#htmllielement) {

attribute DOMString [type](http://www.w3.org/TR/html5/obsolete.html#dom-li-type);

};

The *type* IDL attribute of the [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLLinkElement](http://www.w3.org/TR/html5/semantics.html#htmllinkelement) {

attribute DOMString [charset](http://www.w3.org/TR/html5/obsolete.html#dom-link-charset);

attribute DOMString [rev](http://www.w3.org/TR/html5/obsolete.html#dom-link-rev);

attribute DOMString [target](http://www.w3.org/TR/html5/obsolete.html#dom-link-target);

};

The *charset*, *rev*, and *target* IDL attributes of the [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

User agents must treat [listing](http://www.w3.org/TR/html5/obsolete.html#listing) elements in a manner equivalent to [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) elements in terms of semantics and for purposes of rendering.

[Supplemental]

interface [HTMLMenuElement](http://www.w3.org/TR/html5/interactive-elements.html#htmlmenuelement) {

attribute boolean [compact](http://www.w3.org/TR/html5/obsolete.html#dom-menu-compact);

};

The *compact* IDL attribute of the [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLMetaElement](http://www.w3.org/TR/html5/semantics.html#htmlmetaelement) {

attribute DOMString [scheme](http://www.w3.org/TR/html5/obsolete.html#dom-meta-scheme);

};

User agents may treat the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) content attribute on the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element as an extension of the element's [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) content attribute when processing a [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element with a [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute whose value is one that the user agent recognizes as supporting the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) attribute.

User agents are encouraged to ignore the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) attribute and instead process the value given to the metadata name as if it had been specified for each expected value of the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) attribute.

For example, if the user agent acts on [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements with [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attributes having the value "eGMS.subject.keyword", and knows that the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) attribute is used with this metadata name, then it could take the [scheme](http://www.w3.org/TR/html5/obsolete.html#attr-meta-scheme) attribute into account, acting as if it was an extension of the [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) attribute. Thus the following two [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) elements could be treated as two elements giving values for two different metadata names, one consisting of a combination of "eGMS.subject.keyword" and "LGCL", and the other consisting of a combination of "eGMS.subject.keyword" and "ORLY":

<!-- this markup is invalid -->

<meta name="eGMS.subject.keyword" scheme="LGCL" content="Abandoned vehicles">

<meta name="eGMS.subject.keyword" scheme="ORLY" content="Mah car: kthxbye">

The recommended processing of this markup, however, would be equivalent to the following:

<meta name="eGMS.subject.keyword" content="Abandoned vehicles">

<meta name="eGMS.subject.keyword" content="Mah car: kthxbye">

The *scheme* IDL attribute of the [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLObjectElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlobjectelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-object-align);

attribute DOMString [archive](http://www.w3.org/TR/html5/obsolete.html#dom-object-archive);

attribute DOMString [border](http://www.w3.org/TR/html5/obsolete.html#dom-object-border);

attribute DOMString [code](http://www.w3.org/TR/html5/obsolete.html#dom-object-code);

attribute DOMString [codeBase](http://www.w3.org/TR/html5/obsolete.html#dom-object-codebase);

attribute DOMString [codeType](http://www.w3.org/TR/html5/obsolete.html#dom-object-codetype);

attribute boolean [declare](http://www.w3.org/TR/html5/obsolete.html#dom-object-declare);

attribute unsigned long [hspace](http://www.w3.org/TR/html5/obsolete.html#dom-object-hspace);

attribute DOMString [standby](http://www.w3.org/TR/html5/obsolete.html#dom-object-standby);

attribute unsigned long [vspace](http://www.w3.org/TR/html5/obsolete.html#dom-object-vspace);

};

The *align*, *archive*, *border*, *code*, *declare*, *hspace*, *standby*, and *vspace* IDL attributes of the [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *codeBase* IDL attribute of the [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [codebase](http://www.w3.org/TR/html5/obsolete.html#attr-object-codebase) content attribute, which for the purposes of reflection is defined as containing a [URL](http://www.w3.org/TR/html5/urls.html#url).

The *codeType* IDL attribute of the [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [codetype](http://www.w3.org/TR/html5/obsolete.html#attr-object-codetype) content attribute.

[Supplemental]

interface [HTMLOListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlolistelement) {

attribute boolean [compact](http://www.w3.org/TR/html5/obsolete.html#dom-ol-compact);

};

The *compact* IDL attribute of the [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLParagraphElement](http://www.w3.org/TR/html5/grouping-content.html#htmlparagraphelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-p-align);

};

The *align* IDL attribute of the [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLParamElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlparamelement) {

attribute DOMString [type](http://www.w3.org/TR/html5/obsolete.html#dom-param-type);

attribute DOMString [valueType](http://www.w3.org/TR/html5/obsolete.html#dom-param-valuetype);

};

The *type* IDL attribute of the [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

The *valueType* IDL attribute of the [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [valuetype](http://www.w3.org/TR/html5/obsolete.html#attr-param-valuetype) content attribute.

User agents must treat [plaintext](http://www.w3.org/TR/html5/obsolete.html#plaintext) elements in a manner equivalent to [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) elements in terms of semantics and for purposes of rendering. (The parser has special behavior for this element, though.)

[Supplemental]

interface [HTMLPreElement](http://www.w3.org/TR/html5/grouping-content.html#htmlpreelement) {

attribute unsigned long [width](http://www.w3.org/TR/html5/obsolete.html#dom-pre-width);

};

The *width* IDL attribute of the [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

[Supplemental]

interface [HTMLScriptElement](http://www.w3.org/TR/html5/scripting-1.html#htmlscriptelement) {

attribute DOMString [event](http://www.w3.org/TR/html5/obsolete.html#dom-script-event);

attribute DOMString [htmlFor](http://www.w3.org/TR/html5/obsolete.html#dom-script-htmlfor);

};

The *event* and *htmlFor* IDL attributes of the [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) element must return the empty string on getting, and do nothing on setting.

[Supplemental]

interface [HTMLTableElement](http://www.w3.org/TR/html5/tabular-data.html#htmltableelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-table-align);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-table-bgcolor);

attribute DOMString [cellPadding](http://www.w3.org/TR/html5/obsolete.html#dom-table-cellpadding);

attribute DOMString [cellSpacing](http://www.w3.org/TR/html5/obsolete.html#dom-table-cellspacing);

attribute DOMString [frame](http://www.w3.org/TR/html5/obsolete.html#dom-table-frame);

attribute DOMString [rules](http://www.w3.org/TR/html5/obsolete.html#dom-table-rules);

attribute DOMString [summary](http://www.w3.org/TR/html5/obsolete.html#dom-table-summary);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-table-width);

};

The *align*, *frame*, *summary*, *rules*, and *width*, IDL attributes of the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *bgColor* IDL attribute of the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [bgcolor](http://www.w3.org/TR/html5/obsolete.html#attr-table-bgcolor) content attribute.

The *cellPadding* IDL attribute of the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [cellpadding](http://www.w3.org/TR/html5/obsolete.html#attr-table-cellpadding) content attribute.

The *cellSpacing* IDL attribute of the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [cellspacing](http://www.w3.org/TR/html5/obsolete.html#attr-table-cellspacing) content attribute.

[Supplemental]

interface [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-tbody-align);

attribute DOMString [ch](http://www.w3.org/TR/html5/obsolete.html#dom-tbody-ch);

attribute DOMString [chOff](http://www.w3.org/TR/html5/obsolete.html#dom-tbody-choff);

attribute DOMString [vAlign](http://www.w3.org/TR/html5/obsolete.html#dom-tbody-valign);

};

The *align* IDL attribute of the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

The *ch* IDL attribute of the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [char](http://www.w3.org/TR/html5/obsolete.html#attr-tbody-char) content attributes.

The *chOff* IDL attribute of the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [charoff](http://www.w3.org/TR/html5/obsolete.html#attr-tbody-charoff) content attributes.

The *vAlign* IDL attribute of the [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element), [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element), and [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [valign](http://www.w3.org/TR/html5/obsolete.html#attr-tbody-valign) content attributes.

[Supplemental]

interface [HTMLTableCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecellelement) {

attribute DOMString [abbr](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-abbr);

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-align);

attribute DOMString [axis](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-axis);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-bgcolor);

attribute DOMString [ch](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-ch);

attribute DOMString [chOff](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-choff);

attribute DOMString [height](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-height);

attribute boolean [noWrap](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-nowrap);

attribute DOMString [vAlign](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-valign);

attribute DOMString [width](http://www.w3.org/TR/html5/obsolete.html#dom-tdth-width);

};

The *abbr*, *align*, *axis*, *height*, and *width* IDL attributes of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

The *bgColor* IDL attribute of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [bgcolor](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-bgcolor) content attributes.

The *ch* IDL attribute of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [char](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-char) content attributes.

The *chOff* IDL attribute of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [charoff](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-charoff) content attributes.

The *noWrap* IDL attribute of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) elements must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [nowrap](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-nowrap) content attributes.

The *vAlign* IDL attribute of the [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) and [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the elements' [valign](http://www.w3.org/TR/html5/obsolete.html#attr-tdth-valign) content attributes.

[Supplemental]

interface [HTMLTableRowElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablerowelement) {

attribute DOMString [align](http://www.w3.org/TR/html5/obsolete.html#dom-tr-align);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-tr-bgcolor);

attribute DOMString [ch](http://www.w3.org/TR/html5/obsolete.html#dom-tr-ch);

attribute DOMString [chOff](http://www.w3.org/TR/html5/obsolete.html#dom-tr-choff);

attribute DOMString [vAlign](http://www.w3.org/TR/html5/obsolete.html#dom-tr-valign);

};

The *align* IDL attribute of the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute of the same name.

The *bgColor* IDL attribute of the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [bgcolor](http://www.w3.org/TR/html5/obsolete.html#attr-tr-bgcolor) content attribute.

The *ch* IDL attribute of the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [char](http://www.w3.org/TR/html5/obsolete.html#attr-tr-char) content attribute.

The *chOff* IDL attribute of the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [charoff](http://www.w3.org/TR/html5/obsolete.html#attr-tr-charoff) content attribute.

The *vAlign* IDL attribute of the [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the element's [valign](http://www.w3.org/TR/html5/obsolete.html#attr-tr-valign) content attribute.

[Supplemental]

interface [HTMLUListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlulistelement) {

attribute boolean [compact](http://www.w3.org/TR/html5/obsolete.html#dom-ul-compact);

attribute DOMString [type](http://www.w3.org/TR/html5/obsolete.html#dom-ul-type);

};

The *compact* and *type* IDL attributes of the [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) element must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the respective content attributes of the same name.

User agents must treat [xmp](http://www.w3.org/TR/html5/obsolete.html#xmp) elements in a manner equivalent to [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) elements in terms of semantics and for purposes of rendering. (The parser has special behavior for this element though.)

The [bgsound](http://www.w3.org/TR/html5/obsolete.html#bgsound), [isindex](http://www.w3.org/TR/html5/obsolete.html#isindex-0), [multicol](http://www.w3.org/TR/html5/obsolete.html#multicol), [nextid](http://www.w3.org/TR/html5/obsolete.html#nextid), [rb](http://www.w3.org/TR/html5/obsolete.html#rb), and [spacer](http://www.w3.org/TR/html5/obsolete.html#spacer) elements must use the [HTMLUnknownElement](http://www.w3.org/TR/html5/elements.html#htmlunknownelement) interface.

[Supplemental]

interface [HTMLDocument](http://www.w3.org/TR/html5/dom.html#htmldocument) {

attribute DOMString [fgColor](http://www.w3.org/TR/html5/obsolete.html#dom-document-fgcolor);

attribute DOMString [bgColor](http://www.w3.org/TR/html5/obsolete.html#dom-document-bgcolor);

attribute DOMString [linkColor](http://www.w3.org/TR/html5/obsolete.html#dom-document-linkcolor);

attribute DOMString [vlinkColor](http://www.w3.org/TR/html5/obsolete.html#dom-document-vlinkcolor);

attribute DOMString [alinkColor](http://www.w3.org/TR/html5/obsolete.html#dom-document-alinkcolor);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [anchors](http://www.w3.org/TR/html5/obsolete.html#dom-document-anchors);

readonly attribute [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) [applets](http://www.w3.org/TR/html5/obsolete.html#dom-document-applets);

void [clear](http://www.w3.org/TR/html5/obsolete.html#dom-document-clear)();

readonly attribute [HTMLAllCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlallcollection) [all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all);

};

The attributes of the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) object listed in the first column of the following table must [reflect](http://www.w3.org/TR/html5/common-dom-interfaces.html#reflect) the content attribute on [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) with the name given in the corresponding cell in the second column on the same row, if [the body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) is a [body](http://www.w3.org/TR/html5/sections.html#the-body-element) element (as opposed to a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element). When there is no [body element](http://www.w3.org/TR/html5/dom.html#the-body-element-0) or if it is a [frameset](http://www.w3.org/TR/html5/obsolete.html#frameset) element, the attributes must instead return the empty string on getting and do nothing on setting.

| **IDL attribute** | **Content attribute** |
| --- | --- |
| *fgColor* | [text](http://www.w3.org/TR/html5/obsolete.html#attr-body-text) |
| *bgColor* | [bgcolor](http://www.w3.org/TR/html5/obsolete.html#attr-body-bgcolor) |
| *linkColor* | [link](http://www.w3.org/TR/html5/obsolete.html#attr-body-link) |
| *vlinkColor* | [vlink](http://www.w3.org/TR/html5/obsolete.html#attr-body-vlink) |
| *alinkColor* | [alink](http://www.w3.org/TR/html5/obsolete.html#attr-body-alink) |

The *anchors* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) elements with [name](http://www.w3.org/TR/html5/obsolete.html#attr-a-name) attributes.

The *applets* attribute must return an [HTMLCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches only [applet](http://www.w3.org/TR/html5/obsolete.html#the-applet-element) elements.

The *clear()* method must do nothing.

The *all* attribute must return an [HTMLAllCollection](http://www.w3.org/TR/html5/common-dom-interfaces.html#htmlallcollection) rooted at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) node, whose filter matches all elements.

The object returned for [all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all) has several unusual behaviors:

* The user agent must act as if the ToBoolean() operator in JavaScript converts the object returned for [all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all) to the false value.
* The user agent must act as if, for the purposes of the == and != operators in JavaScript, the object returned for [all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all) is equal to the undefined value.
* The user agent must act such that the typeof operator in JavaScript returns the string undefined when applied to the object returned for [all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all).

These requirements are a [willful violation](http://www.w3.org/TR/html5/introduction.html#willful-violation) of the JavaScript specification current at the time of writing (ECMAScript edition 3). The JavaScript specification requires that the ToBoolean() operator convert all objects to the true value, and does not have provisions for objects acting as if they were undefined for the purposes of certain operators. This violation is motivated by a desire for compatibility with two classes of legacy content: one that uses the presence of [document.all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all) as a way to detect legacy user agents, and one that only supports those legacy user agents and uses the [document.all](http://www.w3.org/TR/html5/obsolete.html#dom-document-all) object without testing for its presence first. [[ECMA262]](http://www.w3.org/TR/html5/references.html#refsECMA262)

## 12 IANA considerations

### 12.1 *text/html*

This registration is for community review and will be submitted to the IESG for review, approval, and registration with IANA.

Type name:

text

Subtype name:

html

Required parameters:

No required parameters

Optional parameters:

charset

The charset parameter may be provided to definitively specify the [document's character encoding](http://www.w3.org/TR/html5/dom.html#document-s-character-encoding), overriding any [character encoding declarations](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration) in the document. The parameter's value must be the name of the character encoding used to serialize the file, must be a valid character encoding name, and must be an [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive) match for the [preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) for that encoding. [[IANACHARSET]](http://www.w3.org/TR/html5/references.html#refsIANACHARSET)

Encoding considerations:

See the section on [character encoding declarations](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration).

Security considerations:

Entire novels have been written about the security considerations that apply to HTML documents. Many are listed in this document, to which the reader is referred for more details. Some general concerns bear mentioning here, however:

HTML is scripted language, and has a large number of APIs (some of which are described in this document). Script can expose the user to potential risks of information leakage, credential leakage, cross-site scripting attacks, cross-site request forgeries, and a host of other problems. While the designs in this specification are intended to be safe if implemented correctly, a full implementation is a massive undertaking and, as with any software, user agents are likely to have security bugs.

Even without scripting, there are specific features in HTML which, for historical reasons, are required for broad compatibility with legacy content but that expose the user to unfortunate security problems. In particular, the [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) element can be used in conjunction with some other features as a way to effect a port scan from the user's location on the Internet. This can expose local network topologies that the attacker would otherwise not be able to determine.

HTML relies on a compartmentalization scheme sometimes known as the *same-origin policy*. An [origin](http://www.w3.org/TR/html5/origin-0.html#origin) in most cases consists of all the pages served from the same host, on the same port, using the same protocol.

It is critical, therefore, to ensure that any untrusted content that forms part of a site be hosted on a different [origin](http://www.w3.org/TR/html5/origin-0.html#origin) than any sensitive content on that site. Untrusted content can easily spoof any other page on the same origin, read data from that origin, cause scripts in that origin to execute, submit forms to and from that origin even if they are protected from cross-site request forgery attacks by unique tokens, and make use of any third-party resources exposed to or rights granted to that origin.

Interoperability considerations:

Rules for processing both conforming and non-conforming content are defined in this specification.

Published specification:

This document is the relevant specification. Labeling a resource with the [text/html](http://www.w3.org/TR/html5/iana.html#text-html) type asserts that the resource is an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) using [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax).

Applications that use this media type:

Web browsers, tools for processing Web content, HTML authoring tools, search engines, validators.

Additional information:

Magic number(s):

No sequence of bytes can uniquely identify an HTML document. More information on detecting HTML documents is available in the Media Type Sniffing specification. [[MIMESNIFF]](http://www.w3.org/TR/html5/references.html#refsMIMESNIFF)

File extension(s):

"html" and "htm" are commonly, but certainly not exclusively, used as the extension for HTML documents.

Macintosh file type code(s):

TEXT

Person & email address to contact for further information:

Ian Hickson <ian@hixie.ch>

Intended usage:

Common

Restrictions on usage:

No restrictions apply.

Author:

Ian Hickson <ian@hixie.ch>

Change controller:

W3C

Fragment identifiers used with [text/html](http://www.w3.org/TR/html5/iana.html#text-html) resources refer to [the indicated part of the document](http://www.w3.org/TR/html5/history.html#the-indicated-part-of-the-document).

### 12.2 *text/html-sandboxed*

This registration is for community review and will be submitted to the IESG for review, approval, and registration with IANA.

Type name:

text

Subtype name:

html-sandboxed

Required parameters:

No required parameters

Optional parameters:

Same as for [text/html](http://www.w3.org/TR/html5/iana.html#text-html)

Encoding considerations:

Same as for [text/html](http://www.w3.org/TR/html5/iana.html#text-html)

Security considerations:

The purpose of the [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) MIME type is to provide a way for content providers to indicate that they want the file to be interpreted in a manner that does not give the file's contents access to the rest of the site. This is achieved by assigning the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) objects generated from resources labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) unique origins.

To avoid having legacy user agents treating resources labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) as regular [text/html](http://www.w3.org/TR/html5/iana.html#text-html) files, authors should avoid using the .html or .htm extensions for resources labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed).

Furthermore, since the [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) MIME type impacts the origin security model, authors should be careful to prevent tampering with the MIME type labeling mechanism itself when documents are labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed). If an attacker can cause a file to be served as [text/html](http://www.w3.org/TR/html5/iana.html#text-html) instead of [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed), then the sandboxing will not take effect and a cross-site scripting attack will become possible.

Beyond this, the type is identical to [text/html](http://www.w3.org/TR/html5/iana.html#text-html), and the same considerations apply.

Interoperability considerations:

Same as for [text/html](http://www.w3.org/TR/html5/iana.html#text-html)

Published specification:

This document is the relevant specification. Labeling a resource with the [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) type asserts that the resource is an [HTML document](http://www.w3.org/TR/html5/dom.html#html-documents) using [the HTML syntax](http://www.w3.org/TR/html5/syntax.html#syntax).

Applications that use this media type:

Same as for [text/html](http://www.w3.org/TR/html5/iana.html#text-html)

Additional information:

Magic number(s):

Documents labeled as [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) are heuristically indistinguishable from those labeled as [text/html](http://www.w3.org/TR/html5/iana.html#text-html).

File extension(s):

"sandboxed"

Macintosh file type code(s):

TEXT

Person & email address to contact for further information:

Ian Hickson <ian@hixie.ch>

Intended usage:

Common

Restrictions on usage:

No restrictions apply.

Author:

Ian Hickson <ian@hixie.ch>

Change controller:

W3C

Fragment identifiers used with [text/html-sandboxed](http://www.w3.org/TR/html5/iana.html#text-html-sandboxed) resources refer to [the indicated part of the document](http://www.w3.org/TR/html5/history.html#the-indicated-part-of-the-document).

### 12.3 *application/xhtml+xml*

This registration is for community review and will be submitted to the IESG for review, approval, and registration with IANA.

Type name:

application

Subtype name:

xhtml+xml

Required parameters:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Optional parameters:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Encoding considerations:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Security considerations:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Interoperability considerations:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Published specification:

Labeling a resource with the [application/xhtml+xml](http://www.w3.org/TR/html5/iana.html#application-xhtml-xml) type asserts that the resource is an XML document that likely has a root element from the [HTML namespace](http://www.w3.org/TR/html5/namespaces.html#html-namespace-0). As such, the relevant specifications are the XML specification, the Namespaces in XML specification, and this specification. [[XML]](http://www.w3.org/TR/html5/references.html#refsXML) [[XMLNS]](http://www.w3.org/TR/html5/references.html#refsXMLNS)

Applications that use this media type:

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

Additional information:

Magic number(s):

Same as for application/xml [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

File extension(s):

"xhtml" and "xht" are sometimes used as extensions for XML resources that have a root element from the [HTML namespace](http://www.w3.org/TR/html5/namespaces.html#html-namespace-0).

Macintosh file type code(s):

TEXT

Person & email address to contact for further information:

Ian Hickson <ian@hixie.ch>

Intended usage:

Common

Restrictions on usage:

No restrictions apply.

Author:

Ian Hickson <ian@hixie.ch>

Change controller:

W3C

Fragment identifiers used with [application/xhtml+xml](http://www.w3.org/TR/html5/iana.html#application-xhtml-xml) resources have the same semantics as with any [XML MIME type](http://www.w3.org/TR/html5/infrastructure.html#xml-mime-type). [[RFC3023]](http://www.w3.org/TR/html5/references.html#refsRFC3023)

### 12.4 *text/cache-manifest*

This registration is for community review and will be submitted to the IESG for review, approval, and registration with IANA.

Type name:

text

Subtype name:

cache-manifest

Required parameters:

No parameters

Optional parameters:

No parameters

Encoding considerations:

Always UTF-8.

Security considerations:

Cache manifests themselves pose no immediate risk unless sensitive information is included within the manifest. Implementations, however, are required to follow specific rules when populating a cache based on a cache manifest, to ensure that certain origin-based restrictions are honored. Failure to correctly implement these rules can result in information leakage, cross-site scripting attacks, and the like.

Interoperability considerations:

Rules for processing both conforming and non-conforming content are defined in this specification.

Published specification:

This document is the relevant specification.

Applications that use this media type:

Web browsers.

Additional information:

Magic number(s):

Cache manifests begin with the string "CACHE MANIFEST", followed by either a U+0020 SPACE character, a U+0009 CHARACTER TABULATION (tab) character, a U+000A LINE FEED (LF) character, or a U+000D CARRIAGE RETURN (CR) character.

File extension(s):

"appcache"

Macintosh file type code(s):

No specific Macintosh file type codes are recommended for this type.

Person & email address to contact for further information:

Ian Hickson <ian@hixie.ch>

Intended usage:

Common

Restrictions on usage:

No restrictions apply.

Author:

Ian Hickson <ian@hixie.ch>

Change controller:

W3C

Fragment identifiers have no meaning with [text/cache-manifest](http://www.w3.org/TR/html5/iana.html#text-cache-manifest) resources.

## Index

The following sections only cover conforming elements and features.

### Elements

*.*

| List of elements | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Element** | **Description** | **Categories** | **Parents†** | **Children** | **Attributes** | **Interface** |
| [**a**](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) | Hyperlink | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\*; [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [transparent](http://www.w3.org/TR/html5/content-models.html#transparent)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href); [target](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target); [rel](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel); [media](http://www.w3.org/TR/html5/links.html#attr-hyperlink-media); [hreflang](http://www.w3.org/TR/html5/links.html#attr-hyperlink-hreflang); [type](http://www.w3.org/TR/html5/links.html#attr-hyperlink-type) | [HTMLAnchorElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlanchorelement) |
| [**abbr**](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element) | Abbreviation | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**address**](http://www.w3.org/TR/html5/sections.html#the-address-element) | Contact information for a page or section | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**area**](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) | Hyperlink or dead area on an image map | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [alt](http://www.w3.org/TR/html5/the-map-element.html#attr-area-alt); [coords](http://www.w3.org/TR/html5/the-map-element.html#attr-area-coords); [shape](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape); [href](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href); [target](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target); [rel](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel); [media](http://www.w3.org/TR/html5/links.html#attr-hyperlink-media); [hreflang](http://www.w3.org/TR/html5/links.html#attr-hyperlink-hreflang); [type](http://www.w3.org/TR/html5/links.html#attr-hyperlink-type) | [HTMLAreaElement](http://www.w3.org/TR/html5/the-map-element.html#htmlareaelement) |
| [**article**](http://www.w3.org/TR/html5/sections.html#the-article-element) | Self-contained syndicatable or reusable composition | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning](http://www.w3.org/TR/html5/content-models.html#sectioning-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**aside**](http://www.w3.org/TR/html5/sections.html#the-aside-element) | Sidebar for tangentially related content | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning](http://www.w3.org/TR/html5/content-models.html#sectioning-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**audio**](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) | Audio player | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [source](http://www.w3.org/TR/html5/the-iframe-element.html#the-source-element)\*; [transparent](http://www.w3.org/TR/html5/content-models.html#transparent)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-src); [preload](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload); [autoplay](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-autoplay); [mediagroup](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-mediagroup); [loop](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-loop); [controls](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls) | [HTMLAudioElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlaudioelement) |
| [**b**](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element) | Keywords | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**base**](http://www.w3.org/TR/html5/semantics.html#the-base-element) | Base URL and default target [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for [hyperlinks](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target) and [forms](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-target) | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [href](http://www.w3.org/TR/html5/semantics.html#attr-base-href); [target](http://www.w3.org/TR/html5/semantics.html#attr-base-target) | [HTMLBaseElement](http://www.w3.org/TR/html5/semantics.html#htmlbaseelement) |
| [**bdi**](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdi-element) | Text directionality isolation | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**bdo**](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdo-element) | Text directionality formatting | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**blockquote**](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element) | A section quoted from another source | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [cite](http://www.w3.org/TR/html5/grouping-content.html#attr-blockquote-cite) | [HTMLQuoteElement](http://www.w3.org/TR/html5/grouping-content.html#htmlquoteelement) |
| [**body**](http://www.w3.org/TR/html5/sections.html#the-body-element) | Document body | [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root) | [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [onafterprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onafterprint); [onbeforeprint](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeprint); [onbeforeunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeunload); [onblur](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur); [onerror](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror); [onfocus](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus); [onhashchange](http://www.w3.org/TR/html5/webappapis.html#handler-window-onhashchange); [onload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload); [onmessage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onmessage); [onoffline](http://www.w3.org/TR/html5/webappapis.html#handler-window-onoffline); [ononline](http://www.w3.org/TR/html5/webappapis.html#handler-window-ononline); [onpagehide](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpagehide); [onpageshow](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpageshow); [onpopstate](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpopstate); [onredo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onredo); [onresize](http://www.w3.org/TR/html5/webappapis.html#handler-window-onresize); [onscroll](http://www.w3.org/TR/html5/webappapis.html#handler-window-onscroll); [onstorage](http://www.w3.org/TR/html5/webappapis.html#handler-window-onstorage); [onundo](http://www.w3.org/TR/html5/webappapis.html#handler-window-onundo); [onunload](http://www.w3.org/TR/html5/webappapis.html#handler-window-onunload) | [HTMLBodyElement](http://www.w3.org/TR/html5/sections.html#htmlbodyelement) |
| [**br**](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) | Line break, e.g. in poem or postal address | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLBRElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlbrelement) |
| [**button**](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) | Button control | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [autofocus](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [formaction](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formaction); [formenctype](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formenctype); [formmethod](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formmethod); [formnovalidate](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formnovalidate); [formtarget](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formtarget); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [type](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type); [value](http://www.w3.org/TR/html5/the-button-element.html#attr-button-value) | [HTMLButtonElement](http://www.w3.org/TR/html5/the-button-element.html#htmlbuttonelement) |
| [**canvas**](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) | Scriptable bitmap canvas | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [transparent](http://www.w3.org/TR/html5/content-models.html#transparent) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [width](http://www.w3.org/TR/html5/the-canvas-element.html#attr-canvas-width); [height](http://www.w3.org/TR/html5/the-canvas-element.html#attr-canvas-height) | [HTMLCanvasElement](http://www.w3.org/TR/html5/the-canvas-element.html#htmlcanvaselement) |
| [**caption**](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element) | Table caption | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTableCaptionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecaptionelement) |
| [**cite**](http://www.w3.org/TR/html5/text-level-semantics.html#the-cite-element) | Title of a work | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**code**](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element) | Computer code | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**col**](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) | Table column | none | [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [span](http://www.w3.org/TR/html5/tabular-data.html#attr-col-span) | [HTMLTableColElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecolelement) |
| [**colgroup**](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) | Group of columns in a table | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [span](http://www.w3.org/TR/html5/tabular-data.html#attr-colgroup-span) | [HTMLTableColElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecolelement) |
| [**command**](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element) | Menu command | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [type](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-type); [label](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-label); [icon](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-icon); [disabled](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-disabled); [checked](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-checked); [radiogroup](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-radiogroup) | [HTMLCommandElement](http://www.w3.org/TR/html5/interactive-elements.html#htmlcommandelement) |
| [**datalist**](http://www.w3.org/TR/html5/the-button-element.html#the-datalist-element) | Container for options for [combo box control](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-list) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLDataListElement](http://www.w3.org/TR/html5/the-button-element.html#htmldatalistelement) |
| [**dd**](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) | Content for corresponding [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) element(s) | none | [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**del**](http://www.w3.org/TR/html5/edits.html#the-del-element) | A removal from the document | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [transparent](http://www.w3.org/TR/html5/content-models.html#transparent) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [cite](http://www.w3.org/TR/html5/edits.html#attr-mod-cite); [datetime](http://www.w3.org/TR/html5/edits.html#attr-mod-datetime) | [HTMLModElement](http://www.w3.org/TR/html5/edits.html#htmlmodelement) |
| [**details**](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) | Disclosure control for hiding details | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [summary](http://www.w3.org/TR/html5/interactive-elements.html#the-summary-element)\*; [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [open](http://www.w3.org/TR/html5/interactive-elements.html#attr-details-open) | [HTMLDetailsElement](http://www.w3.org/TR/html5/interactive-elements.html#htmldetailselement) |
| [**dfn**](http://www.w3.org/TR/html5/text-level-semantics.html#the-dfn-element) | Defining instance | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**div**](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) | Generic flow container | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLDivElement](http://www.w3.org/TR/html5/grouping-content.html#htmldivelement) |
| [**dl**](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) | Association list consisting of zero or more name-value groups | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element)\*; [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLDListElement](http://www.w3.org/TR/html5/grouping-content.html#htmldlistelement) |
| [**dt**](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) | Legend for corresponding [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) element(s) | none | [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**em**](http://www.w3.org/TR/html5/text-level-semantics.html#the-em-element) | Stress emphasis | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**embed**](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) | [Plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-embed-src); [type](http://www.w3.org/TR/html5/the-iframe-element.html#attr-embed-type); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); any\* | [HTMLEmbedElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlembedelement) |
| [**fieldset**](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) | Group of form controls | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element)\*; [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [disabled](http://www.w3.org/TR/html5/forms.html#attr-fieldset-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name) | [HTMLFieldSetElement](http://www.w3.org/TR/html5/forms.html#htmlfieldsetelement) |
| [**figcaption**](http://www.w3.org/TR/html5/grouping-content.html#the-figcaption-element) | Caption for [figure](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element) | none | [figure](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**figure**](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element) | Figure with optional caption | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [figcaption](http://www.w3.org/TR/html5/grouping-content.html#the-figcaption-element)\*; [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**footer**](http://www.w3.org/TR/html5/sections.html#the-footer-element) | Footer for a page or section | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**form**](http://www.w3.org/TR/html5/forms.html#the-form-element) | User-submittable form | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [accept-charset](http://www.w3.org/TR/html5/forms.html#attr-form-accept-charset); [action](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-action); [autocomplete](http://www.w3.org/TR/html5/forms.html#attr-form-autocomplete); [enctype](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype); [method](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-method); [name](http://www.w3.org/TR/html5/forms.html#attr-form-name); [novalidate](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-novalidate); [target](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-target) | [HTMLFormElement](http://www.w3.org/TR/html5/forms.html#htmlformelement) |
| [**h1**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)**,** [**h2**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)**,** [**h3**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)**,** [**h4**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)**,** [**h5**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements)**,** [**h6**](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | Section heading | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [heading](http://www.w3.org/TR/html5/content-models.html#heading-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) |
| [**head**](http://www.w3.org/TR/html5/semantics.html#the-head-element) | Container for document metadata | none | [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) | [metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLHeadElement](http://www.w3.org/TR/html5/semantics.html#htmlheadelement) |
| [**header**](http://www.w3.org/TR/html5/sections.html#the-header-element) | Introductory or navigational aids for a page or section | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**hgroup**](http://www.w3.org/TR/html5/sections.html#the-hgroup-element) | heading group | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [heading](http://www.w3.org/TR/html5/content-models.html#heading-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | One or more [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements), and/or [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**hr**](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) | Thematic break | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLHRElement](http://www.w3.org/TR/html5/grouping-content.html#htmlhrelement) |
| [**html**](http://www.w3.org/TR/html5/semantics.html#the-html-element) | Root element | none | none\* | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element)\*; [body](http://www.w3.org/TR/html5/sections.html#the-body-element)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [manifest](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest) | [HTMLHtmlElement](http://www.w3.org/TR/html5/semantics.html#htmlhtmlelement) |
| [**i**](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element) | Alternate voice | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**iframe**](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) | [Nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | text\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-src); [srcdoc](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-srcdoc); [name](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-name); [sandbox](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox); [seamless](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-seamless); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) | [HTMLIFrameElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmliframeelement) |
| [**img**](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) | Image | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content)\* | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [alt](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-alt); [src](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-src); [usemap](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap); [ismap](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-ismap); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) | [HTMLImageElement](http://www.w3.org/TR/html5/embedded-content-1.html#htmlimageelement) |
| [**input**](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) | Form control | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content)\*; [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [resettable](http://www.w3.org/TR/html5/forms.html#category-reset); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [accept](http://www.w3.org/TR/html5/number-state.html#attr-input-accept); [alt](http://www.w3.org/TR/html5/number-state.html#attr-input-alt); [autocomplete](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-autocomplete); [autofocus](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [checked](http://www.w3.org/TR/html5/the-input-element.html#attr-input-checked); [dirname](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-dirname); [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [formaction](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formaction); [formenctype](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formenctype); [formmethod](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formmethod); [formnovalidate](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formnovalidate); [formtarget](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formtarget); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [list](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-list); [max](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-max); [maxlength](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-maxlength); [min](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-min); [multiple](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-multiple); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [pattern](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-pattern); [placeholder](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-placeholder); [readonly](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-readonly); [required](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-required); [size](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-size); [src](http://www.w3.org/TR/html5/number-state.html#attr-input-src); [step](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-step); [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type); [value](http://www.w3.org/TR/html5/the-input-element.html#attr-input-value); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width) | [HTMLInputElement](http://www.w3.org/TR/html5/the-input-element.html#htmlinputelement) |
| [**ins**](http://www.w3.org/TR/html5/edits.html#the-ins-element) | An addition to the document | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [transparent](http://www.w3.org/TR/html5/content-models.html#transparent) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [cite](http://www.w3.org/TR/html5/edits.html#attr-mod-cite); [datetime](http://www.w3.org/TR/html5/edits.html#attr-mod-datetime) | [HTMLModElement](http://www.w3.org/TR/html5/edits.html#htmlmodelement) |
| [**kbd**](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element) | User input | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**keygen**](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element) | Cryptographic key-pair generator form control | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [resettable](http://www.w3.org/TR/html5/forms.html#category-reset); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [autofocus](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [challenge](http://www.w3.org/TR/html5/the-button-element.html#attr-keygen-challenge); [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [keytype](http://www.w3.org/TR/html5/the-button-element.html#attr-keygen-keytype); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name) | [HTMLKeygenElement](http://www.w3.org/TR/html5/the-button-element.html#htmlkeygenelement) |
| [**label**](http://www.w3.org/TR/html5/forms.html#the-label-element) | Caption for a form control | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [for](http://www.w3.org/TR/html5/forms.html#attr-label-for) | [HTMLLabelElement](http://www.w3.org/TR/html5/forms.html#htmllabelelement) |
| [**legend**](http://www.w3.org/TR/html5/forms.html#the-legend-element) | Caption for [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) | none | [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLLegendElement](http://www.w3.org/TR/html5/forms.html#htmllegendelement) |
| [**li**](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) | List item | none | [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element); [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element); [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [value](http://www.w3.org/TR/html5/grouping-content.html#attr-li-value)\* | [HTMLLIElement](http://www.w3.org/TR/html5/grouping-content.html#htmllielement) |
| [**link**](http://www.w3.org/TR/html5/semantics.html#the-link-element) | Link metadata | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\*; [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element)\*; [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [href](http://www.w3.org/TR/html5/semantics.html#attr-link-href); [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel); [media](http://www.w3.org/TR/html5/semantics.html#attr-link-media); [hreflang](http://www.w3.org/TR/html5/semantics.html#attr-link-hreflang); [type](http://www.w3.org/TR/html5/semantics.html#attr-link-type); [sizes](http://www.w3.org/TR/html5/links.html#attr-link-sizes) | [HTMLLinkElement](http://www.w3.org/TR/html5/semantics.html#htmllinkelement) |
| [**map**](http://www.w3.org/TR/html5/the-map-element.html#the-map-element) | [Image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [transparent](http://www.w3.org/TR/html5/content-models.html#transparent); [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [name](http://www.w3.org/TR/html5/the-map-element.html#attr-map-name) | [HTMLMapElement](http://www.w3.org/TR/html5/the-map-element.html#htmlmapelement) |
| [**mark**](http://www.w3.org/TR/html5/text-level-semantics.html#the-mark-element) | Highlight | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**menu**](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) | Menu of commands | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content)\* | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element)\*; [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [type](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-type); [label](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-label) | [HTMLMenuElement](http://www.w3.org/TR/html5/interactive-elements.html#htmlmenuelement) |
| [**meta**](http://www.w3.org/TR/html5/semantics.html#the-meta-element) | Text metadata | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\*; [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element)\*; [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [name](http://www.w3.org/TR/html5/semantics.html#attr-meta-name); [http-equiv](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv); [content](http://www.w3.org/TR/html5/semantics.html#attr-meta-content); [charset](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) | [HTMLMetaElement](http://www.w3.org/TR/html5/semantics.html#htmlmetaelement) |
| [**meter**](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element) | Gauge | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [value](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-value); [min](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-min); [max](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-max); [low](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-low); [high](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-high); [optimum](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-optimum); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form) | [HTMLMeterElement](http://www.w3.org/TR/html5/the-button-element.html#htmlmeterelement) |
| [**nav**](http://www.w3.org/TR/html5/sections.html#the-nav-element) | Section with navigational links | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning](http://www.w3.org/TR/html5/content-models.html#sectioning-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**noscript**](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) | Fallback content for script | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element)\*; [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | varies\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**object**](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) | Image, [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context), or [plugin](http://www.w3.org/TR/html5/infrastructure.html#plugin) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content)\*; [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element)\*; [transparent](http://www.w3.org/TR/html5/content-models.html#transparent) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [data](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-data); [type](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-type); [name](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-name); [usemap](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) | [HTMLObjectElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlobjectelement) |
| [**ol**](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) | Ordered list | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [reversed](http://www.w3.org/TR/html5/grouping-content.html#attr-ol-reversed); [start](http://www.w3.org/TR/html5/grouping-content.html#attr-ol-start) | [HTMLOListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlolistelement) |
| [**optgroup**](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) | Group of options in a list box | none | [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) | [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [disabled](http://www.w3.org/TR/html5/the-button-element.html#attr-optgroup-disabled); [label](http://www.w3.org/TR/html5/the-button-element.html#attr-optgroup-label) | [HTMLOptGroupElement](http://www.w3.org/TR/html5/the-button-element.html#htmloptgroupelement) |
| [**option**](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) | Option in a list box or combo box control | none | [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [datalist](http://www.w3.org/TR/html5/the-button-element.html#the-datalist-element); [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) | [text](http://www.w3.org/TR/html5/content-models.html#text-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [disabled](http://www.w3.org/TR/html5/the-button-element.html#attr-option-disabled); [label](http://www.w3.org/TR/html5/the-button-element.html#attr-option-label); [selected](http://www.w3.org/TR/html5/the-button-element.html#attr-option-selected); [value](http://www.w3.org/TR/html5/the-button-element.html#attr-option-value) | [HTMLOptionElement](http://www.w3.org/TR/html5/the-button-element.html#htmloptionelement) |
| [**output**](http://www.w3.org/TR/html5/the-button-element.html#the-output-element) | Calculated output value | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [resettable](http://www.w3.org/TR/html5/forms.html#category-reset); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [for](http://www.w3.org/TR/html5/the-button-element.html#attr-output-for); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name) | [HTMLOutputElement](http://www.w3.org/TR/html5/the-button-element.html#htmloutputelement) |
| [**p**](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) | Paragraph | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLParagraphElement](http://www.w3.org/TR/html5/grouping-content.html#htmlparagraphelement) |
| [**param**](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) | Parameter for [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) | none | [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [name](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-name); [value](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-value) | [HTMLParamElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlparamelement) |
| [**pre**](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) | Block of preformatted text | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLPreElement](http://www.w3.org/TR/html5/grouping-content.html#htmlpreelement) |
| [**progress**](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element) | Progress bar | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [value](http://www.w3.org/TR/html5/the-button-element.html#attr-progress-value); [max](http://www.w3.org/TR/html5/the-button-element.html#attr-progress-max); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form) | [HTMLProgressElement](http://www.w3.org/TR/html5/the-button-element.html#htmlprogresselement) |
| [**q**](http://www.w3.org/TR/html5/text-level-semantics.html#the-q-element) | Quotation | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [cite](http://www.w3.org/TR/html5/text-level-semantics.html#attr-q-cite) | [HTMLQuoteElement](http://www.w3.org/TR/html5/grouping-content.html#htmlquoteelement) |
| [**rp**](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) | Parenthesis for ruby annotation text | none | [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**rt**](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) | Ruby annotation text | none | [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**ruby**](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) | Ruby annotation(s) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element); [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**s**](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element) | Inaccurate text | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**samp**](http://www.w3.org/TR/html5/text-level-semantics.html#the-samp-element) | Computer output | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**script**](http://www.w3.org/TR/html5/scripting-1.html#the-script-element) | Embedded script | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | script, data, or script documentation\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/scripting-1.html#attr-script-src); [async](http://www.w3.org/TR/html5/scripting-1.html#attr-script-async); [defer](http://www.w3.org/TR/html5/scripting-1.html#attr-script-defer); [type](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type); [charset](http://www.w3.org/TR/html5/scripting-1.html#attr-script-charset) | [HTMLScriptElement](http://www.w3.org/TR/html5/scripting-1.html#htmlscriptelement) |
| [**section**](http://www.w3.org/TR/html5/sections.html#the-section-element) | Generic document or application section | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [sectioning](http://www.w3.org/TR/html5/content-models.html#sectioning-content); [formatBlock candidate](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**select**](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) | List box control | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [resettable](http://www.w3.org/TR/html5/forms.html#category-reset); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element), [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [autofocus](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [multiple](http://www.w3.org/TR/html5/the-button-element.html#attr-select-multiple); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [required](http://www.w3.org/TR/html5/the-button-element.html#attr-select-required); [size](http://www.w3.org/TR/html5/the-button-element.html#attr-select-size) | [HTMLSelectElement](http://www.w3.org/TR/html5/the-button-element.html#htmlselectelement) |
| [**small**](http://www.w3.org/TR/html5/text-level-semantics.html#the-small-element) | Side comment | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**source**](http://www.w3.org/TR/html5/the-iframe-element.html#the-source-element) | Media source for [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) or [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) | none | [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element); [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-src); [type](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-type); [media](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-media) | [HTMLSourceElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlsourceelement) |
| [**span**](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) | Generic phrasing container | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLSpanElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlspanelement) |
| [**strong**](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element) | Importance | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**style**](http://www.w3.org/TR/html5/semantics.html#the-style-element) | Embedded styling information | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content); [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element)\*; [flow](http://www.w3.org/TR/html5/content-models.html#flow-content)\* | varies\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [media](http://www.w3.org/TR/html5/semantics.html#attr-style-media); [type](http://www.w3.org/TR/html5/semantics.html#attr-style-type); [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) | [HTMLStyleElement](http://www.w3.org/TR/html5/semantics.html#htmlstyleelement) |
| [**sub**](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements) | Subscript | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**summary**](http://www.w3.org/TR/html5/interactive-elements.html#the-summary-element) | Caption for [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) | none | [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**sup**](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements) | Superscript | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**table**](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | Table | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element)\*; [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element)\*; [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element)\*; [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element)\*; [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element)\*; [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [border](http://www.w3.org/TR/html5/tabular-data.html#attr-table-border) | [HTMLTableElement](http://www.w3.org/TR/html5/tabular-data.html#htmltableelement) |
| [**tbody**](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) | Group of rows in a table | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) |
| [**td**](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) | Table cell | [sectioning root](http://www.w3.org/TR/html5/sections.html#sectioning-root) | [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [colspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-colspan); [rowspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-rowspan); [headers](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-headers) | [HTMLTableDataCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltabledatacellelement) |
| [**textarea**](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | Multiline text field | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content); [listed](http://www.w3.org/TR/html5/forms.html#category-listed); [labelable](http://www.w3.org/TR/html5/forms.html#category-label); [submittable](http://www.w3.org/TR/html5/forms.html#category-submit); [resettable](http://www.w3.org/TR/html5/forms.html#category-reset); [form-associated](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [text](http://www.w3.org/TR/html5/content-models.html#text-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [autofocus](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [cols](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-cols); [disabled](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [maxlength](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-maxlength); [name](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [placeholder](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-placeholder); [readonly](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-readonly); [required](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-required); [rows](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-rows); [wrap](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-wrap) | [HTMLTextAreaElement](http://www.w3.org/TR/html5/the-button-element.html#htmltextareaelement) |
| [**tfoot**](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) | Group of footer rows in a table | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) |
| [**th**](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) | Table header cell | none | [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [colspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-colspan); [rowspan](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-rowspan); [headers](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-headers); [scope](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope) | [HTMLTableHeaderCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltableheadercellelement) |
| [**thead**](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element) | Group of heading rows in a table | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) |
| [**time**](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element) | Date and/or time | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [datetime](http://www.w3.org/TR/html5/text-level-semantics.html#attr-time-datetime); [pubdate](http://www.w3.org/TR/html5/text-level-semantics.html#attr-time-pubdate) | [HTMLTimeElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmltimeelement) |
| [**title**](http://www.w3.org/TR/html5/semantics.html#the-title-element) | Document title | [metadata](http://www.w3.org/TR/html5/content-models.html#metadata-content) | [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) | [text](http://www.w3.org/TR/html5/content-models.html#text-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTitleElement](http://www.w3.org/TR/html5/semantics.html#htmltitleelement) |
| [**tr**](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | Table row | none | [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element); [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element); [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element); [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) | [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element)\*; [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLTableRowElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablerowelement) |
| [**track**](http://www.w3.org/TR/html5/the-iframe-element.html#the-track-element) | Timed text track | none | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element); [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [default](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-default); [kind](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind); [label](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-label); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-src); [srclang](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-srclang) | [HTMLTrackElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmltrackelement) |
| [**u**](http://www.w3.org/TR/html5/text-level-semantics.html#the-u-element) | Keywords | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**ul**](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) | List | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content) | [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLUListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlulistelement) |
| [**var**](http://www.w3.org/TR/html5/text-level-semantics.html#the-var-element) | Variable | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [**video**](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) | Video player | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content); [embedded](http://www.w3.org/TR/html5/content-models.html#embedded-content); [interactive](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [source](http://www.w3.org/TR/html5/the-iframe-element.html#the-source-element)\*; [transparent](http://www.w3.org/TR/html5/content-models.html#transparent)\* | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes); [src](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-src); [poster](http://www.w3.org/TR/html5/the-iframe-element.html#attr-video-poster); [preload](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload); [autoplay](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-autoplay); [mediagroup](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-mediagroup); [loop](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-loop); [controls](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls); [width](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [height](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) | [HTMLVideoElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlvideoelement) |
| [**wbr**](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element) | Line breaking opportunity | [flow](http://www.w3.org/TR/html5/content-models.html#flow-content); [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [phrasing](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | empty | [globals](http://www.w3.org/TR/html5/elements.html#global-attributes) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |

An asterisk (\*) in a cell indicates that the actual rules are more complicated than indicated in the table above.

† Categories in the "Parents" column refer to parents that list the given categories in their content model, not to elements that themselves are in those categories. For example, the [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element's "Parents" column says "phrasing", so any element whose content model contains the "phrasing" category could be a parent of an [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element. Since the "flow" category includes all the "phrasing" elements, that means the [address](http://www.w3.org/TR/html5/sections.html#the-address-element) element could be a parent to an [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) element.

### Element content categories

*.*

| List of element content categories | | |
| --- | --- | --- |
| **Category** | **Elements** | **Elements with exceptions** |
| [Metadata content](http://www.w3.org/TR/html5/content-models.html#metadata-content) | [base](http://www.w3.org/TR/html5/semantics.html#the-base-element); [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element); [link](http://www.w3.org/TR/html5/semantics.html#the-link-element); [meta](http://www.w3.org/TR/html5/semantics.html#the-meta-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element); [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element); [style](http://www.w3.org/TR/html5/semantics.html#the-style-element); [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) | — |
| [Flow content](http://www.w3.org/TR/html5/content-models.html#flow-content) | [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element); [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element); [address](http://www.w3.org/TR/html5/sections.html#the-address-element); [article](http://www.w3.org/TR/html5/sections.html#the-article-element); [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element); [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element); [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element); [bdi](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdi-element); [bdo](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdo-element); [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element); [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element); [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element); [cite](http://www.w3.org/TR/html5/text-level-semantics.html#the-cite-element); [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element); [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element); [datalist](http://www.w3.org/TR/html5/the-button-element.html#the-datalist-element); [del](http://www.w3.org/TR/html5/edits.html#the-del-element); [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element); [dfn](http://www.w3.org/TR/html5/text-level-semantics.html#the-dfn-element); [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element); [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element); [em](http://www.w3.org/TR/html5/text-level-semantics.html#the-em-element); [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element); [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element); [figure](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element); [footer](http://www.w3.org/TR/html5/sections.html#the-footer-element); [form](http://www.w3.org/TR/html5/forms.html#the-form-element); [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [header](http://www.w3.org/TR/html5/sections.html#the-header-element); [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element); [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element); [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element); [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element); [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [ins](http://www.w3.org/TR/html5/edits.html#the-ins-element); [kbd](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [label](http://www.w3.org/TR/html5/forms.html#the-label-element); [map](http://www.w3.org/TR/html5/the-map-element.html#the-map-element); [mark](http://www.w3.org/TR/html5/text-level-semantics.html#the-mark-element); [math](http://www.w3.org/TR/html5/the-map-element.html#math); [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element); [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element); [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element); [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element); [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element); [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element); [q](http://www.w3.org/TR/html5/text-level-semantics.html#the-q-element); [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element); [s](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element); [samp](http://www.w3.org/TR/html5/text-level-semantics.html#the-samp-element); [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element); [section](http://www.w3.org/TR/html5/sections.html#the-section-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [small](http://www.w3.org/TR/html5/text-level-semantics.html#the-small-element); [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element); [strong](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element); [sub](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements); [sup](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements); [svg](http://www.w3.org/TR/html5/the-map-element.html#svg); [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element); [time](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element); [u](http://www.w3.org/TR/html5/text-level-semantics.html#the-u-element); [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element); [var](http://www.w3.org/TR/html5/text-level-semantics.html#the-var-element); [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element); [wbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element); [Text](http://www.w3.org/TR/html5/content-models.html#text-content) | [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) (if it is a descendant of a [map](http://www.w3.org/TR/html5/the-map-element.html#the-map-element) element); [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) (if the [scoped](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) attribute is present) |
| [Sectioning content](http://www.w3.org/TR/html5/content-models.html#sectioning-content) | [article](http://www.w3.org/TR/html5/sections.html#the-article-element); [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element); [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element); [section](http://www.w3.org/TR/html5/sections.html#the-section-element) | — |
| [Heading content](http://www.w3.org/TR/html5/content-models.html#heading-content) | [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element) | — |
| [Phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content) | [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element); [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element); [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element); [bdi](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdi-element); [bdo](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdo-element); [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element); [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element); [cite](http://www.w3.org/TR/html5/text-level-semantics.html#the-cite-element); [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element); [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element); [datalist](http://www.w3.org/TR/html5/the-button-element.html#the-datalist-element); [dfn](http://www.w3.org/TR/html5/text-level-semantics.html#the-dfn-element); [em](http://www.w3.org/TR/html5/text-level-semantics.html#the-em-element); [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element); [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element); [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element); [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [kbd](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [label](http://www.w3.org/TR/html5/forms.html#the-label-element); [mark](http://www.w3.org/TR/html5/text-level-semantics.html#the-mark-element); [math](http://www.w3.org/TR/html5/the-map-element.html#math); [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element); [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element); [q](http://www.w3.org/TR/html5/text-level-semantics.html#the-q-element); [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element); [s](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element); [samp](http://www.w3.org/TR/html5/text-level-semantics.html#the-samp-element); [script](http://www.w3.org/TR/html5/scripting-1.html#the-script-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [small](http://www.w3.org/TR/html5/text-level-semantics.html#the-small-element); [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element); [strong](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element); [sub](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements); [sup](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements); [svg](http://www.w3.org/TR/html5/the-map-element.html#svg); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element); [time](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element); [u](http://www.w3.org/TR/html5/text-level-semantics.html#the-u-element); [var](http://www.w3.org/TR/html5/text-level-semantics.html#the-var-element); [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element); [wbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element); [Text](http://www.w3.org/TR/html5/content-models.html#text-content) | [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) (if it contains only [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content)); [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) (if it is a descendant of a [map](http://www.w3.org/TR/html5/the-map-element.html#the-map-element) element); [del](http://www.w3.org/TR/html5/edits.html#the-del-element) (if it contains only [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content)); [ins](http://www.w3.org/TR/html5/edits.html#the-ins-element) (if it contains only [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content)); [map](http://www.w3.org/TR/html5/the-map-element.html#the-map-element) (if it contains only [phrasing content](http://www.w3.org/TR/html5/content-models.html#phrasing-content)) |
| [Embedded content](http://www.w3.org/TR/html5/content-models.html#embedded-content) | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) [math](http://www.w3.org/TR/html5/the-map-element.html#math) [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) [svg](http://www.w3.org/TR/html5/the-map-element.html#svg) [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) | — |
| [Interactive content](http://www.w3.org/TR/html5/content-models.html#interactive-content) | [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element); [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element); [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element); [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [label](http://www.w3.org/TR/html5/forms.html#the-label-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element); | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) (if the [controls](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls) attribute is present); [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) (if the [usemap](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap) attribute is present); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) (if the [type](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) attribute is not in the [Hidden](http://www.w3.org/TR/html5/states-of-the-type-attribute.html#hidden-state) state); [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) (if the [type](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-type) attribute is in the [toolbar](http://www.w3.org/TR/html5/interactive-elements.html#toolbar-state) state); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) (if the [usemap](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap) attribute is present); [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) (if the [controls](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls) attribute is present) |
| [Sectioning roots](http://www.w3.org/TR/html5/sections.html#sectioning-root) | [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element); [body](http://www.w3.org/TR/html5/sections.html#the-body-element); [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element); [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element); [figure](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element); [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) | — |
| [Form-associated elements](http://www.w3.org/TR/html5/forms.html#form-associated-element) | [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [label](http://www.w3.org/TR/html5/forms.html#the-label-element); [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | — |
| [Listed elements](http://www.w3.org/TR/html5/forms.html#category-listed) | [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | — |
| [Labelable elements](http://www.w3.org/TR/html5/forms.html#category-label) | [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | — |
| [Submittable elements](http://www.w3.org/TR/html5/forms.html#category-submit) | [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element); [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | — |
| [Resettable elements](http://www.w3.org/TR/html5/forms.html#category-reset) | [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element); [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element); [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element); [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element); [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | — |
| [formatBlock candidates](http://www.w3.org/TR/html5/dnd.html#formatblock-candidate) | [section](http://www.w3.org/TR/html5/sections.html#the-section-element); [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element); [article](http://www.w3.org/TR/html5/sections.html#the-article-element); [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element); [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements); [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element); [header](http://www.w3.org/TR/html5/sections.html#the-header-element); [footer](http://www.w3.org/TR/html5/sections.html#the-footer-element); [address](http://www.w3.org/TR/html5/sections.html#the-address-element); [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element); [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element); [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element); [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) | — |

### Attributes

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| List of attributes (excluding event handler content attributes) | | | |
| --- | --- | --- | --- |
| **Attribute** | **Element(s)** | **Description** | **Value** |
| **accept** | [input](http://www.w3.org/TR/html5/number-state.html#attr-input-accept) | Hint for expected file type in [file upload controls](http://www.w3.org/TR/html5/number-state.html#file-upload-state) | [Set of comma-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-comma-separated-tokens)\* consisting of [valid MIME types with no parameters](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type) or audio/\*, video/\*, or image/\* |
| **accept-charset** | [form](http://www.w3.org/TR/html5/forms.html#attr-form-accept-charset) | Character encodings to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Ordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#ordered-set-of-unique-space-separated-tokens), [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive), consisting of [preferred MIME names](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of [ASCII-compatible character encodings](http://www.w3.org/TR/html5/infrastructure.html#ascii-compatible-character-encoding)\* |
| **accesskey** | [HTML elements](http://www.w3.org/TR/html5/editing.html#the-accesskey-attribute) | Keyboard shortcut to activate or focus element | [Ordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#ordered-set-of-unique-space-separated-tokens), [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive), consisting of one Unicode code point in length |
| **action** | [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-action) | [URL](http://www.w3.org/TR/html5/urls.html#url) to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces) |
| **alt** | [area](http://www.w3.org/TR/html5/the-map-element.html#attr-area-alt); [img](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-alt); [input](http://www.w3.org/TR/html5/number-state.html#attr-input-alt) | Replacement text for use when images are not available | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **async** | [script](http://www.w3.org/TR/html5/scripting-1.html#attr-script-async) | Execute script asynchronously | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **autocomplete** | [form](http://www.w3.org/TR/html5/forms.html#attr-form-autocomplete); [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-autocomplete) | Prevent the user agent from providing autocompletions for the form control(s) | "on"; "off" |
| **autofocus** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [keygen](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [select](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus); [textarea](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-autofocus) | Automatically focus the form control when the page is loaded | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **autoplay** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-autoplay); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-autoplay) | Hint that the [media resource](http://www.w3.org/TR/html5/the-iframe-element.html#media-resource) can be started automatically when the page is loaded | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **border** | [border](http://www.w3.org/TR/html5/tabular-data.html#attr-table-border) | Explicit indication that the [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) element is not being used for layout purposes | The empty string, or "1" |
| **challenge** | [keygen](http://www.w3.org/TR/html5/the-button-element.html#attr-keygen-challenge) | String to package with the generated and signed public key | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **charset** | [meta](http://www.w3.org/TR/html5/semantics.html#attr-meta-charset) | [Character encoding declaration](http://www.w3.org/TR/html5/semantics.html#character-encoding-declaration) | [Preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of an encoding\* |
| **charset** | [script](http://www.w3.org/TR/html5/scripting-1.html#attr-script-charset) | Character encoding of the external script resource | [Preferred MIME name](http://www.w3.org/TR/html5/infrastructure.html#preferred-mime-name) of an encoding\* |
| **checked** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-checked); [input](http://www.w3.org/TR/html5/the-input-element.html#attr-input-checked) | Whether the command or control is checked | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **cite** | [blockquote](http://www.w3.org/TR/html5/grouping-content.html#attr-blockquote-cite); [del](http://www.w3.org/TR/html5/edits.html#attr-mod-cite); [ins](http://www.w3.org/TR/html5/edits.html#attr-mod-cite); [q](http://www.w3.org/TR/html5/text-level-semantics.html#attr-q-cite) | Link to the source of the quotation or more information about the edit | [Valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces) |
| **class** | [HTML elements](http://www.w3.org/TR/html5/elements.html#classes) | Classes to which the element belongs | [Set of space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-space-separated-tokens) |
| **cols** | [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-cols) | Maximum number of characters per line | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) greater than zero |
| **colspan** | [td](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-colspan); [th](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-colspan) | Number of columns that the cell is to span | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) greater than zero |
| **content** | [meta](http://www.w3.org/TR/html5/semantics.html#attr-meta-content) | Value of the element | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **contenteditable** | [HTML elements](http://www.w3.org/TR/html5/editing.html#attr-contenteditable) | Whether the element is [editable](http://www.w3.org/TR/html5/editing.html#editable) | "true"; "false" |
| **contextmenu** | [HTML elements](http://www.w3.org/TR/html5/interactive-elements.html#attr-contextmenu) | The element's context menu | [ID](http://www.w3.org/TR/html5/elements.html#concept-id)\* |
| **controls** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-controls) | Show user agent controls | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **coords** | [area](http://www.w3.org/TR/html5/the-map-element.html#attr-area-coords) | Coordinates for the shape to be created in an [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) | [Valid list of integers](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-list-of-integers)\* |
| **data** | [object](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-data) | Address of the resource | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **datetime** | [del](http://www.w3.org/TR/html5/edits.html#attr-mod-datetime); [ins](http://www.w3.org/TR/html5/edits.html#attr-mod-datetime) | Date and (optionally) time of the change | [Valid date string with optional time](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-date-string-with-optional-time) |
| **datetime** | [time](http://www.w3.org/TR/html5/text-level-semantics.html#attr-time-datetime) | Value of the element | [Valid date or time string](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-date-or-time-string)\* |
| **default** | [track](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-default) | Enable the track if no other [text track](http://www.w3.org/TR/html5/the-iframe-element.html#text-track) is more suitable. | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **defer** | [script](http://www.w3.org/TR/html5/scripting-1.html#attr-script-defer) | Defer script execution | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **dir** | [HTML elements](http://www.w3.org/TR/html5/elements.html#the-dir-attribute) | [The text directionality](http://www.w3.org/TR/html5/elements.html#the-directionality) of the element | "ltr"; "rtl" |
| **dirname** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-dirname); [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-dirname) | Name of form field to use for sending the element's [directionality](http://www.w3.org/TR/html5/elements.html#the-directionality) in [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **disabled** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-disabled); [fieldset](http://www.w3.org/TR/html5/forms.html#attr-fieldset-disabled); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [keygen](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [optgroup](http://www.w3.org/TR/html5/the-button-element.html#attr-optgroup-disabled); [option](http://www.w3.org/TR/html5/the-button-element.html#attr-option-disabled); [select](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled); [textarea](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-disabled) | Whether the form control is disabled | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **draggable** | [HTML elements](http://www.w3.org/TR/html5/dnd.html#the-draggable-attribute) | Whether the element is draggable | "true"; "false" |
| **dropzone** | [HTML elements](http://www.w3.org/TR/html5/dnd.html#the-dropzone-attribute) | Accepted item types for drag-and-drop | [Unordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#unordered-set-of-unique-space-separated-tokens), [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive), consisting of accepted types and drag feedback\* |
| **enctype** | [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype) | Form data set encoding type to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | "[application/x-www-form-urlencoded](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-urlencoded)"; "[multipart/form-data](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-formdata)"; "[text/plain](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-text)" |
| **for** | [label](http://www.w3.org/TR/html5/forms.html#attr-label-for) | Associate the label with form control | [ID](http://www.w3.org/TR/html5/elements.html#concept-id)\* |
| **for** | [output](http://www.w3.org/TR/html5/the-button-element.html#attr-output-for) | Specifies controls from which the output was calculated | [Unordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#unordered-set-of-unique-space-separated-tokens), [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive), consisting of IDs\* |
| **form** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [fieldset](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [keygen](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [label](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [meter](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [object](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [output](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [progress](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [select](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form); [textarea](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fae-form) | Associates the control with a [form](http://www.w3.org/TR/html5/forms.html#the-form-element) element | [ID](http://www.w3.org/TR/html5/elements.html#concept-id)\* |
| **formaction** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formaction); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formaction) | [URL](http://www.w3.org/TR/html5/urls.html#url) to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces) |
| **formenctype** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formenctype); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formenctype) | Form data set encoding type to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | "[application/x-www-form-urlencoded](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-urlencoded)"; "[multipart/form-data](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-formdata)"; "[text/plain](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-enctype-text)" |
| **formmethod** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formmethod); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formmethod) | HTTP method to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | "GET"; "POST" |
| **formnovalidate** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formnovalidate); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formnovalidate) | Bypass form control validation for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **formtarget** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formtarget); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-formtarget) | [Browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword) |
| **headers** | [td](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-headers); [th](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-headers) | The header cells for this cell | [Unordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#unordered-set-of-unique-space-separated-tokens), [case-sensitive](http://www.w3.org/TR/html5/infrastructure.html#case-sensitive), consisting of IDs\* |
| **height** | [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#attr-canvas-height); [embed](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [iframe](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [img](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [input](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [object](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height); [video](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-height) | Vertical dimension | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) |
| **hidden** | [HTML elements](http://www.w3.org/TR/html5/editing.html#the-hidden-attribute) | Whether the element is relevant | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **high** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-high) | Low limit of high range | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number)\* |
| **href** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-href) | Address of the [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) | [Valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces) |
| **href** | [link](http://www.w3.org/TR/html5/semantics.html#attr-link-href) | Address of the [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **href** | [base](http://www.w3.org/TR/html5/semantics.html#attr-base-href) | [Document base URL](http://www.w3.org/TR/html5/urls.html#document-base-url) | [Valid URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-url-potentially-surrounded-by-spaces) |
| **hreflang** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-hreflang); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-hreflang); [link](http://www.w3.org/TR/html5/semantics.html#attr-link-hreflang) | Language of the linked resource | Valid BCP 47 language tag |
| **http-equiv** | [meta](http://www.w3.org/TR/html5/semantics.html#attr-meta-http-equiv) | Pragma directive | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **icon** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-icon) | Icon for the command | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **id** | [HTML elements](http://www.w3.org/TR/html5/elements.html#the-id-attribute) | The element's [ID](http://www.w3.org/TR/html5/elements.html#concept-id) | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **ismap** | [img](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-ismap) | Whether the image is a server-side image map | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **keytype** | [keygen](http://www.w3.org/TR/html5/the-button-element.html#attr-keygen-keytype) | The type of cryptographic key to generate | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **kind** | [track](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind) | The type of text track | "[subtitles](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind-subtitles)"; "[captions](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind-captions)"; "[descriptions](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind-descriptions)"; "[chapters](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind-chapters)"; "[metadata](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-kind-metadata)" |
| **label** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-label); [menu](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-label); [optgroup](http://www.w3.org/TR/html5/the-button-element.html#attr-optgroup-label); [option](http://www.w3.org/TR/html5/the-button-element.html#attr-option-label); [track](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-label) | User-visible label | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **lang** | [HTML elements](http://www.w3.org/TR/html5/elements.html#attr-lang) | [Language](http://www.w3.org/TR/html5/elements.html#language) of the element | Valid BCP 47 language tag or the empty string |
| **list** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-list) | List of autocomplete options | [ID](http://www.w3.org/TR/html5/elements.html#concept-id)\* |
| **loop** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-loop); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-loop) | Whether to loop the [media resource](http://www.w3.org/TR/html5/the-iframe-element.html#media-resource) | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **low** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-low) | High limit of low range | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number)\* |
| **manifest** | [html](http://www.w3.org/TR/html5/semantics.html#attr-html-manifest) | [Application cache manifest](http://www.w3.org/TR/html5/offline.html#concept-appcache-manifest) | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **max** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-max) | Maximum value | varies\* |
| **max** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-max); [progress](http://www.w3.org/TR/html5/the-button-element.html#attr-progress-max) | Upper bound of range | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number)\* |
| **maxlength** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-maxlength); [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-maxlength) | Maximum length of value | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) |
| **media** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-media); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-media); [link](http://www.w3.org/TR/html5/semantics.html#attr-link-media); [source](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-media); [style](http://www.w3.org/TR/html5/semantics.html#attr-style-media) | Applicable media | [Valid media query](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-media-query) |
| **mediagroup** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-mediagroup); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-mediagroup) | Groups [media elements](http://www.w3.org/TR/html5/the-iframe-element.html#media-element) together with an implicit [MediaController](http://www.w3.org/TR/html5/the-iframe-element.html#mediacontroller) | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **method** | [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-method) | HTTP method to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | "GET"; "POST" |
| **min** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-min) | Minimum value | varies\* |
| **min** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-min) | Lower bound of range | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number)\* |
| **multiple** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-multiple); [select](http://www.w3.org/TR/html5/the-button-element.html#attr-select-multiple) | Whether to allow multiple values | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **name** | [button](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [fieldset](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [input](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [keygen](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [output](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [select](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name); [textarea](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fe-name) | Name of form control to use for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) and in the [form.elements](http://www.w3.org/TR/html5/forms.html#dom-form-elements) API | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **name** | [form](http://www.w3.org/TR/html5/forms.html#attr-form-name) | Name of form to use in the [document.forms](http://www.w3.org/TR/html5/dom.html#dom-document-forms) API | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **name** | [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-name); [object](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-name) | Name of [nested browsing context](http://www.w3.org/TR/html5/browsers.html#nested-browsing-context) | [Valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword) |
| **name** | [map](http://www.w3.org/TR/html5/the-map-element.html#attr-map-name) | Name of [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) to reference from the [usemap](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap) attribute | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **name** | [meta](http://www.w3.org/TR/html5/semantics.html#attr-meta-name) | Metadata name | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **name** | [param](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-name) | Name of parameter | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **novalidate** | [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-novalidate) | Bypass form control validation for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **open** | [details](http://www.w3.org/TR/html5/interactive-elements.html#attr-details-open) | Whether the details are visible | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **optimum** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-optimum) | Optimum value in gauge | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number)\* |
| **pattern** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-pattern) | Pattern to be matched by the form control's value | Regular expression matching the JavaScript *Pattern* production |
| **placeholder** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-placeholder); [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-placeholder) | User-visible label to be placed within the form control | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text)\* |
| **poster** | [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-video-poster) | Poster frame to show prior to video playback | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **preload** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload) | Hints how much buffering the [media resource](http://www.w3.org/TR/html5/the-iframe-element.html#media-resource) will likely need | "[none](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload-none)"; "[metadata](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload-metadata)"; "[auto](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-preload-auto)" |
| **pubdate** | [time](http://www.w3.org/TR/html5/text-level-semantics.html#attr-time-pubdate) | Whether the element's value represents a publication time for the nearest [article](http://www.w3.org/TR/html5/sections.html#the-article-element) or [body](http://www.w3.org/TR/html5/sections.html#the-body-element) | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **radiogroup** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-radiogroup) | Name of group of commands to treat as a radio button group | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **readonly** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-readonly); [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-readonly) | Whether to allow the value to be edited by the user | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **rel** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-rel); [link](http://www.w3.org/TR/html5/semantics.html#attr-link-rel) | Relationship between the document containing the hyperlink and the destination resource | [Set of space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#set-of-space-separated-tokens)\* |
| **required** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-required); [select](http://www.w3.org/TR/html5/the-button-element.html#attr-select-required); [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-required) | Whether the control is required for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **reversed** | [ol](http://www.w3.org/TR/html5/grouping-content.html#attr-ol-reversed) | Number the list backwards | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **rows** | [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-rows) | Number of lines to show | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) greater than zero |
| **rowspan** | [td](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-rowspan); [th](http://www.w3.org/TR/html5/tabular-data.html#attr-tdth-rowspan) | Number of rows that the cell is to span | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) |
| **sandbox** | [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox) | Security rules for nested content | [Unordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#unordered-set-of-unique-space-separated-tokens), [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive), consisting of "[allow-same-origin](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox-allow-same-origin)", "[allow-forms](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox-allow-forms)", and "[allow-scripts](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-sandbox-allow-scripts)" |
| **spellcheck** | [HTML elements](http://www.w3.org/TR/html5/editing.html#attr-spellcheck) | Whether the element is to have its spelling and grammar checked | "true"; "false" |
| **scope** | [th](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope) | Specifies which cells the header cell applies to | "[row](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope-row)"; "[col](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope-col)"; "[rowgroup](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope-rowgroup)"; "[colgroup](http://www.w3.org/TR/html5/tabular-data.html#attr-th-scope-colgroup)" |
| **scoped** | [style](http://www.w3.org/TR/html5/semantics.html#attr-style-scoped) | Whether the styles apply to the entire document or just the parent subtree | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **seamless** | [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-seamless) | Whether to apply the document's styles to the nested content | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **selected** | [option](http://www.w3.org/TR/html5/the-button-element.html#attr-option-selected) | Whether the option is selected by default | [Boolean attribute](http://www.w3.org/TR/html5/common-microsyntaxes.html#boolean-attribute) |
| **shape** | [area](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape) | The kind of shape to be created in an [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) | "[circle](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-circle)"; "[default](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-default)"; "[poly](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-poly)"; "[rect](http://www.w3.org/TR/html5/the-map-element.html#attr-area-shape-keyword-rect)" |
| **size** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-size); [select](http://www.w3.org/TR/html5/the-button-element.html#attr-select-size) | Size of the control | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) greater than zero |
| **sizes** | [link](http://www.w3.org/TR/html5/links.html#attr-link-sizes) | Sizes of the icons (for [rel](http://www.w3.org/TR/html5/semantics.html#attr-link-rel)="[icon](http://www.w3.org/TR/html5/links.html#rel-icon)") | [Unordered set of unique space-separated tokens](http://www.w3.org/TR/html5/common-microsyntaxes.html#unordered-set-of-unique-space-separated-tokens), [ASCII case-insensitive](http://www.w3.org/TR/html5/infrastructure.html#ascii-case-insensitive), consisting of sizes\* |
| **span** | [col](http://www.w3.org/TR/html5/tabular-data.html#attr-col-span); [colgroup](http://www.w3.org/TR/html5/tabular-data.html#attr-colgroup-span) | Number of columns spanned by the element | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) greater than zero |
| **src** | [audio](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-src); [embed](http://www.w3.org/TR/html5/the-iframe-element.html#attr-embed-src); [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-src); [img](http://www.w3.org/TR/html5/embedded-content-1.html#attr-img-src); [input](http://www.w3.org/TR/html5/number-state.html#attr-input-src); [script](http://www.w3.org/TR/html5/scripting-1.html#attr-script-src); [source](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-src); [track](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-src); [video](http://www.w3.org/TR/html5/the-iframe-element.html#attr-media-src) | Address of the resource | [Valid non-empty URL potentially surrounded by spaces](http://www.w3.org/TR/html5/urls.html#valid-non-empty-url-potentially-surrounded-by-spaces) |
| **srcdoc** | [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#attr-iframe-srcdoc) | A document to render in the [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) | The source of [an iframe srcdoc document](http://www.w3.org/TR/html5/the-iframe-element.html#an-iframe-srcdoc-document)\* |
| **srclang** | [track](http://www.w3.org/TR/html5/the-iframe-element.html#attr-track-srclang) | Language of the text track | Valid BCP 47 language tag |
| **start** | [ol](http://www.w3.org/TR/html5/grouping-content.html#attr-ol-start) | [Ordinal value](http://www.w3.org/TR/html5/grouping-content.html#ordinal-value) of the first item | [Valid integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-integer) |
| **step** | [input](http://www.w3.org/TR/html5/common-input-element-attributes.html#attr-input-step) | Granularity to be matched by the form control's value | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number) greater than zero, or "any" |
| **style** | [HTML elements](http://www.w3.org/TR/html5/elements.html#the-style-attribute) | Presentational and formatting instructions | CSS declarations\* |
| **tabindex** | [HTML elements](http://www.w3.org/TR/html5/editing.html#attr-tabindex) | Whether the element is focusable, and the relative order of the element for the purposes of sequential focus navigation | [Valid integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-integer) |
| **target** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-target) | [Browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) [navigation](http://www.w3.org/TR/html5/history.html#navigate) | [Valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword) |
| **target** | [base](http://www.w3.org/TR/html5/semantics.html#attr-base-target) | Default [browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for [hyperlink](http://www.w3.org/TR/html5/links.html#hyperlink) [navigation](http://www.w3.org/TR/html5/history.html#navigate) and [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword) |
| **target** | [form](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#attr-fs-target) | [Browsing context](http://www.w3.org/TR/html5/browsers.html#browsing-context) for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Valid browsing context name or keyword](http://www.w3.org/TR/html5/browsers.html#valid-browsing-context-name-or-keyword) |
| **title** | [HTML elements](http://www.w3.org/TR/html5/elements.html#the-title-attribute) | Advisory information for the element | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **title** | [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#attr-abbr-title); [dfn](http://www.w3.org/TR/html5/text-level-semantics.html#attr-dfn-title) | Full term or expansion of abbreviation | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **title** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-title) | Hint describing the command | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **title** | [link](http://www.w3.org/TR/html5/semantics.html#attr-link-title) | Title of the link | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **title** | [link](http://www.w3.org/TR/html5/semantics.html#attr-link-title); [style](http://www.w3.org/TR/html5/semantics.html#attr-style-title) | Alternative style sheet set name | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **type** | [a](http://www.w3.org/TR/html5/links.html#attr-hyperlink-type); [area](http://www.w3.org/TR/html5/links.html#attr-hyperlink-type); [link](http://www.w3.org/TR/html5/semantics.html#attr-link-type) | Hint for the type of the referenced resource | [Valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type) |
| **type** | [button](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type) | Type of button | "[submit](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type-submit)"; "[reset](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type-reset)"; "[button](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type-button)" |
| **type** | [button](http://www.w3.org/TR/html5/the-button-element.html#attr-button-type); [input](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) | Type of form control | [input type keyword](http://www.w3.org/TR/html5/the-input-element.html#attr-input-type) |
| **type** | [command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-type) | Type of command | "[command](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-type-keyword-command)"; "[checkbox](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-type-keyword-checkbox)"; "[radio](http://www.w3.org/TR/html5/interactive-elements.html#attr-command-type-keyword-radio)" |
| **type** | [embed](http://www.w3.org/TR/html5/the-iframe-element.html#attr-embed-type); [object](http://www.w3.org/TR/html5/the-iframe-element.html#attr-object-type); [script](http://www.w3.org/TR/html5/scripting-1.html#attr-script-type); [source](http://www.w3.org/TR/html5/the-iframe-element.html#attr-source-type); [style](http://www.w3.org/TR/html5/semantics.html#attr-style-type) | Type of embedded resource | [Valid MIME type](http://www.w3.org/TR/html5/infrastructure.html#valid-mime-type) |
| **type** | [menu](http://www.w3.org/TR/html5/interactive-elements.html#attr-menu-type) | Type of menu | "[context](http://www.w3.org/TR/html5/interactive-elements.html#context-menu-state)"; "[toolbar](http://www.w3.org/TR/html5/interactive-elements.html#toolbar-state)" |
| **usemap** | [img](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap); [object](http://www.w3.org/TR/html5/the-map-element.html#attr-hyperlink-usemap) | Name of [image map](http://www.w3.org/TR/html5/the-map-element.html#image-map) to use | [Valid hash-name reference](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-hash-name-reference)\* |
| **value** | [button](http://www.w3.org/TR/html5/the-button-element.html#attr-button-value); [option](http://www.w3.org/TR/html5/the-button-element.html#attr-option-value) | Value to be used for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **value** | [input](http://www.w3.org/TR/html5/the-input-element.html#attr-input-value) | Value of the form control | varies\* |
| **value** | [li](http://www.w3.org/TR/html5/grouping-content.html#attr-li-value) | [Ordinal value](http://www.w3.org/TR/html5/grouping-content.html#ordinal-value) of the list item | [Valid integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-integer) |
| **value** | [meter](http://www.w3.org/TR/html5/the-button-element.html#attr-meter-value); [progress](http://www.w3.org/TR/html5/the-button-element.html#attr-progress-value) | Current value of the element | [Valid floating point number](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-floating-point-number) |
| **value** | [param](http://www.w3.org/TR/html5/the-iframe-element.html#attr-param-value) | Value of parameter | [Text](http://www.w3.org/TR/html5/elements.html#attribute-text) |
| **width** | [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#attr-canvas-width); [embed](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [iframe](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [img](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [input](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [object](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width); [video](http://www.w3.org/TR/html5/the-map-element.html#attr-dim-width) | Horizontal dimension | [Valid non-negative integer](http://www.w3.org/TR/html5/common-microsyntaxes.html#valid-non-negative-integer) |
| **wrap** | [textarea](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-wrap) | How the value of the form control is to be wrapped for [form submission](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#form-submission) | "[soft](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-wrap-soft)"; "[hard](http://www.w3.org/TR/html5/the-button-element.html#attr-textarea-wrap-hard)" |

An asterisk (\*) in a cell indicates that the actual rules are more complicated than indicated in the table above.

| List of event handler content attributes | | | |
| --- | --- | --- | --- |
| **Attribute** | **Element(s)** | **Description** | **Value** |
| **onabort** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onabort) | abort event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onafterprint** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onafterprint) | afterprint event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onbeforeprint** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeprint) | beforeprint event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onbeforeunload** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onbeforeunload) | beforeunload event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onblur** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onblur) | blur event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onblur** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onblur) | blur event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oncanplay** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplay) | [canplay](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-canplay) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oncanplaythrough** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oncanplaythrough) | [canplaythrough](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-canplaythrough) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onchange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onchange) | change event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onclick** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onclick) | [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oncontextmenu** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oncontextmenu) | contextmenu event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oncuechange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oncuechange) | cuechange event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondblclick** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondblclick) | dblclick event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondrag** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondrag) | [drag](http://www.w3.org/TR/html5/dnd.html#event-drag) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondragend** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondragend) | [dragend](http://www.w3.org/TR/html5/dnd.html#event-dragend) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondragenter** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondragenter) | [dragenter](http://www.w3.org/TR/html5/dnd.html#event-dragenter) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondragleave** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondragleave) | [dragleave](http://www.w3.org/TR/html5/dnd.html#event-dragleave) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondragover** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondragover) | [dragover](http://www.w3.org/TR/html5/dnd.html#event-dragover) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondragstart** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondragstart) | [dragstart](http://www.w3.org/TR/html5/dnd.html#event-dragstart) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondrop** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondrop) | [drop](http://www.w3.org/TR/html5/dnd.html#event-drop) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ondurationchange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ondurationchange) | [durationchange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-durationchange) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onemptied** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onemptied) | [emptied](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-emptied) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onended** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onended) | [ended](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-ended) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onerror** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onerror) | error event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object, and handler for [script error notifications](http://www.w3.org/TR/html5/webappapis.html#runtime-script-errors) | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onerror** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onerror) | error event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onfocus** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onfocus) | focus event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onfocus** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onfocus) | focus event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onhashchange** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onhashchange) | [hashchange](http://www.w3.org/TR/html5/history.html#event-hashchange) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oninput** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oninput) | input event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **oninvalid** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-oninvalid) | invalid event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onkeydown** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onkeydown) | keydown event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onkeypress** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onkeypress) | keypress event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onkeyup** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onkeyup) | keyup event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onload** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onload) | load event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onload** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onload) | load event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onloadeddata** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onloadeddata) | [loadeddata](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadeddata) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onloadedmetadata** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onloadedmetadata) | [loadedmetadata](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadedmetadata) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onloadstart** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onloadstart) | [loadstart](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-loadstart) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmessage** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onmessage) | message event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmousedown** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmousedown) | mousedown event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmousemove** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmousemove) | mousemove event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmouseout** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseout) | mouseout event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmouseover** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseover) | mouseover event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmouseup** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmouseup) | mouseup event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onmousewheel** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onmousewheel) | mousewheel event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onoffline** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onoffline) | [offline](http://www.w3.org/TR/html5/offline.html#event-offline) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ononline** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-ononline) | [online](http://www.w3.org/TR/html5/offline.html#event-online) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onpagehide** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpagehide) | [pagehide](http://www.w3.org/TR/html5/history.html#event-pagehide) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onpageshow** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpageshow) | [pageshow](http://www.w3.org/TR/html5/history.html#event-pageshow) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onpause** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onpause) | [pause](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-pause) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onplay** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onplay) | [play](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-play) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onplaying** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onplaying) | [playing](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-playing) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onpopstate** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onpopstate) | [popstate](http://www.w3.org/TR/html5/history.html#event-popstate) event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onprogress** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onprogress) | [progress](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-progress) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onratechange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onratechange) | [ratechange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-ratechange) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onreadystatechange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onreadystatechange) | [readystatechange](http://www.w3.org/TR/html5/dom.html#event-readystatechange) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onredo** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onredo) | redo event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onreset** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onreset) | reset event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onresize** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onresize) | resize event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onscroll** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onscroll) | scroll event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onscroll** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onscroll) | scroll event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onseeked** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onseeked) | [seeked](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-seeked) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onseeking** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onseeking) | [seeking](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-seeking) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onselect** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onselect) | select event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onshow** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onshow) | show event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onstalled** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onstalled) | [stalled](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-stalled) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onstorage** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onstorage) | storage event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onsubmit** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onsubmit) | submit event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onsuspend** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onsuspend) | [suspend](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-suspend) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **ontimeupdate** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-ontimeupdate) | [timeupdate](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-timeupdate) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onundo** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onundo) | undo event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onunload** | [body](http://www.w3.org/TR/html5/webappapis.html#handler-window-onunload) | unload event handler for [Window](http://www.w3.org/TR/html5/browsers.html#window) object | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onvolumechange** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onvolumechange) | [volumechange](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-volumechange) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |
| **onwaiting** | [HTML elements](http://www.w3.org/TR/html5/webappapis.html#handler-onwaiting) | [waiting](http://www.w3.org/TR/html5/the-iframe-element.html#event-media-waiting) event handler | [Event handler content attribute](http://www.w3.org/TR/html5/webappapis.html#event-handler-content-attributes) |

### Interfaces

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| List of interfaces for elements | |
| --- | --- |
| **Element(s)** | **Interface(s)** |
| [a](http://www.w3.org/TR/html5/text-level-semantics.html#the-a-element) | [HTMLAnchorElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlanchorelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [abbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-abbr-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [address](http://www.w3.org/TR/html5/sections.html#the-address-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [area](http://www.w3.org/TR/html5/the-map-element.html#the-area-element) | [HTMLAreaElement](http://www.w3.org/TR/html5/the-map-element.html#htmlareaelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [article](http://www.w3.org/TR/html5/sections.html#the-article-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [aside](http://www.w3.org/TR/html5/sections.html#the-aside-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [audio](http://www.w3.org/TR/html5/the-iframe-element.html#the-audio-element) | [HTMLAudioElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlaudioelement) : [HTMLMediaElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlmediaelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [b](http://www.w3.org/TR/html5/text-level-semantics.html#the-b-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [base](http://www.w3.org/TR/html5/semantics.html#the-base-element) | [HTMLBaseElement](http://www.w3.org/TR/html5/semantics.html#htmlbaseelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [bdi](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdi-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [bdo](http://www.w3.org/TR/html5/text-level-semantics.html#the-bdo-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [blockquote](http://www.w3.org/TR/html5/grouping-content.html#the-blockquote-element) | [HTMLQuoteElement](http://www.w3.org/TR/html5/grouping-content.html#htmlquoteelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [body](http://www.w3.org/TR/html5/sections.html#the-body-element) | [HTMLBodyElement](http://www.w3.org/TR/html5/sections.html#htmlbodyelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [br](http://www.w3.org/TR/html5/text-level-semantics.html#the-br-element) | [HTMLBRElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlbrelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [button](http://www.w3.org/TR/html5/the-button-element.html#the-button-element) | [HTMLButtonElement](http://www.w3.org/TR/html5/the-button-element.html#htmlbuttonelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [canvas](http://www.w3.org/TR/html5/the-canvas-element.html#the-canvas-element) | [HTMLCanvasElement](http://www.w3.org/TR/html5/the-canvas-element.html#htmlcanvaselement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [caption](http://www.w3.org/TR/html5/tabular-data.html#the-caption-element) | [HTMLTableCaptionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecaptionelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [cite](http://www.w3.org/TR/html5/text-level-semantics.html#the-cite-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [code](http://www.w3.org/TR/html5/text-level-semantics.html#the-code-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [col](http://www.w3.org/TR/html5/tabular-data.html#the-col-element) | [HTMLTableColElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecolelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [colgroup](http://www.w3.org/TR/html5/tabular-data.html#the-colgroup-element) | [HTMLTableColElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecolelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [command](http://www.w3.org/TR/html5/interactive-elements.html#the-command-element) | [HTMLCommandElement](http://www.w3.org/TR/html5/interactive-elements.html#htmlcommandelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [datalist](http://www.w3.org/TR/html5/the-button-element.html#the-datalist-element) | [HTMLDataListElement](http://www.w3.org/TR/html5/the-button-element.html#htmldatalistelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [dd](http://www.w3.org/TR/html5/grouping-content.html#the-dd-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [del](http://www.w3.org/TR/html5/edits.html#the-del-element) | [HTMLModElement](http://www.w3.org/TR/html5/edits.html#htmlmodelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [details](http://www.w3.org/TR/html5/interactive-elements.html#the-details-element) | [HTMLDetailsElement](http://www.w3.org/TR/html5/interactive-elements.html#htmldetailselement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [div](http://www.w3.org/TR/html5/grouping-content.html#the-div-element) | [HTMLDivElement](http://www.w3.org/TR/html5/grouping-content.html#htmldivelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [dl](http://www.w3.org/TR/html5/grouping-content.html#the-dl-element) | [HTMLDListElement](http://www.w3.org/TR/html5/grouping-content.html#htmldlistelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [dt](http://www.w3.org/TR/html5/grouping-content.html#the-dt-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [em](http://www.w3.org/TR/html5/text-level-semantics.html#the-em-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element) | [HTMLEmbedElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlembedelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [fieldset](http://www.w3.org/TR/html5/forms.html#the-fieldset-element) | [HTMLFieldSetElement](http://www.w3.org/TR/html5/forms.html#htmlfieldsetelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [figcaption](http://www.w3.org/TR/html5/grouping-content.html#the-figcaption-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [figure](http://www.w3.org/TR/html5/grouping-content.html#the-figure-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [footer](http://www.w3.org/TR/html5/sections.html#the-footer-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [form](http://www.w3.org/TR/html5/forms.html#the-form-element) | [HTMLFormElement](http://www.w3.org/TR/html5/forms.html#htmlformelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [head](http://www.w3.org/TR/html5/semantics.html#the-head-element) | [HTMLHeadElement](http://www.w3.org/TR/html5/semantics.html#htmlheadelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h1](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h2](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h3](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h4](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h5](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [h6](http://www.w3.org/TR/html5/sections.html#the-h1-h2-h3-h4-h5-and-h6-elements) | [HTMLHeadingElement](http://www.w3.org/TR/html5/sections.html#htmlheadingelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [header](http://www.w3.org/TR/html5/sections.html#the-header-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [hgroup](http://www.w3.org/TR/html5/sections.html#the-hgroup-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [hr](http://www.w3.org/TR/html5/grouping-content.html#the-hr-element) | [HTMLHRElement](http://www.w3.org/TR/html5/grouping-content.html#htmlhrelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [html](http://www.w3.org/TR/html5/semantics.html#the-html-element) | [HTMLHtmlElement](http://www.w3.org/TR/html5/semantics.html#htmlhtmlelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [i](http://www.w3.org/TR/html5/text-level-semantics.html#the-i-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [iframe](http://www.w3.org/TR/html5/the-iframe-element.html#the-iframe-element) | [HTMLIFrameElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmliframeelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element) | [HTMLImageElement](http://www.w3.org/TR/html5/embedded-content-1.html#htmlimageelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [input](http://www.w3.org/TR/html5/the-input-element.html#the-input-element) | [HTMLInputElement](http://www.w3.org/TR/html5/the-input-element.html#htmlinputelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [ins](http://www.w3.org/TR/html5/edits.html#the-ins-element) | [HTMLModElement](http://www.w3.org/TR/html5/edits.html#htmlmodelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [kbd](http://www.w3.org/TR/html5/text-level-semantics.html#the-kbd-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [keygen](http://www.w3.org/TR/html5/the-button-element.html#the-keygen-element) | [HTMLKeygenElement](http://www.w3.org/TR/html5/the-button-element.html#htmlkeygenelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [label](http://www.w3.org/TR/html5/forms.html#the-label-element) | [HTMLLabelElement](http://www.w3.org/TR/html5/forms.html#htmllabelelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [legend](http://www.w3.org/TR/html5/forms.html#the-legend-element) | [HTMLLegendElement](http://www.w3.org/TR/html5/forms.html#htmllegendelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [li](http://www.w3.org/TR/html5/grouping-content.html#the-li-element) | [HTMLLIElement](http://www.w3.org/TR/html5/grouping-content.html#htmllielement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [link](http://www.w3.org/TR/html5/semantics.html#the-link-element) | [HTMLLinkElement](http://www.w3.org/TR/html5/semantics.html#htmllinkelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [map](http://www.w3.org/TR/html5/the-map-element.html#the-map-element) | [HTMLMapElement](http://www.w3.org/TR/html5/the-map-element.html#htmlmapelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [mark](http://www.w3.org/TR/html5/text-level-semantics.html#the-mark-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [meter](http://www.w3.org/TR/html5/the-button-element.html#the-meter-element) | [HTMLMeterElement](http://www.w3.org/TR/html5/the-button-element.html#htmlmeterelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [nav](http://www.w3.org/TR/html5/sections.html#the-nav-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [noscript](http://www.w3.org/TR/html5/scripting-1.html#the-noscript-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [object](http://www.w3.org/TR/html5/the-iframe-element.html#the-object-element) | [HTMLObjectElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlobjectelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [ol](http://www.w3.org/TR/html5/grouping-content.html#the-ol-element) | [HTMLOListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlolistelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [optgroup](http://www.w3.org/TR/html5/the-button-element.html#the-optgroup-element) | [HTMLOptGroupElement](http://www.w3.org/TR/html5/the-button-element.html#htmloptgroupelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [option](http://www.w3.org/TR/html5/the-button-element.html#the-option-element) | [HTMLOptionElement](http://www.w3.org/TR/html5/the-button-element.html#htmloptionelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [output](http://www.w3.org/TR/html5/the-button-element.html#the-output-element) | [HTMLOutputElement](http://www.w3.org/TR/html5/the-button-element.html#htmloutputelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [p](http://www.w3.org/TR/html5/grouping-content.html#the-p-element) | [HTMLParagraphElement](http://www.w3.org/TR/html5/grouping-content.html#htmlparagraphelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [param](http://www.w3.org/TR/html5/the-iframe-element.html#the-param-element) | [HTMLParamElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlparamelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [pre](http://www.w3.org/TR/html5/grouping-content.html#the-pre-element) | [HTMLPreElement](http://www.w3.org/TR/html5/grouping-content.html#htmlpreelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [progress](http://www.w3.org/TR/html5/the-button-element.html#the-progress-element) | [HTMLProgressElement](http://www.w3.org/TR/html5/the-button-element.html#htmlprogresselement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [q](http://www.w3.org/TR/html5/text-level-semantics.html#the-q-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [rp](http://www.w3.org/TR/html5/text-level-semantics.html#the-rp-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [rt](http://www.w3.org/TR/html5/text-level-semantics.html#the-rt-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [ruby](http://www.w3.org/TR/html5/text-level-semantics.html#the-ruby-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [s](http://www.w3.org/TR/html5/text-level-semantics.html#the-s-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [samp](http://www.w3.org/TR/html5/text-level-semantics.html#the-samp-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [section](http://www.w3.org/TR/html5/sections.html#the-section-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [select](http://www.w3.org/TR/html5/the-button-element.html#the-select-element) | [HTMLSelectElement](http://www.w3.org/TR/html5/the-button-element.html#htmlselectelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [small](http://www.w3.org/TR/html5/text-level-semantics.html#the-small-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [source](http://www.w3.org/TR/html5/the-iframe-element.html#the-source-element) | [HTMLSourceElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlsourceelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [span](http://www.w3.org/TR/html5/text-level-semantics.html#the-span-element) | [HTMLSpanElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmlspanelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [strong](http://www.w3.org/TR/html5/text-level-semantics.html#the-strong-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [style](http://www.w3.org/TR/html5/semantics.html#the-style-element) | [HTMLStyleElement](http://www.w3.org/TR/html5/semantics.html#htmlstyleelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [sub](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [summary](http://www.w3.org/TR/html5/interactive-elements.html#the-summary-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [sup](http://www.w3.org/TR/html5/text-level-semantics.html#the-sub-and-sup-elements) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [table](http://www.w3.org/TR/html5/tabular-data.html#the-table-element) | [HTMLTableElement](http://www.w3.org/TR/html5/tabular-data.html#htmltableelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [tbody](http://www.w3.org/TR/html5/tabular-data.html#the-tbody-element) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [td](http://www.w3.org/TR/html5/tabular-data.html#the-td-element) | [HTMLTableDataCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltabledatacellelement) : [HTMLTableCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecellelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [textarea](http://www.w3.org/TR/html5/the-button-element.html#the-textarea-element) | [HTMLTextAreaElement](http://www.w3.org/TR/html5/the-button-element.html#htmltextareaelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [tfoot](http://www.w3.org/TR/html5/tabular-data.html#the-tfoot-element) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [th](http://www.w3.org/TR/html5/tabular-data.html#the-th-element) | [HTMLTableHeaderCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltableheadercellelement) : [HTMLTableCellElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablecellelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [thead](http://www.w3.org/TR/html5/tabular-data.html#the-thead-element) | [HTMLTableSectionElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablesectionelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [time](http://www.w3.org/TR/html5/text-level-semantics.html#the-time-element) | [HTMLTimeElement](http://www.w3.org/TR/html5/text-level-semantics.html#htmltimeelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [title](http://www.w3.org/TR/html5/semantics.html#the-title-element) | [HTMLTitleElement](http://www.w3.org/TR/html5/semantics.html#htmltitleelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [tr](http://www.w3.org/TR/html5/tabular-data.html#the-tr-element) | [HTMLTableRowElement](http://www.w3.org/TR/html5/tabular-data.html#htmltablerowelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [track](http://www.w3.org/TR/html5/the-iframe-element.html#the-track-element) | [HTMLTrackElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmltrackelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [u](http://www.w3.org/TR/html5/text-level-semantics.html#the-u-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [ul](http://www.w3.org/TR/html5/grouping-content.html#the-ul-element) | [HTMLUListElement](http://www.w3.org/TR/html5/grouping-content.html#htmlulistelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [var](http://www.w3.org/TR/html5/text-level-semantics.html#the-var-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [video](http://www.w3.org/TR/html5/the-iframe-element.html#the-video-element) | [HTMLVideoElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlvideoelement) : [HTMLMediaElement](http://www.w3.org/TR/html5/the-iframe-element.html#htmlmediaelement) : [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |
| [wbr](http://www.w3.org/TR/html5/text-level-semantics.html#the-wbr-element) | [HTMLElement](http://www.w3.org/TR/html5/elements.html#htmlelement) |

### Events

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| List of events | | |
| --- | --- | --- |
| **Event** | **Interface** | **Description** |
| DOMContentLoaded | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) once it and its scripts have loaded, without waiting for other subresources |
| abort | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the download was aborted by the user |
| afterprint | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) after printing |
| beforeprint | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) before printing |
| beforeunload | [BeforeUnloadEvent](http://www.w3.org/TR/html5/history.html#beforeunloadevent) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the page is about to be unloaded, in case the page would like to show a warning prompt |
| blur | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at nodes losing focus |
| change | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at controls when the user commits a value change |
| [click](http://www.w3.org/TR/html5/infrastructure.html#event-click) | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at an element before its [activation behavior](http://www.w3.org/TR/html5/content-models.html#activation-behavior) is run |
| contextmenu | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at elements when the user requests their context menu |
| error | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at elements when network and script errors occur |
| focus | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at nodes gaining focus |
| [hashchange](http://www.w3.org/TR/html5/history.html#event-hashchange) | [HashChangeEvent](http://www.w3.org/TR/html5/history.html#hashchangeevent) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the fragment identifier part of [the document's current address](http://www.w3.org/TR/html5/dom.html#the-document-s-current-address) changes |
| input | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at controls when the user changes the value |
| invalid | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at controls during form validation if they do not satisfy their constraints |
| load | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the document has finished loading; fired at an element containing a resource (e.g. [img](http://www.w3.org/TR/html5/embedded-content-1.html#the-img-element), [embed](http://www.w3.org/TR/html5/the-iframe-element.html#the-embed-element)) when its resource has finished loading |
| message | MessageEvent | Fired at an object when the object receives a message |
| [offline](http://www.w3.org/TR/html5/offline.html#event-offline) | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the network connections fails |
| [online](http://www.w3.org/TR/html5/offline.html#event-online) | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the network connections returns |
| [pagehide](http://www.w3.org/TR/html5/history.html#event-pagehide) | [PageTransitionEvent](http://www.w3.org/TR/html5/history.html#pagetransitionevent) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the page's entry in the [session history](http://www.w3.org/TR/html5/history.html#session-history) stops being the [current entry](http://www.w3.org/TR/html5/history.html#current-entry) |
| [pageshow](http://www.w3.org/TR/html5/history.html#event-pageshow) | [PageTransitionEvent](http://www.w3.org/TR/html5/history.html#pagetransitionevent) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the page's entry in the [session history](http://www.w3.org/TR/html5/history.html#session-history) becomes the [current entry](http://www.w3.org/TR/html5/history.html#current-entry) |
| [popstate](http://www.w3.org/TR/html5/history.html#event-popstate) | [PopStateEvent](http://www.w3.org/TR/html5/history.html#popstateevent) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) when the user navigates the [session history](http://www.w3.org/TR/html5/history.html#session-history) |
| [readystatechange](http://www.w3.org/TR/html5/dom.html#event-readystatechange) | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Document](http://www.w3.org/TR/html5/infrastructure.html#document) when it finishes parsing and again when all its subresources have finished loading |
| reset | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at a [form](http://www.w3.org/TR/html5/forms.html#the-form-element) element when it is [reset](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-form-reset) |
| show | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at a [menu](http://www.w3.org/TR/html5/interactive-elements.html#the-menu-element) element when it is shown as a context menu |
| submit | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at a [form](http://www.w3.org/TR/html5/forms.html#the-form-element) element when it is [submitted](http://www.w3.org/TR/html5/association-of-controls-and-forms.html#concept-form-submit) |
| unload | [Event](http://www.w3.org/TR/html5/infrastructure.html#event) | Fired at the [Window](http://www.w3.org/TR/html5/browsers.html#window) object when the page is going away |

See also [media element events](http://www.w3.org/TR/html5/the-iframe-element.html#mediaevents), [application cache events](http://www.w3.org/TR/html5/offline.html#appcacheevents), and [drag-and-drop events](http://www.w3.org/TR/html5/dnd.html#dndevents).