

Tales from the Trenches

Battling Browser Bugs for “Fun” and (Non-)Profit

Roan Kattouw

Web development used to be
HARD

```
var remove = document.  
    getElementsByClassName( 'removeMe' );  
for ( var i = 0; i < remove.length; i++ ) {  
    remove[i].parentNode.removeChild(  
        remove[i]  
    );  
}
```

```
$( '.removeMe' ).remove();
```



> jqXHR

▶ *Object {readyState: 0, getResponseHeader: function, setRequestHeader: function, overrideMimeType: function, ...}*

> \$(' .selected')

[▶ *<li id="ca-nstab-main" class="selected">...*,
▶ *<li id="ca-view" class="selected">...*]

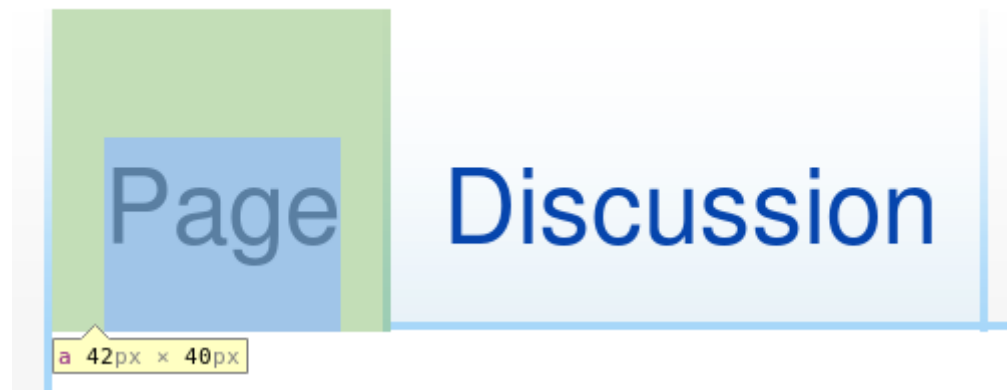
> \$('body').css('background', 'red')

```
4771 deferred.promise(jqXHR).complete = c
4772 jqXHR.success = jqXHR.done;
4773 jqXHR.error = jqXHR.fail;
4774 s.url = ((url || s.url || ajaxLocati
4775 s.type = options.method || options.t
4776 s.dataTypes = jQuery.trim(s.dataTypee
4777 if (s.crossDomain == null) {
4778     parts = rurl.exec(s.url.toLowerCase
4779     s.crossDomain = !(parts && (par
4780 }
4781 if (s.data && s.processData && typec
4782     s.data = jQuery.param(s.data, s.
4783 }
4784 inspectPrefiltersOrTransports(prefil
4785 if (state === 2) {
4786
```

{ } Line 4772, Column 1

▼ Call Stack

%2Cmedi...2CSpinner%7Cjq
jQuery.extend.ajax
%2Cmedi...2CSpinner%7Cjq
addScript
%2Cmedi...2CSpinner%7Cjq
doRequest
%2Cmedi...2CSpinner%7Cjq
mw.loader.work
%2Cmedi...2CSpinner%7Cjq
request
%2Cmedi...2CSpinner%7Cjq
mw.loader.using



- ▼ ``
 - ▼ `<li id="ca-nstab-main" class="selected">`
 - ▼ ``
 - `<a href="/wiki/VisualEditor" title="V`
`[alt-shift-c]" accesskey="c">Page`
 - ``
 - ``
 - ▼ `<li id="ca-talk">`

<title>W</title>

<title>We</title>

<title>Wel</title>

<title>Welc</title>

<title>Welco</title>

<title>Welcom</title>

<title>Welcome</title>


```
$( 'body' ).animate( {  
    'scrollTop': 1000  
} );
```

```
.button {  
  border: 1px #c9c9c9 solid;  
  border-radius: 0.3em;  
  transition: border-color  
    100ms ease-in-out;  
}
```

```
.button:hover {  
  border-color: #aaaaaa;  
}
```

The modern web is **EASY**



HTML



CSS



Browsers used to be
GARBAGE

HealthCare.gov

Learn

Get Insurance

Log in

Individuals & Families

Small Businesses

All Topics

Still need health

Still need health coverage?

Find out if you qualify for a
Special Enrollment Period or Medicaid/CHIP



Report income or life changes



Use your new coverage



Small businesses: Apply any time



Learn about fees & exemptions



HEALTH INSURANCE BLOG

16 From Coverage to Care: A
JUNE roadmap for using your

TOP CONTENT

Getting coverage outside Open Enrollment

CONNECT WITH US

Share Your Story

Modern browsers
JUST WORK

Well...
not **REALLY**

are

Browsers ~~used to be~~

GARBAGE

Modern browsers

~~JUST WORK~~

kind of

in common cases

Modern browsers

are incredibly complex

Modern browsers

have LOTS of bugs

Let's talk about Chrome

Interactive box-shadow

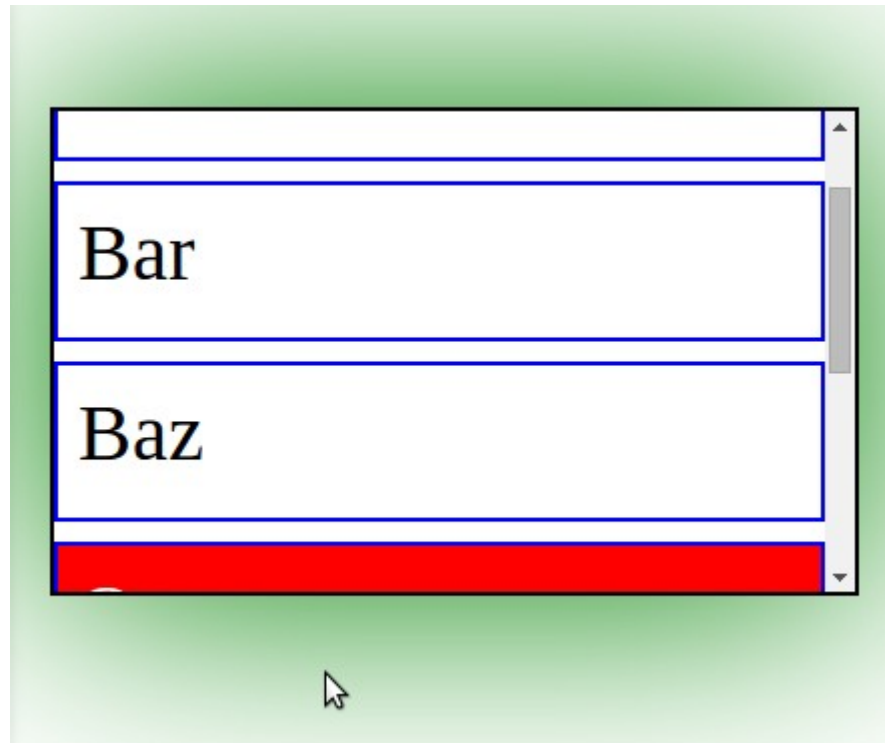
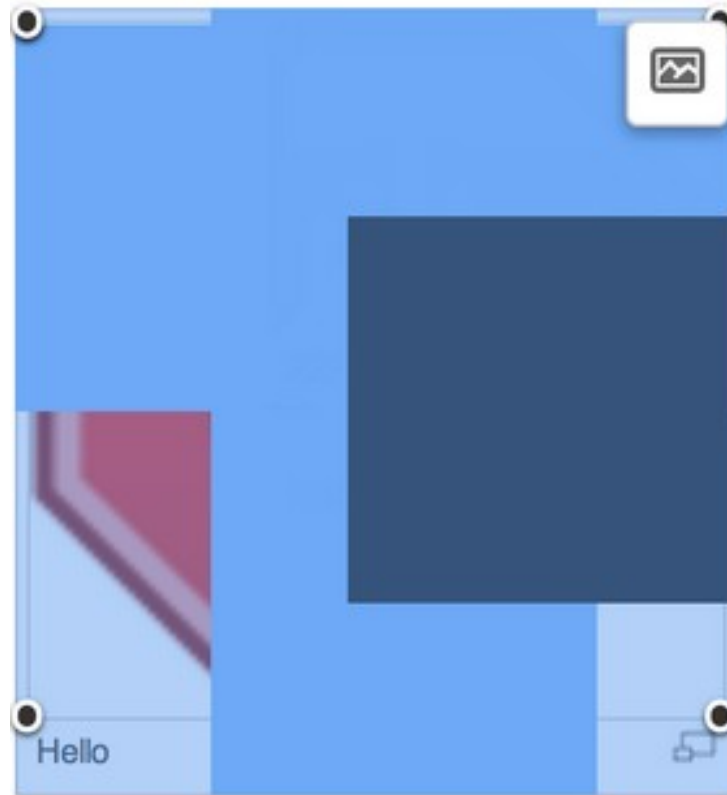


Image rendering is hard



<https://code.google.com/p/chromium/issues/detail?id=308046>

Font rendering is harder

[3.3"Red Dragon" Mars mission concept](#)

[4 Other Contracts](#)

[4.1 Launch market competition and pricing pressure](#)

[5 Commercial and government launch contracts summary](#)

[6 Space vehicles](#)

[6.1 Falcon launch vehicles](#)

[6.2 Dragon](#)

[6.3 Other concepts under development](#)

[7 Rocket engines](#)

[8 See also](#)

[9 References](#)

[10 External links](#)

Argentina's mid-term election Cristina's come-uppance



President Fernández should build bridges to her opponents—or risk leaving office early

POWER in Argentina is like mercury. It drains swiftly from troubled leaders, flooding towards their most likely successors. That is the prospect facing the president, Cristina Fernández de Kirchner, after a mid-term congressional election on October 27th. Having driven her country's economy close to a precipice, she still has two more years in office. They look as if they will be bumpy ones—even assuming she makes a full recovery from the head injury that prevented her campaigning during the last four weeks.

On paper, Ms Fernández did not fare badly in the election. She retained a narrow majority in Congress. Her opponents are divided three ways. Her group within Argentina's all-embracing Peronist movement remains the country's largest single political force. But it won only 33% of the vote, down from the 54% she secured in winning a second term in 2011. In politically crucial Buenos Aires province, it

was trounced by a rival Peronist list led by Sergio Massa, who served as Ms Fernández's cabinet chief before breaking with her.

The election has killed off any lingering hope the president might have had of lifting term limits to allow her to run again in 2015, a measure that would need the backing of two-thirds of Congress. And she has no obvious successor. To a more consensual leader, none of this would matter much. But Ms Fernández and her late husband and predecessor, Néstor Kirchner, have ruled Argentina since 2003 through permanent confrontation—with bondholders, the IMF, political opponents, the media and, lately, the judiciary. Their main weapon was a booming economy. They were fortunate to preside over a surge in the world prices of farm exports from the bountiful Pampas. They shovelled the proceeds into public employment, loss-making state companies and welfare

Why respect CSS3 selection colors?

Select from here...

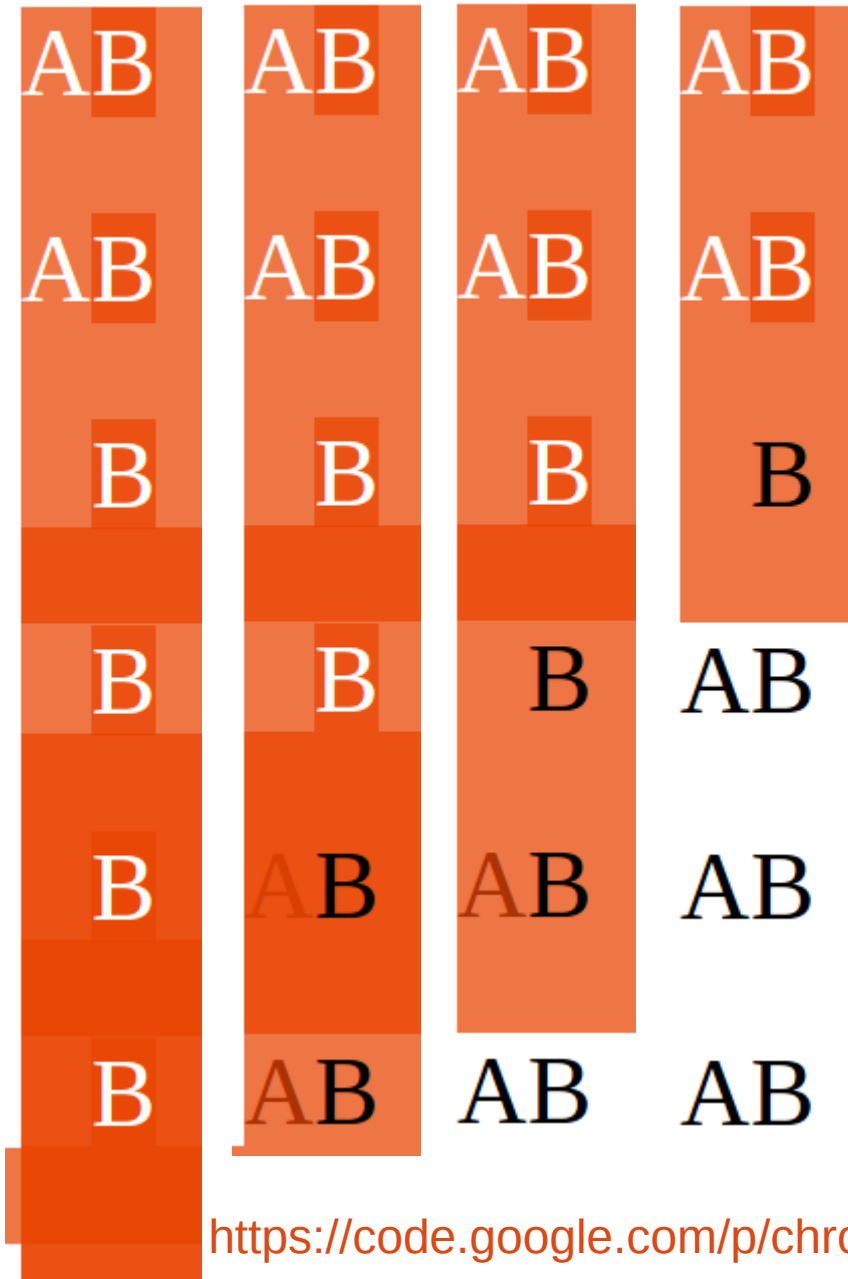
1. One
2. Two
3. Three

...to here.

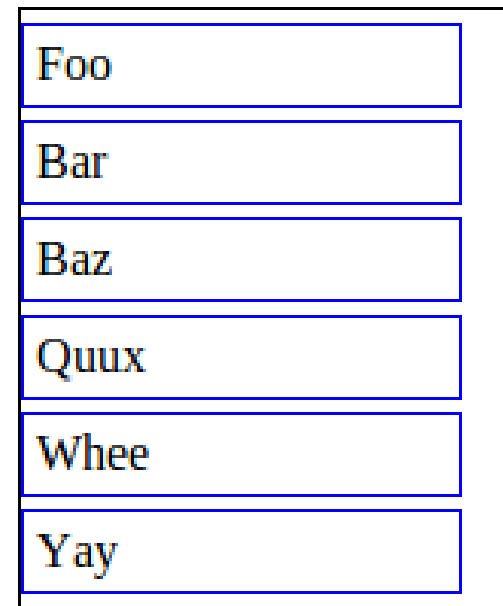
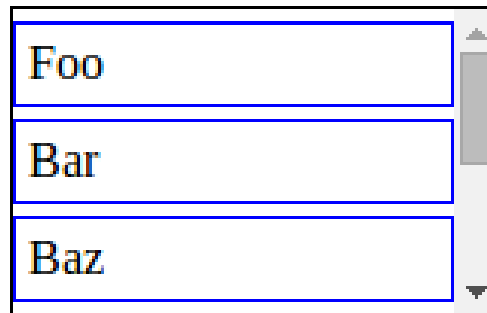
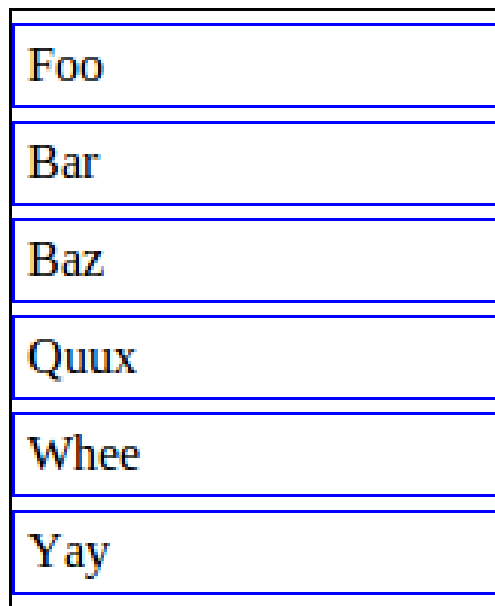
Because selection is also hard

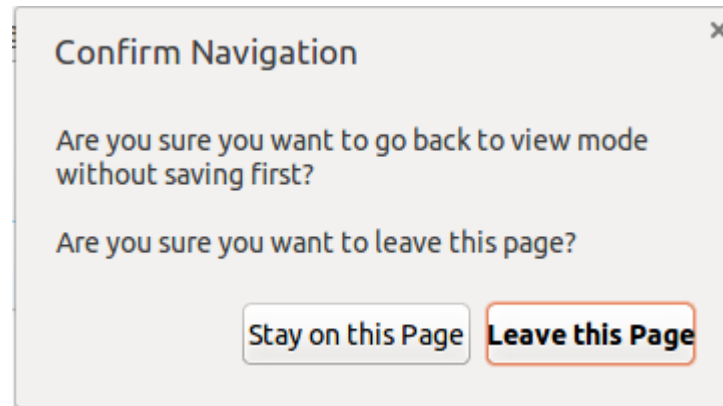
Select this text...and
this text will
actually get
selected

...very hard actually



Dead scrollbars deserve memorials

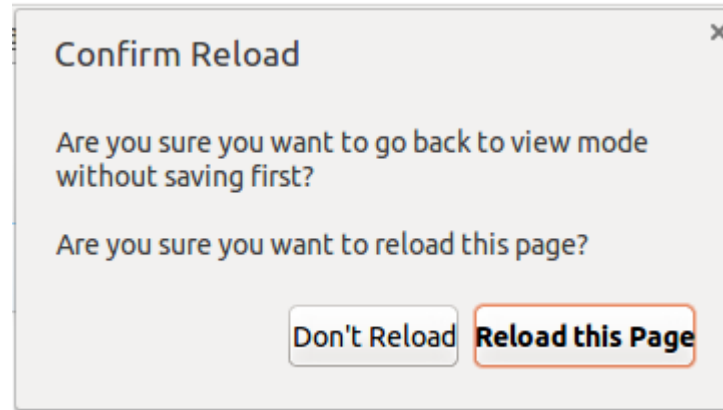




onbeforeunload dialog

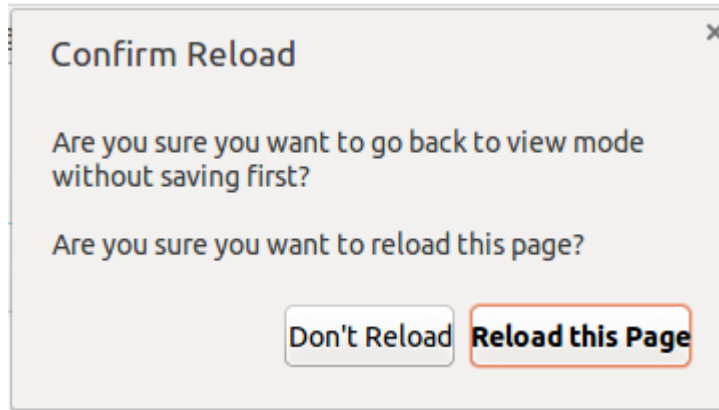
Pretty standard

But what if you **reload** instead?



There's a dialog for that!

Now click **Reload this page**
Then **close the tab**



Same dialog

But I tried to **close** the tab...

Reload this Page: closes tab (?)

Don't Reload: continues reload (!!)

Saga #1
splice()

Inserting items

```
> a = [ 'a', 'b', 'c', 'd' ];  
["a", "b", "c", "d"]
```

```
> a.splice( 2, 0, 'x', 'y' ); a;  
["a", "b", "x", "y", "c", "d"]
```

What if you have an array of items?

```
> a = [ 'a', 'b', 'c', 'd' ];  
["a", "b", "c", "d"]
```

```
> b = [ 'x', 'y', 'z' ];  
["x", "y", "z"]
```

```
> a.splice.apply( a, [2, 0].concat( b ) ); a;  
["a", "b", "x", "y", "z", "c", "d"]
```

But what if you have a **LOT**?

```
> a = [ 'a', 'b', 'c', 'd' ];  
["a", "b", "c", "d"]
```

```
> b = new Array( 500 );  
▶ Array[500]
```

```
> a.splice.apply( a, [2, 0].concat( b ) ); a;  
▶ Array[504]
```

How far can you go?

- What happens if you pass too many arguments?
- How many is “too many”?

ECMAScript spec

Says nothing

Chrome

131072 ($=2^{17}$)

RangeError: Maximum call stack
size exceeded

Firefox

524288 (=2¹⁹)

RangeError: arguments array
passed to Function.prototype.apply
is too large

Opera 12 and below

2097152 (=2²¹)

Error: Function.prototype.apply:
argArray is too large

Safari

65536 ($=2^{16}$)

RangeError: Maximum call stack
size exceeded

IE10+

262144 ($=2^{18}$)

Error: Out of stack space

IE9 and below

No apparent limit

Got up to 33554432 ($=2^{25}$)

Error: Out of memory (!!)

Solution:
splice.apply() in batches
of 1024

Note assumption:
no crash $\equiv \equiv \equiv$ correctness

Basic operations would
never be implemented
incorrectly, right?

```
> a = []; a[6] = 'x'; a;
```

```
[undefined × 6, "x"]
```

```
> a.splice( 7, 0, 'y' ); a;
```

```
[undefined × 6, "x", "y"]
```

```
>>> a = []; a[6] = 'x'; a;
```

```
⊕ Array ["x"]
```

```
>>> a.splice( 7, 0, 'y' ); a;
```

```
⊖ Array
```

```
  6 "x"
```

```
  7 "y"
```



```
> a = []; a[256] = 'x'; a;
▶ Array[257]
> a.splice( 257, 0, 'y' ); a;
▼ Array[258] ⓘ
    256: "x"
    257: "y"
```

```
>>> a = []; a[256] = 'x'; a;
+ Array ["x"]
>>> a.splice( 257, 0, 'y' ); a;
- Array
  257 "y"
```

```
function isMyBrowserAPieceOfGarbage() {  
    var n = 256, a = [];  
    a[n] = 'a';  
    a.splice( n + 1, 0, 'b' );  
    return a[n] !== 'a';  
}
```

Let's talk about Firefox

Underline? Overline!



FIXED in Firefox 33
(current version is 30)

Unfollowable but active

Hello [world!](#) This [link here](#) is special.

Cursoring over “invisible” things

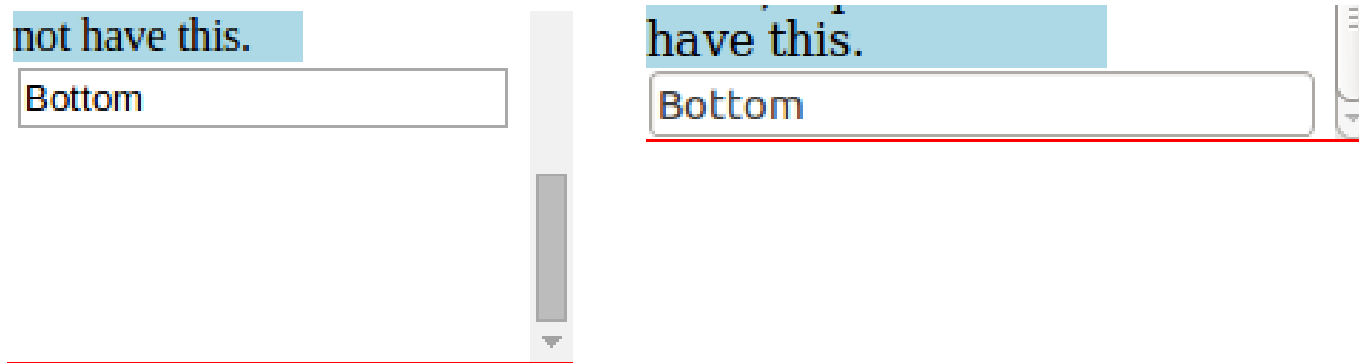
F|ooIMAGEBar

Fo|oIMAGEBar

Foo|IMAGEBar

FooIMAGEB|ar

Who needs bottom padding?

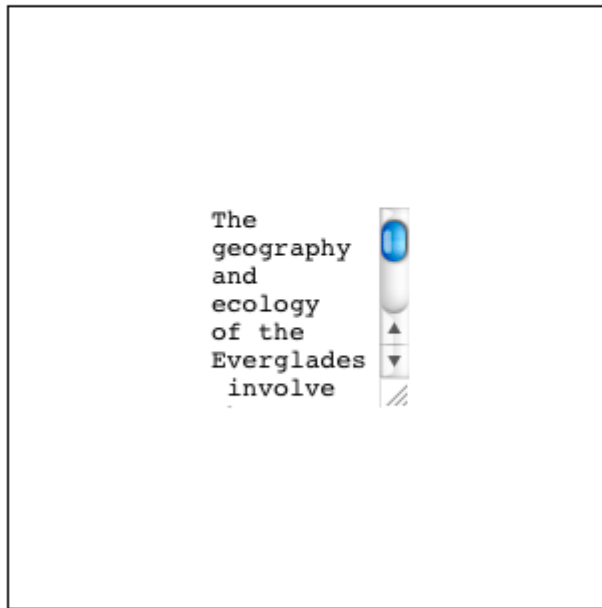


RESOLVED INVALID

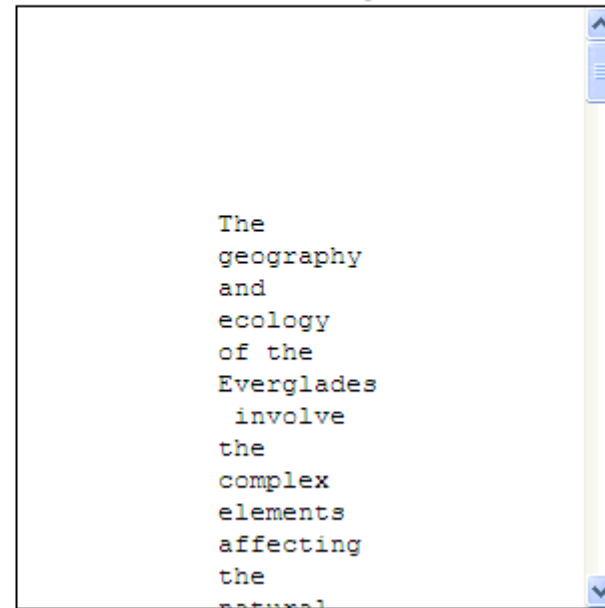
Textareas, is who!

```
<textarea style="width: 100px; height: 100px; padding: 100px; border: 1px solid black;">
```

Firefox



Internet Explorer



FIXED in FF 30 (2014-06-10)
Filed 2002-07-16 (!)

Saga #2

HTML parsing

Input: HTML string
Desired output: DOM

This is *easy* for **fragments**

```
> html = '<p>Hello</p><pre>World</pre>';  
"<p>Hello</p><pre>World</pre>"  
  
> $.parseHTML( html );  
[<p>Hello</p>, <pre>World</pre>]  
  
> $('<div>').html( html );  
[ ▼ <div> ]  
    <p>Hello</p>  
    <pre>World</pre>  
    </div>
```

But I have a **document**

```
"<!DOCTYPE html>
<html prefix="dc: http://purl.org/c
http://mediawiki.org/rdf/"
about="http://www.mediawiki.org/wik
1044293"><head prefix="mwr:
http://www.mediawiki.org/wiki/Speci
property="mw:articleNamespace" cont
rel="dc:replaces" resource="mwr:rev
property="dc:modified" content="201
<meta about="mwr:user/35927" proper
```

iframe hack

```
function createDocument( html ) {  
  var newDocument, iframe;  
  iframe = document.createElement( 'iframe' );  
  document.body.appendChild( iframe );  
  newDocument = iframe.contentDocument,  
  newDocument.open(); .contentWindow.document  
  // Party like it's 1995! for IE8  
  newDocument.write( html );  
  newDocument.close();  
iframe.parentNode.removeChild( iframe );  
  return newDocument;  
}
```

*breaks in IE8
after yield*

createHTMLDocument()

```
function createDocument( html ) {
    var newDocument = document.implementation.
        createHTMLDocument( '' );

    // Regex the doctype and html tags out *barf*
    html = html.replace(
        /^\\s*(?:<!doctype[\\^>]*>)?\\s*<html[\\^>]*>/i,
        ''
    );
    html = html.replace( /<\\\/html>\\s*$/i, '' );

    newDocument.documentElement.innerHTML = html;
    return newDocument;
}
```


“We're not doing anything weird, we're doing exactly what the W3C says!”

The **DOMImplementation.createHTMLDocument()** method creates a new HTML [Document](#).

Syntax

```
document.implementation.createHTMLDocument(title);
```

Parameters

title

Optional

Is a [DOMString](#) containing the title to give the new HTML document.

DOMParser

```
function createDocument( html ) {  
    var parser = new DOMParser();  
    return parser.parseFromString(  
        html, 'text/html'  
    );  
}
```

DOMParser HTML support

- Firefox 12 (*April 2012*)
- IE 10 (*October 2012*)
- Chrome 30 (*October 2013*)
- Opera 17 (*October 2013*)
- Safari: no support

** It is currently unclear what the URL of the returned document should be.

Results for a test case:

	Gecko	Opera	Chrome
document.location	null		
document.URL	unsupported	unsupported	""
document.documentURI	Page URL	null	null

Anne van Kesteren suggests using the default, about:blank.

DOM serialization

doc . documentElement
 . outerHTML

<pre> parsing is weird

```
> div.innerHTML = '<pre>\n\nFoo</pre>';  
div.childNodes[0].childNodes[0];  
"  
Foo"
```

Note

*In the HTML syntax, a leading newline character immediately following the **pre** element start tag is stripped.*

<pre> serialization is broken

> `div.innerHTML = '<pre>\n\nFoo</pre>';`
`div.childNodes[0].childNodes[0];`

"

Foo"

> `div.innerHTML`

"<pre>

Foo</pre>"

>

Very broken

-
- > `div.innerHTML = div.innerHTML;`
`"<pre>`
`Foo</pre>"`

 - > `div.innerHTML = div.innerHTML;`
`"<pre>`
`Foo</pre>"`

 - > `div.innerHTML = div.innerHTML;`
`"<pre>Foo</pre>"`
-

```
function isMyBrowserAPieceOfGarbage() {  
    var div =  
        document.createElement( 'div' );  
    div.innerHTML = '<pre>\n\n</pre>';  
    return div.innerHTML ===  
        '<pre>\n</pre>';  
}
```

Broken in all browsers except...
Opera 12 and below

**Workaround:
add newlines to DOM
in the right places**

So browsers suck?

Browsers are still pretty
awesome

<http://krinkle.github.io/dom-ce/>