Hell is other browsers - Sartre

JavaScript Events

Peter-Paul Koch (ppk) http://quirksmode.org http://twitter.com/ppk Yahoo!, 23 April 2009

Event	IE 5.5	IE Ó	IE 7	IE8b1	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
blur		у	es		too many	almost	incom plete	almost	incom	plete	incomplete
When an element loses the focus.	• Fir	refox 2	fires to	oo many e	events in .	a variety (ofcircum	stances.			
	• Fir	refox 3	fires to	oo many e	events wh	en blurrin	ng the win	dow.			
	• Sat	fari and	l Opera	a don't sup	pport the	se events	on links a	nd/or for	m fields i	n all circu	ımstances.
	• Ko	nquer	or does	sn't suppo	rt these e	events on	the brows	ser windo	w.		
change		bu	iggy		y	es	ує	es	ує	es	yes
When a form field value changes.	• IE	has a s	erious	bug in its	handling	of this ev	ent on ch	eckboxes	and radio	os.	
click		у	es		y	es	ує	es	ує	es	yes
When a mousedown and mouseup event occur on the same element OR an element is activated by the keyboard.											
Event	IE 5.5	IE 6	IE 7	IE8bı	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
contextmenu		yes		minimal	yes	buggy	ує	es	n	o	no
When the user right-clicks to get the context menu.	Preven event.	eventing the default (i.e. preventing the context menu from appearing) is the whole point of this ent.									

Event	IE 5.5	IE 6	IE 7	IESpi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
blur					too many		incom plete		incom	plete	incomplete
When an element loses the focus.				oo many e							
	• Fir	efox 3	fires to	oo many e	vents wh	en blurrii	ng the wir	ndow.			
	• Saf	fari and	l Opera	don't sup	oport the	se events	on links a	and/or for	m fields i	n all circi	umstances.
	• Ko	nquero	or does	n't suppo	rt these e	events on	the brow	ser windo	w.		
											yes
When a form field value changes. http://qu click	ir		sn	100		of this of O r	100	doi	100	'ev	rents/
When a mousedown and mouseup event occur on the same element OR an element is activated by the keyboard.											
Event	IE 5.5	IE Ô	IE 7	IE8bi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
contextmenu				minimal	yes	buggy	<u>y</u>	es	n		ាត
When the user right-clicks to get the context menu.	Preven event.	ting th	e defau	ult (i.e. pre	eventing	the conte	xt menu i	from appe	aring) is t	he whole	point of this

IE 5.5 IE Ó IE 7 IESba

FF 3b5

3b5 Win

9.26 9.5b Konquer

incomplete

Today's program:

event.

Firefox 2 fires too many events in a variety of circumstances.

- Firefox 3 fires too many events when blurring the window.
- Safari and Opera don't support these events on links and/or form fields in all circumstances.

- the key events up or these events on the browser window.

the change event delegating the focus event first results of mobile event tests

event occur on the same element OR an element is activated by the keyboard.

Event	IE 5.5	IE Ó	IE 7	IE8bi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
contextmenu				minimal		buggy	¥.	95	:0	0	no
When the user right-clicks to get the context menu.	Prever	ting th	e defai	ılt (i.e. pre	venting	the conte	xt menu f	rom appe	aring) is t	he whole	point of this

The key events

keydown When a key is depressed. Repeats. keypress

keyup

keydown When a key is depressed. Repeats. keypress When a character key is depressed. Repeats. keyup

keydown When a key is depressed. Repeats. keypress When a *character* key is depressed. Repeats. keyup When a key is released.

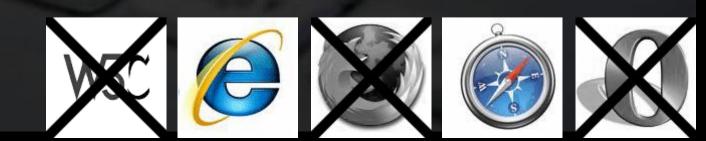
keydown and keypress

keydown only

Originally this theory was created by Microsoft.

Safari has copied it.

It's the only theory; Firefox and Opera just fire some random events. keydown When a key is depressed. Repeats. keypress When a character key is depressed. Repeats.



Two properties: keyCode and charCode

Two bits of data: - the key code - the character code

Obviously, having one property contain one bit of data and the other property the other

would be far too simple.

keyCode

onkeydown: key code
 onkeypress: character code



charCode

onkeydown: o onkeypress: character code



If you need the key:

el.onkeydown = function (e) {
 e = e || window.event;
 var realKey = e.keyCode;

If you need the key:

el.onkeydown = function (e) {
 e = e || window.event;
 var realKey = e.keyCode;



If you need the character:

el.onkeypress = function (e) {
 e = e || window.event;
 var char = e.keyCode || e.charCode;

If you need the character:

el.onkeypress = function (e) {
 e = e || window.event;
 var char = e.keyCode || e.charCode;



How can I prevent the default action?

el.onkeydown = function (e) {
 e = e || window.event;
 var key = e.keyCode;
 if (key is incorrect) {
 // cancel default action

How can I prevent the default action?

el.onkeydown = function (e) { e = e || window.event; var key = e.keyCode; if (key is incorrect) { // cancel default action













Traditional

O addEventListener(capture)

🔘 addEventListener (bubble)

Events-

The following events are registered: I change

chai	 ✓ form ✓ text 	

Miscellaneous-

Prevent default action

Gancel bubble

-Event properties-

Show event properties

show page contents

The change event fires when the value of a form field is changed.

This could be a very useful event; after all it fires only when the user actually changes something instead of whenever he focuses on a form field

Prevent default action

Cancel bubble

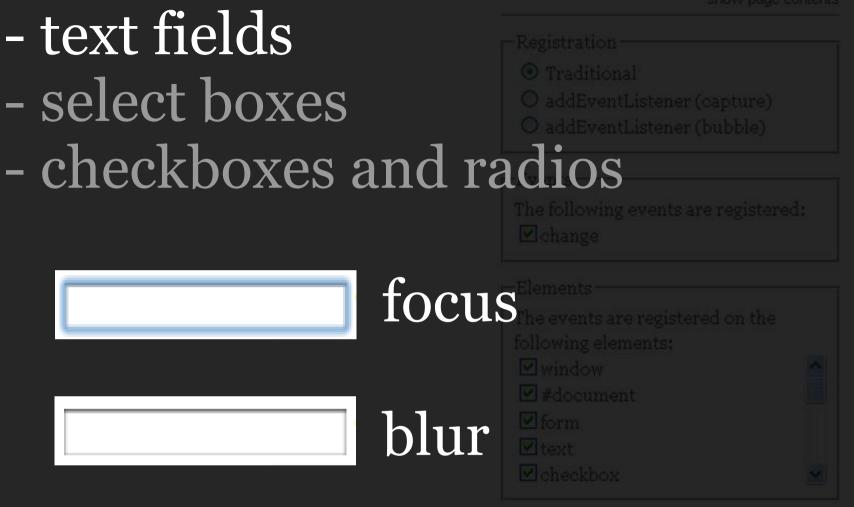
-Event properties-

Show event properties

- text fields - select boxes - checkboxes and radios

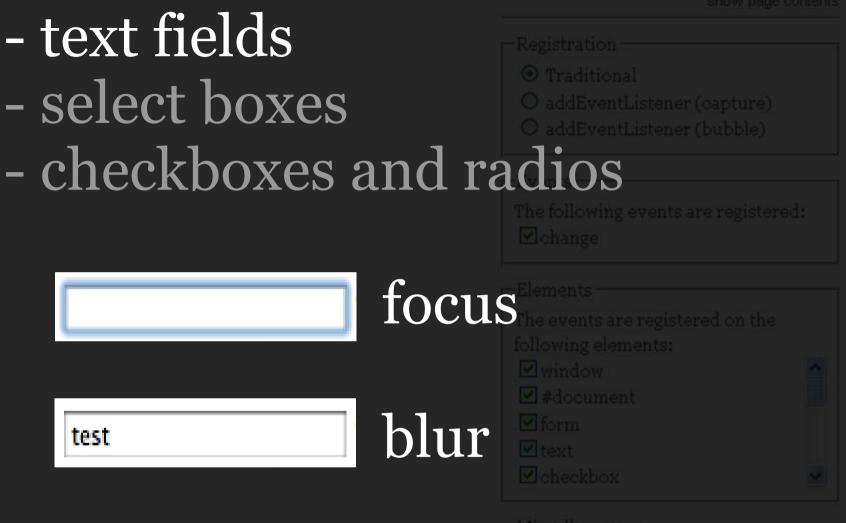
		e regis	tered:

following elements:	



No change event. The value hasn't been modified.

Show event properties



Change event. The value has been modified.





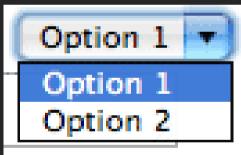






- text fields - select boxes - checkboxes and radios

Mouse:



Click on select

	are rej	gistered:	

following elements:	

- text fields - select boxes - checkboxes and radios Mouse: Option 1 Option 1 Option 1 Option 1 Option 2 Option 2

Click on new option CHANGE



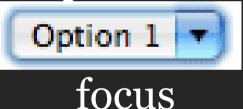






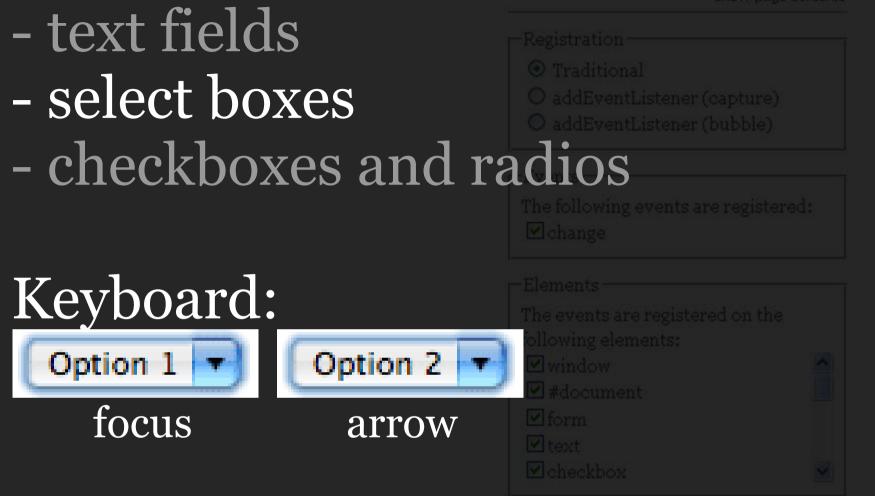
- text fields - select boxes - checkboxes and radios

Keyboard:



Focus on select

following elements:	



Arrow keys to move to other option CHANGE



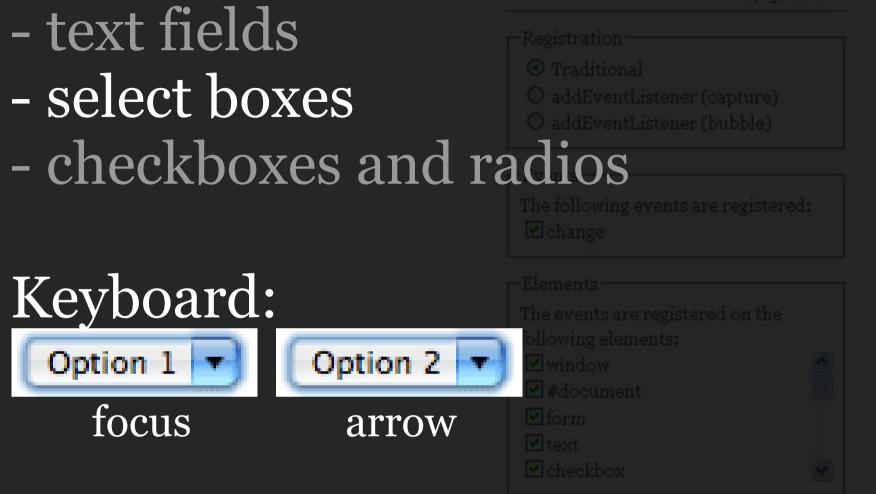
- text fields - select boxes - checkboxes and radios This is a BUG!

Arrow keys to move to other option CHANGE



properties

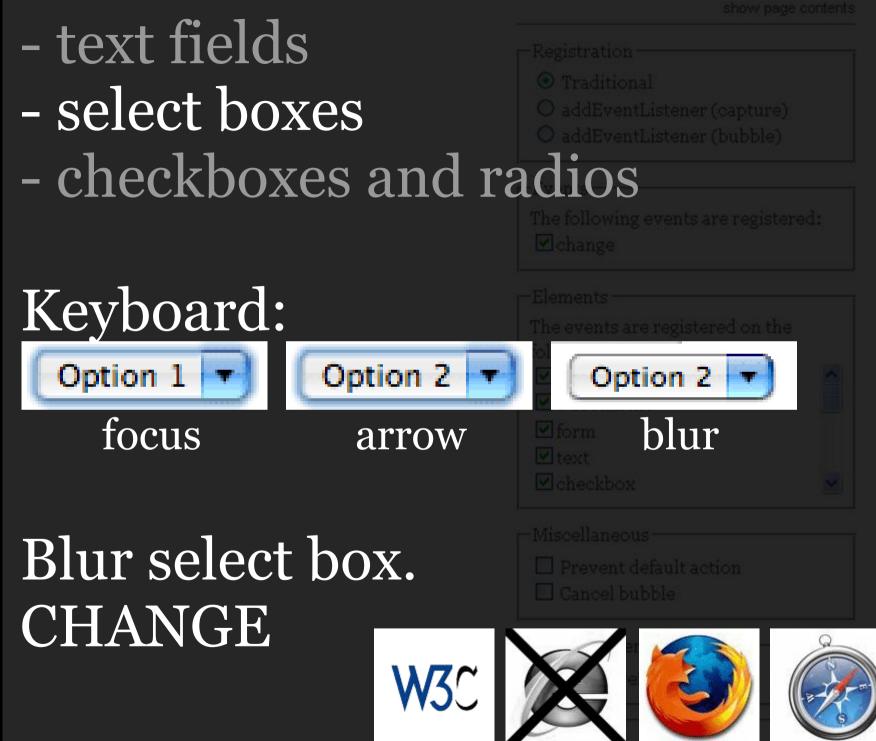




Arrow keys to move to other option

Event properties

Show event properties



- text fields - select boxes - checkboxes and radios

E	1	
	e 1	-

	• 1	
\mathbf{C}	l1CK	

Ine following events are registered. ☑ change	

CHANGE when the checked property changes.







text fields select boxes checkboxes and radios



click

 $\bullet \bullet \bullet$

The following events are registered: I change

following elements:	

-Miscellaneous-





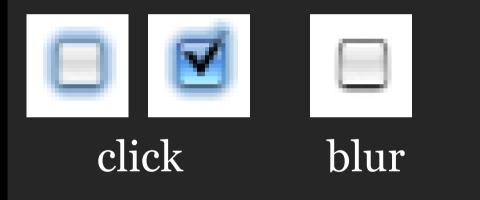






text fields select boxes checkboxes and radios

	registered:



following elements:	

CHANGE when the element loses the focus.









- text fields - select boxes - checkboxes and radios This is a BUG! CHANGE when the element loses the

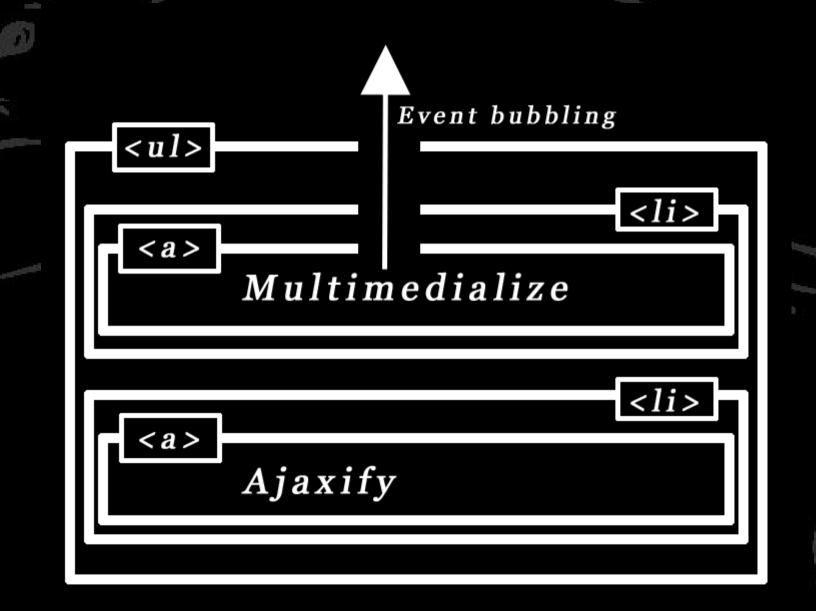




nt properties

Multimedialize Sound Java applets Ajaxify

Web 2.0Web 3.0Web 3.0Web 4.0b



The event bubbles up to the anyway.ion (dropdown) { dropdown.onmouseover = mouseOver; dropdown.onmouseout = mouseOut; So why not handle it at that level?

Saves a lot of event handlers.

var dropdown = { init: function (dropdown) { dropdown.onmouseover = mouseOver; dropdown.onmouseout = mouseOut;

Works in all browsers.





But suppose someone doesn't use a mouse at all,

but the keyboard

how does the menu fold out?

Device independence

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover = this.mouseOver;
 dropdown.onmouseout = this.mouseOut;

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover = this.mouseOver;
 dropdown.onmouseout = this.mouseOut;

Doesn't work without a mouse.

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover = this.mouseOver;
 dropdown.onmouseout = this.mouseOut;

We need events that tell us whether the user enters or leaves a link. focus and blur

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover =
 dropdown.onfocus = this.mouseOver;
 dropdown.onmouseout =
 dropdown.onblur = this.mouseOut;

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover =
 dropdown.onfocus = this.mouseOver;
 dropdown.onmouseout =
 dropdown.onblur = this.mouseOut;

Doesn't work.

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover =
 dropdown.onfocus = this.mouseOver;
 dropdown.onmouseout =
 dropdown.onblur = this.mouseOut;

Focus and blur don't bubble.

Two kinds of events:1) Mouse and key events2) Interface events

Two kinds of events:1) Mouse and key events2) Interface events

Fire when the user initiates a devicespecific action. mouseover, mouseout, click, keydown, keypress

Two kinds of events:1) Mouse and key events2) Interface events

In general they bubble.

Two kinds of events:1) Mouse and key events2) Interface events

Fire when a certain event takes place, regardless of how it was initialised. load, change, submit, focus, blur

Two kinds of events:1) Mouse and key events2) Interface events

In general they don't bubble.

```
var dropdown = {
    init: function (dropdown) {
        dropdown.onmouseover = this.mouseOver;
        dropdown.onmouseout = this.mouseOut;
        var x = dropdown.getElementsByTagName('a');
        for (var i=0;i<x.length;i++) {
            x[i].onfocus = this.mouseOver;
            x[i].onblur = this.mouseOut;</pre>
```

So we're stuck with setting a focus and blur event on every single link.

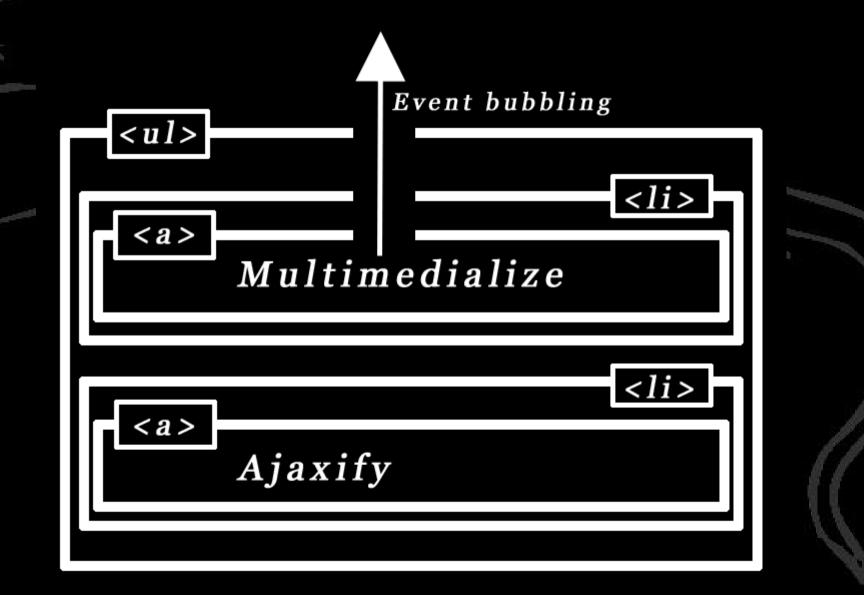
Or are we ... ?

Event capturing to the rescue.

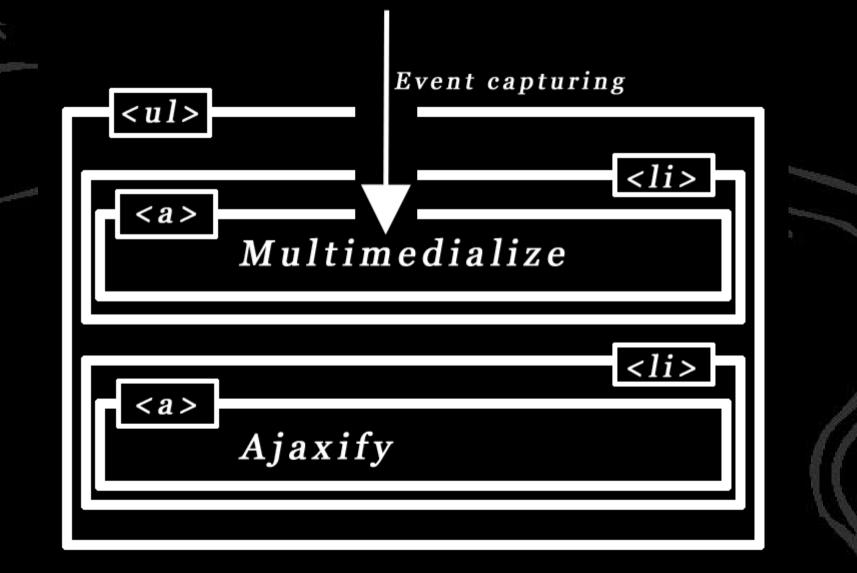
Event capturing is the opposite of event bubbling, and it is supported in all W3Ccompliant browsers.



Event bubbling addEventListener('click',fn,false)

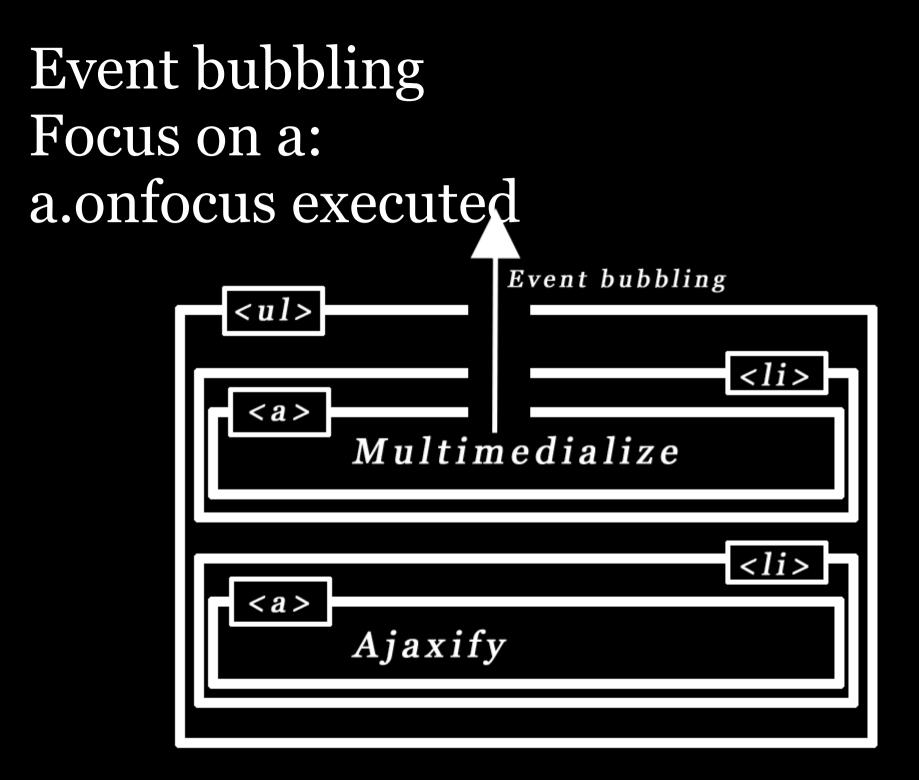


Event capturing addEventListener('click',fn,true)

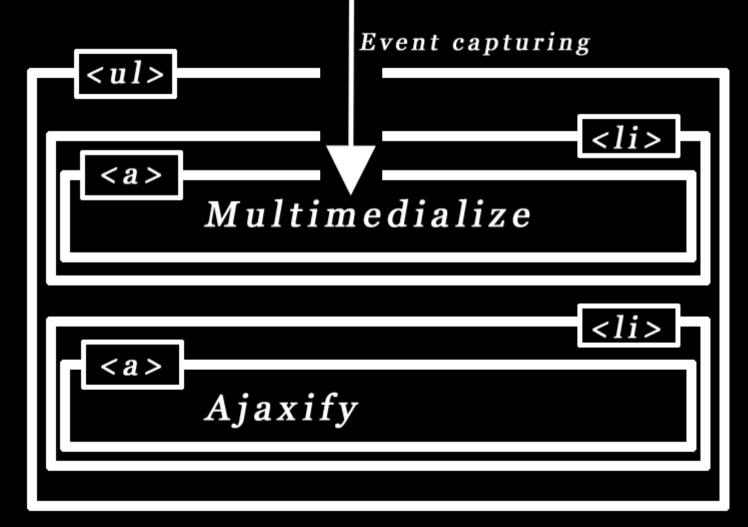


The point is that if you capture a focus event,

event handlers on the target element's ancestors *are* executed.



Event capturing Focus on a: ul.onfocus, li.onfocus and a.onfocus executed



Event capturing and bubbling

Why this difference?

I have no idea.

Maybe it's time to have bubbling and capturing act the same. The current situation doesn't make sense (though it's useful).

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover = this.mouseOver;
 dropdown.onmouseout = this.mouseOut;

var dropdown = {
 init: function (dropdown) {
 dropdown.onmouseover = this.mouseOver;
 dropdown.onmouseout = this.mouseOut;
 dropdown.addEventListener
 ('focus',this.mouseOver,true);
 dropdown.addEventListener
 ('blur',this.mouseOut,true);



var dropdown = { init: function (dropdown) { dropdown.onmouseover = this.mouseOver; dropdown.onmouseout = this.mouseOut; if (dropdown.addEventListener) { dropdown.addEventListener ('focus',this.mouseOver,true); dropdown.addEventListener ('blur',this.mouseOut,true);

And what about IE?

It doesn't support addEventListener, but fortunately it supports the focusin and focusout events which are like focus and blur, except that they bubble.

var dropdown = { init: function (dropdown) { dropdown.onmouseover = this.mouseOver; dropdown.onmouseout = this.mouseOut; if (dropdown.addEventListener) { dropdown.addEventListener ('focus',this.mouseOver,true); dropdown.addEventListener ('blur',this.mouseOut,true);

var dropdown = { init: function (dropdown) { dropdown.onmouseover = this.mouseOver; dropdown.onmouseout = this.mouseOut; if (dropdown.addEventListener) { dropdown.addEventListener ('focus',this.mouseOver,true); dropdown.addEventListener ('blur',this.mouseOut,true); dropdown.onfocusin = this.mouseOver; dropdown.onfocusout = this.mouseOut

dropdown.onmouseover = this.mouseOver; dropdown.onmouseout = this.mouseOut; if (dropdown.addEventListener) { dropdown.addEventListener ('focus',this.mouseOver,true); dropdown.addEventListener ('blur',this.mouseOut,true); dropdown.onfocusin = this.mouseOver; dropdown.onfocusout = this.mouseOut;











Device independence



ŧ.

Mobile phones



The Mobile Web is finally coming, and thanks to Vodafone I'm able to give you some information, although the subject remains a tricky

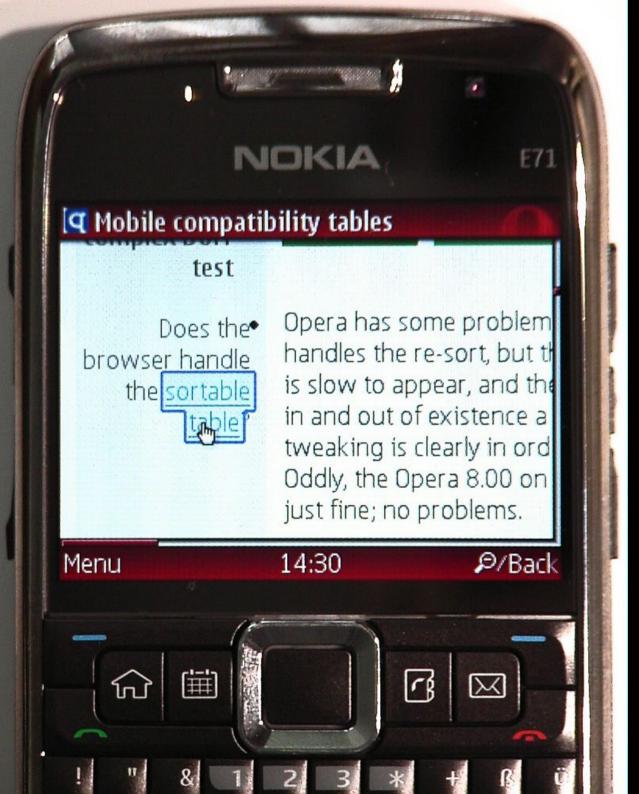
one.



Mobile phones – input modes

- On mobile phones there are three input modes:
- Touch
- Cursor (or rather, pseudo-cursor)
- Four-way navigation ("arrow" keys)

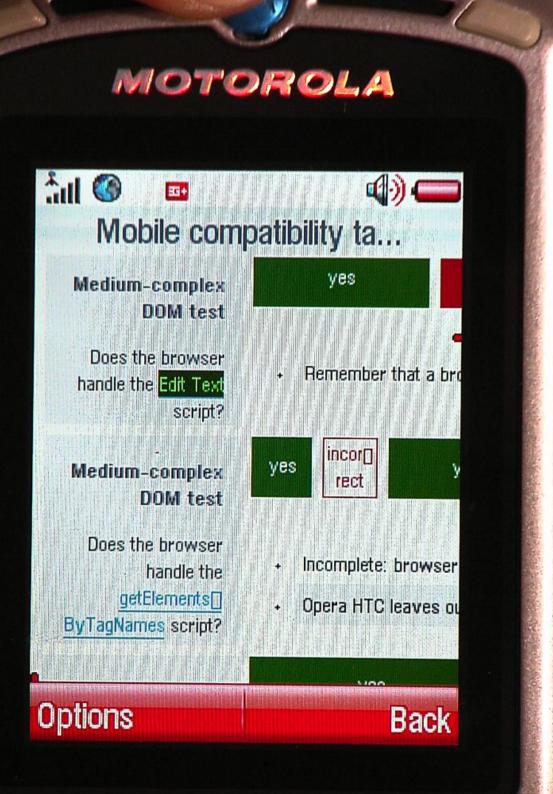






Opera Mini 4.2 on Nokia E71

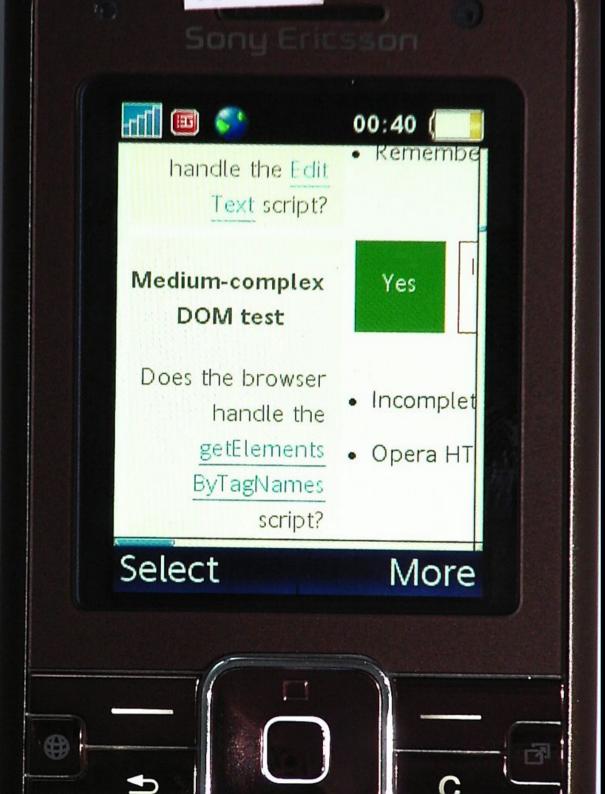
Pseudocursor input mode



vodafone

Opera Mobile 8.00 on Motorola V3xx

Four-way navigation



vodafone

NetFront on Sony Ericsson K770i

Four-way navigation, but which link do you follow when you click?

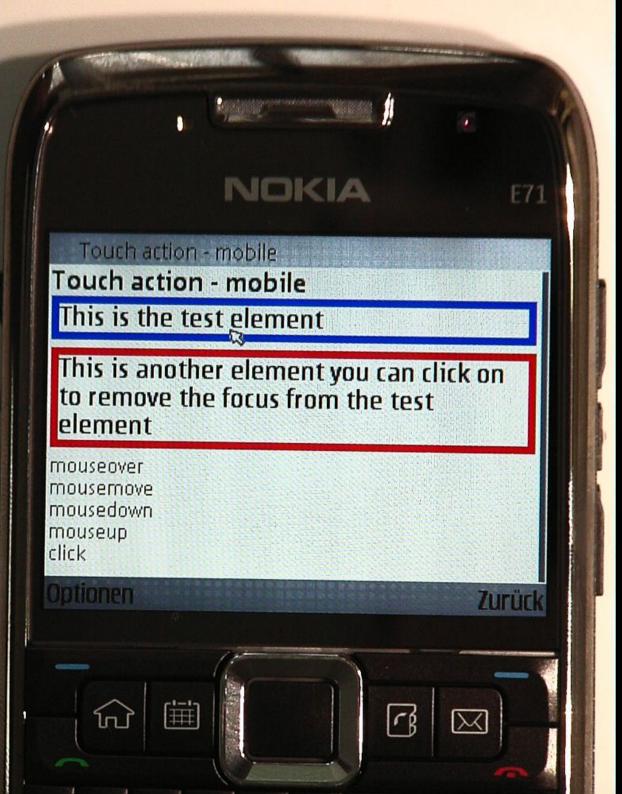
In such an environment, what does "mouseover" mean?

And what about mouseout, mousemove, mousedown, mouseup?

And click?

I set up a test in which I "click" on a <div> element and see which events take place.

First some good news:





S60 WebKit on Nokia E71 Input: cursor

The same as desktop browsers

Touch action - mobile

This is the test element

This is another element you can click on to remove the focus from the test element

mousemove mouseover mousedown mouseup click



Opera Mobile 9.5 on HTC Touch Diamond Input: touch

This is the same as the iPhone does.

So Nokia cursor phones behave exactly as desktop computers,

while the latest Opera behaves exactly as the iPhone.

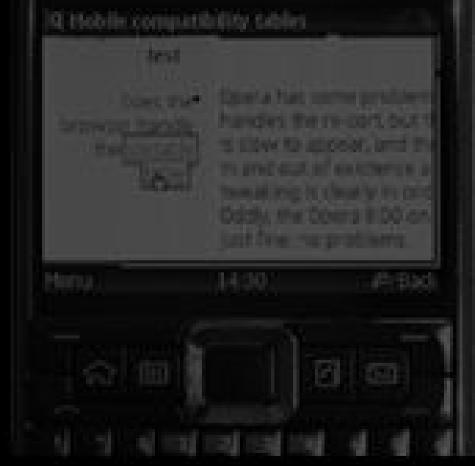


iPhone/Opera model:

As soon as the user touches an element mouseover, mousemove, mousedown, mouseup, and click fire, and the :hover styles are applied.

When user touches another element, mouseout fires and :hover styles are removed

Now for some bad news.





Touc... 1 🖾 1 🔊 🛞 1 🌒 🖧 🗗 3G 🏹 💵

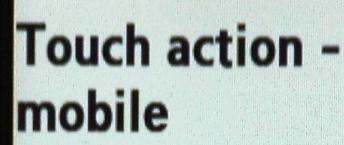
Touch action - m

This is the test element

This is another element you on to remove the focus fro element

mousedown mouseup click Blackberry Storm Input: touch

No mouseover, -out, or -move



This is the test element

This is another element you can click on to remove the focus from the test element

mousedown mouseup



NetFront on Samsung F700 Input: touch

Where's the click?

These are only 4 of the 19 browsers I tested, and there are hundreds of browsers on mobile phones.



General rules for events on mobile phones 1/3: - use click (and let's politely but firmly give

the finger to browsers that do not support it) - forget about the mouse events

In fact, I think the time has come to retire the mouse events on all devices (with a few exceptions)

General rules for events on mobile phones 2/3: - use the resize AND the orientationchange event

orientationchange is supported only by iPhone and Blackberry resize is supported by Opera and all WebKits NetFront doesn't support either – too bad

General rules for events on mobile phones 3/3: - use key events only for setting general access keys; and NOT for reading out user input in a form field

You should read out the field's value instead.

Event compatibility for desktop:

When an element loses the focus.

• Firefox 2 fires too many events in a variety of circumstances.

• Firefox 3 fires too many events when blurring the window.

http://quirksmode.org/dom/events

Mobile compatibility (work in progress)

When a mousedown and mouseup event occur on the same element

http://quirksmode.org/m/

Event	IE 5.5	IE Ó	IE 7	IE8bi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7
textmenu				minimal	yes	buggy	У, 6	es.	:n:);	no

When the user right-clicks to ge the context menu

Preventing the default (i.e. preventing the context menu from appearing) is the whole point of this event.

Event	IE 5.5	IE ó	IE 7	IESbi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7	
blur	yes				too many		incom plete		incom	plete	incomplete	
When an element loses the focus.	• Firefox 2 fires too many events in a variety of circumstances.											
	 Firefox 3 fires too many events when blurring the window. Safari and Opera don't support these events on links and/or form fields in all circumstances. 											
 Konqueror doesn't support these events on the browser window. 												
<u>change</u>		Γ	h	21		es of this e	70		γe	95	Yes	
When a form field value changes.												
f	br	V	70	ur	'a	tt	en	ti	on	15	VBS	
When a mousedown and mouseup event occur on the same element OR an element is activated by the keyboard.												
Event	IE 5.5	IE 6	IE 7	IE8bi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.26	Opera 9.5b	Konqueror 3.5.7	
contextmenu				minimal	yes	buggy	y,	85	ា	0	no	
When the user right-clicks to get the context menu. Preventing the default (i.e. preventing the context menu from appearing) is the whole point of this event.									point of this			

Event	IE 5.5 IE ć	IE 7	IESbi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.2ŏ	Opera 9.5b	Konqueror 3.5.7	
blur	\square	yes_		too T-		incom	~ 2	incom	plete	incomplete	
When an element loses the focus.		2 fires to	Co many e	vents in	a variety (ofcircum	stances.				
	• Firefox	3 fires to	oo many e	vents wl	nen blurrin	ng the wir	idow.				
	• Safari a	nd Opera	a don't suj	oport the	ese events	on links a	nd/or for	m fields i	n all circu	imstances.	
Konqueror doesn't support these events on the browser window.											
Ask aw	av										
change		puggy									
When a form field value changes.		.			C 1 1			1. 11			
\sim 1					g of this ev	ent on ch	eckboxes	and radio	os.		
Or ask m	ne o	n	Γw	itt	er	ÿ	es	y.e		yes	
http://twitter.com/ppk											
					/ P .						
or on my	r cit	Δ									
		LE 7	IESbi	FF 2	FF 3b5	Saf 3.0 Win	Saf 3.1 Win	Opera 9.20	Opera 9.5b	Konqueror 3.5.7	
http://q	nirl	ror	nn	പപ		·σ		10.650.091	1343		
				uc		8	BS	 	0	no:	
When the user right-clicks to get	Durana Maria	1 - J-6-			the conte			الما تعميلهم	howhole	paint of this	

When the user right-clicks to get the context menu.

Preventing the default (i.e. preventing the context menu from appearing) is the whole point of this event.