# Advancing FOCUS


## Glen R. Goodwin

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arei.net

github.com/arei

STUPENDOUS

AMAZING

# TOTALLY RIVETING

# Focus Subsystem

# Focus Subsystem

# Focus Subsystem

# Focus Subsystem

# Focus Subsystem

- Does it work well?

- Does it work well?
- Does it meet the needs of the developers?

- Does it work well?
- Does it meet the needs of the developers?
- Could it do more to be better?

# Focus

First Name

Last Name

Mailing Address

City

State/Province

Postal Code

Country

First Name

Last Name

Mailing Address

City

State/Province

Postal Code

Country

First Name

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Mailing Address

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WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia
Wikipedia store

Interaction
Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools
What links here
Related changes
Upload file
Special pages
Permanent link
Page information
Wikidata item
Cite this page

Print/export

# Focus (computing)

From Wikipedia, the free encyclopedia

In computing, the **focus** indicates the component of the graphical user interface which is selected to receive input. Text entered at the keyboard or pasted from a clipboard is sent to the component which has the focus. Moving the focus away from a specific user interface element is known as a **blur** event in relation to this element. Typically, the focus is withdrawn from an element by giving another element the focus. This means that focus and blur events typically both occur virtually simultaneously, but in relation to different user interface elements, one that gets the focus and one that gets blurred.

The concept is similar to a cursor in a text-based environment. However, when considering a graphical interface, there is also a mouse pointer involved. Moving the mouse will typically move the mouse pointer without changing the focus. The focus can usually be changed by clicking on a component that can receive focus with the mouse. Many desktops also allow the focus to be changed with the keyboard. By convention, the Tab key is used to move the focus to the next focusable component and Shift + Tab to the previous one. When graphical interfaces were first introduced, many computers did not have mice, so this alternative was necessary. This feature makes it easier for people that have a hard time using a mouse to use the user interface. In certain circumstances, the arrow keys can also be used to move focus.

**Contents** [hide]

1 Window focus
1.1 Click to focus
1.2 Focus follows pointer
1.3 Sloppy focus
2 Focus models used by X11 window managers
3 Intra-window component focus
4 See also
5 References
6 Notes

First Name

G

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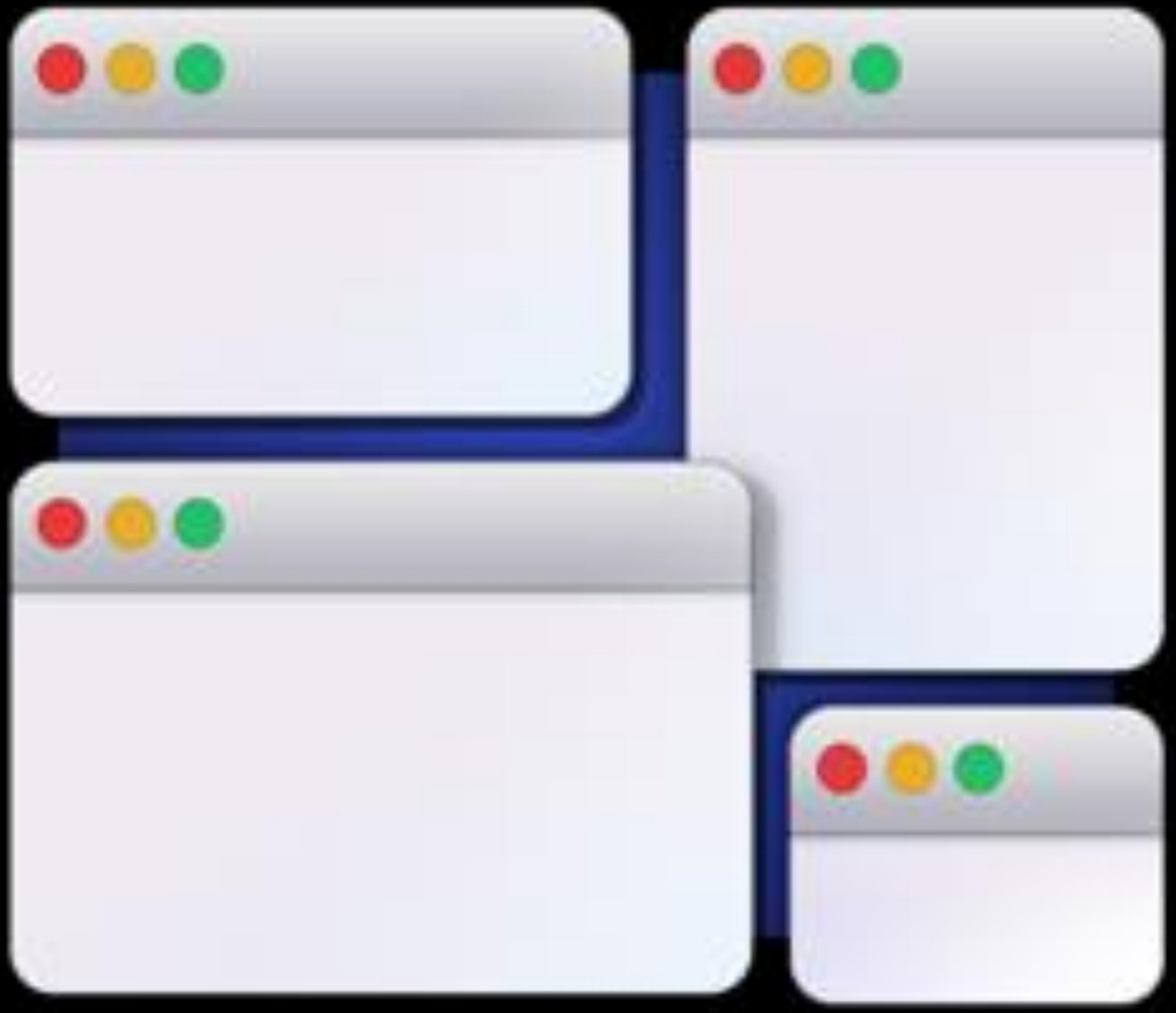
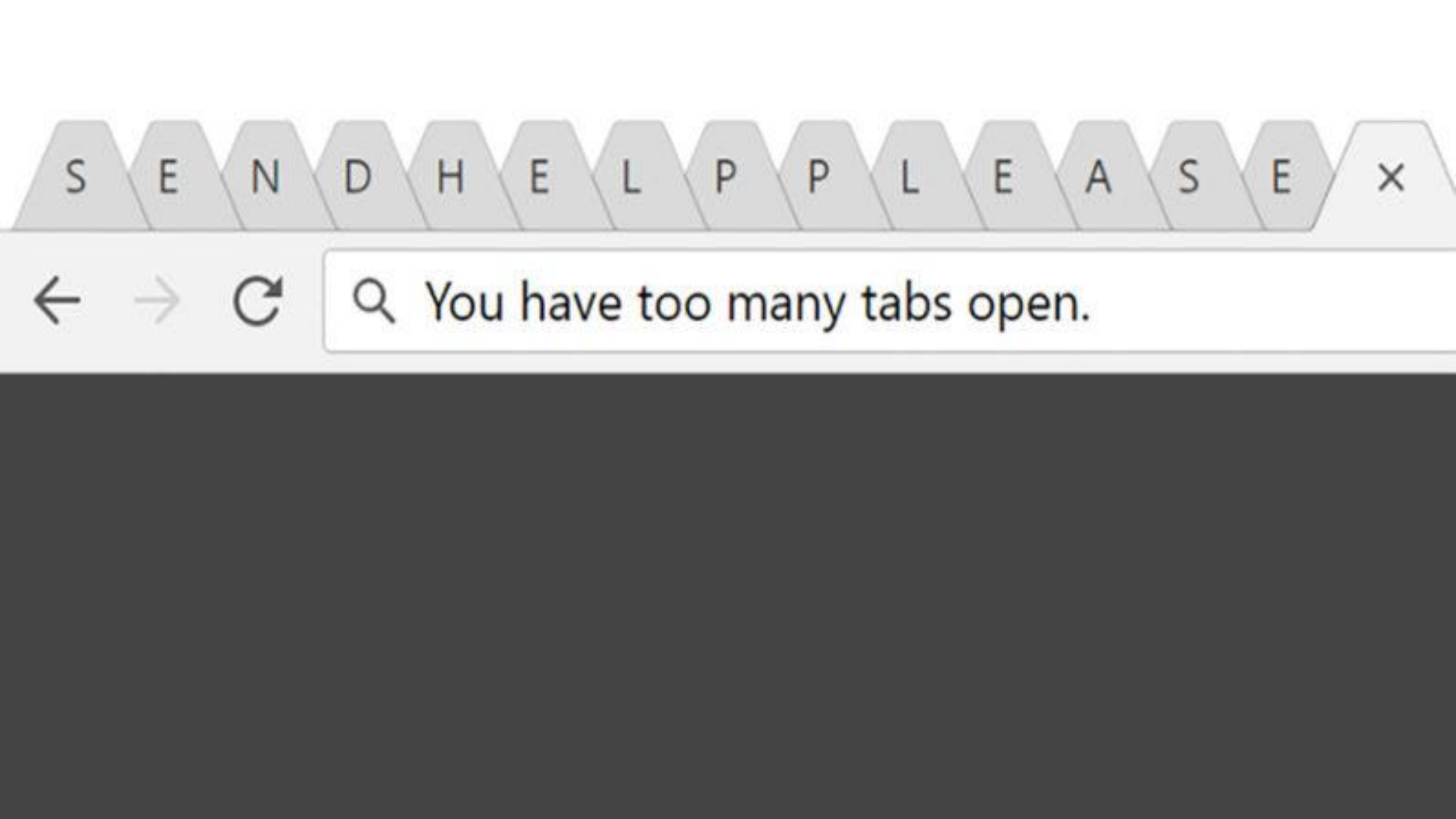
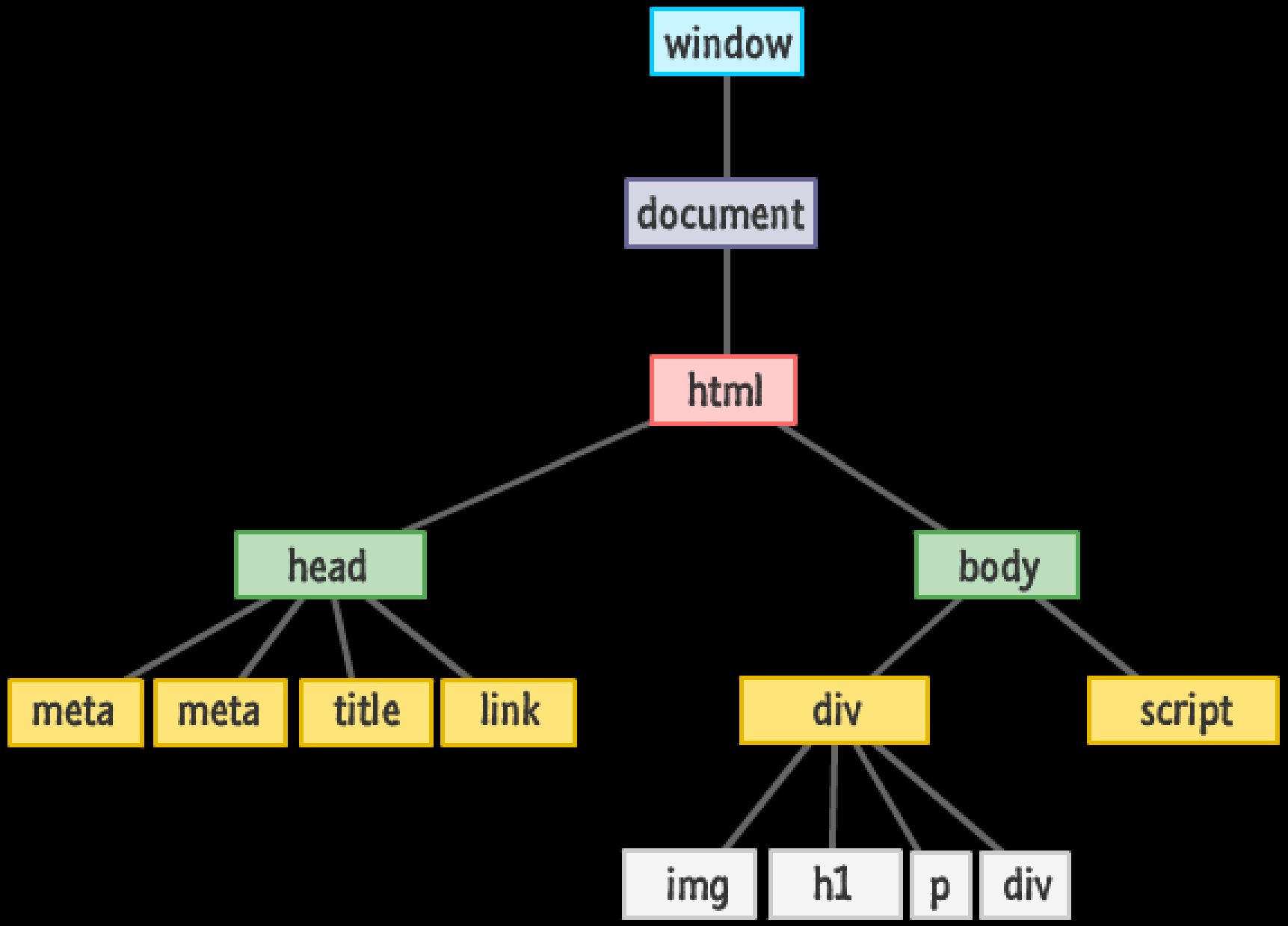
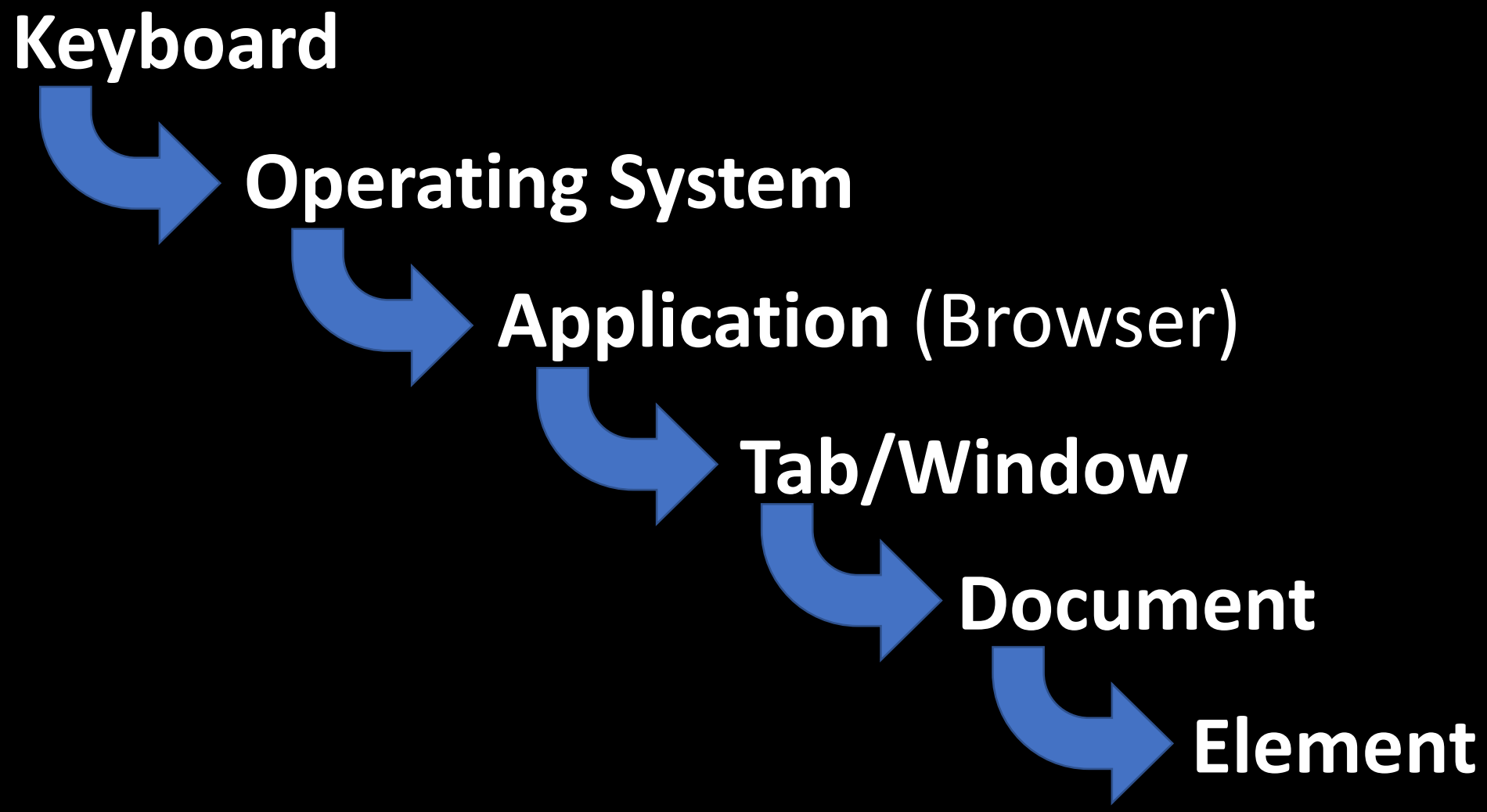
Shift
ANY
Ctrl




S E N D H E L P P L E A S E
You have too many tabs open.


window
document
html
head
body
meta
meta
title
link
div
script
img
h1
p
div

document.**activeElement**


Keyboard
Operating System
Application (Browser)
Tab/Window
Document
Element

Properties

**document.activeElement**

Methods

**element.focus()**

**element.blur()**

Events

**focus**

**blur**

**focusin**

**focusout**

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https://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/



# Document Object Model (DOM) Level 1 Specification

**Version 1.0**

**W3C Recommendation *1 October, 1998***

**This version**

http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001
http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/DOM.ps
http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/DOM.pdf
http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/DOM.tgz
http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/DOM.zip
http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/DOM.txt

**Latest version**

http://www.w3.org/TR/REC-DOM-Level-1

**Previous versions**

http://www.w3.org/TR/1998/PR-DOM-Level-1-19980818
http://www.w3.org/TR/1998/WD-DOM-19980720
http://www.w3.org/TR/1998/WD-DOM-19980416
http://www.w3.org/TR/WD-DOM-19980318
http://www.w3.org/TR/WD-DOM-971209
http://www.w3.org/TR/WD-DOM-971009

**WG Chair**

Lauren Wood, *SoftQuad, Inc.*

**Editors**

Vidur Apparao, *Netscape*
Steve Byrne, *Sun*
Mike Champion, *ArborText*
Scott Isaacs, *Microsoft*

## Interface *HTMLSelectElement*

The select element allows the selection of an option. The contained options can be directly accessed through the select element as a collection. See the SELECT element definition in HTML 4.0.

### IDL Definition

```
interface HTMLSelectElement : HTMLElement {
  readonly attribute  DOMString           type;
           attribute  long                selectedIndex;
           attribute  DOMString           value;
  readonly attribute  long                length;
  readonly attribute  HTMLFormElement     form;
  readonly attribute  HTMLCollection      options;
           attribute  boolean             disabled;
           attribute  boolean             multiple;
           attribute  DOMString           name;
           attribute  long                size;
           attribute  long                tabIndex;
  void                     add(in HTMLElement element,
                               in HTMLElement before);
  void                     remove(in long index);
  void                     blur();
  void                     focus();
};
```

### Attributes

`type`
The type of control created.

`selectedIndex`
The ordinal index of the selected option. The value -1 is returned if no element is selected. If multiple options are selected, the index of the first selected option is returned.

`value`
The current form control value.

`length`
The number of options in this `SELECT`.

# Not really Glen…

But pretend it is and he's as dashing as international heart-throb Brian Posehn…

Username

Username must:

- begin with a letter.
- be lowercase.
- only contain letters A-Z or numbers 0-9.

Enter

```
import {ZephComponents,html,onEventAt} from "ZephJS";
ZephComponents.define("my-user-field",()=>{
   html(`
      <div class="wrapper">
         <input class="field" type="text"></input>
      </div>
   `);

   onEventAt("input","keyup",(element,content,event)=>{
      if (event.keyCode===13) {

         ??????????????

      }
   });
});
```

# ZephJS

zephjs.com

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zephjs.com

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- Root element
- Metadata and scripting
- Embedding content
- Text-level semantics
- Grouping content
- Forms
- Document sections
- Tabular data
- Interactive elements

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# EXCEPT!

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https://allyjs.io/data-tables/focusable.html

| Element | Expected | Chrome | | Microsoft Edge | | | | Firefox | | IE | | | Opera | Safari | | | WebKit Nightly | Chrome Mobile (Android) | Saf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 55.0 | 57.0 | 12.10240 | 13.10586 | 14.14393 | 15.14951 | 50.0 | 53.0 | 9.0 | 10.0 | 11.0 | 42.0 | 8.0 | 9.1 | 10.0 | 604.1 | 55.0 | |
| **Shadow DOM** | | | | | | | | | | | | | | | | | | | |
| <input tabindex="0"> within ::shadow[tabindex="-1"] 18 20 57 | T tabbable | TR tabbable | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | R tabbable | R tabbable | M 73 inert | M 73 inert | M 73 inert | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | TR focusable | M |
| <input tabindex="2"> within ::shadow[tabindex="-1"] 18 20 57 | T tabbable | TR tabbable | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | R tabbable | R tabbable | M 73 inert | M 73 inert | M 73 inert | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | TR focusable | M |
| <input tabindex="1"> within ::shadow within ::shadow[tabindex="-1"] 18 20 57 | T tabbable | TR tabbable | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | R tabbable | R tabbable | M 73 inert | M 73 inert | M 73 inert | TR tabbable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | TR focusable | M |
| ::shadow[tabindex="0"] 18 19 | tabbable | C tabbable | C tabbable | tabbable | tabbable | tabbable | tabbable | tabbable | tabbable | tabbable | tabbable | tabbable | C tabbable | tabbable | tabbable | tabbable | tabbable | C focusable | fo |
| <input tabindex="-1"> within ::shadow[tabindex="0"] 18 20 | T focusable | TR focusable | TR focusable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | R focusable | R focusable | M 73 inert | M 73 inert | M 73 inert | TR focusable | M 73 inert | M 73 inert | M 73 inert | M 73 inert | TR focusable | M |
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| **Iframe Element** | | | | | | | | | | | | | | | | | | | |
| <iframe src="…"> without focusable content 21 | focusable | S tabbable | S tabbable | focusable | focusable | focusable | focusable | DSC tabbable | DSC tabbable | C focusable | C focusable | C focusable | S tabbable | S tabbable | S tabbable | S tabbable | S tabbable | S focusable | S fo |
| <iframe src="…" tabindex="-1"> without focusable content 21 | focusable | S focusable | S focusable | focusable | focusable | focusable | focusable | DSC focusable | DSC focusable | C focusable | C focusable | C focusable | S focusable | S focusable | S focusable | S focusable | S focusable | S focusable | S fo |
| <iframe src="…"> with SVG document 21 | focusable | DSC focusable | DSC focusable | C focusable | C focusable | C focusable | C focusable | DSC tabbable | DSC focusable | C focusable | C focusable | C focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC fo |
| <iframe src="…"> with focusable content 21 | focusable | DSC focusable | DSC focusable | C focusable | C focusable | C focusable | C focusable | DSC focusable | DSC focusable | C focusable | C focusable | C focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC focusable | DSC fo |
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| <iframe src="…" style="visibility: hidden"> | inert | C inert host | C inert host | inert | inert | inert | inert | inert | inert | inert | inert | inert | C inert host | C inert host | C inert host | C inert host | C inert host | C inert host | C in |
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# § 6.4 Focus

## § 6.4.1 Introduction

*This section is non-normative.*

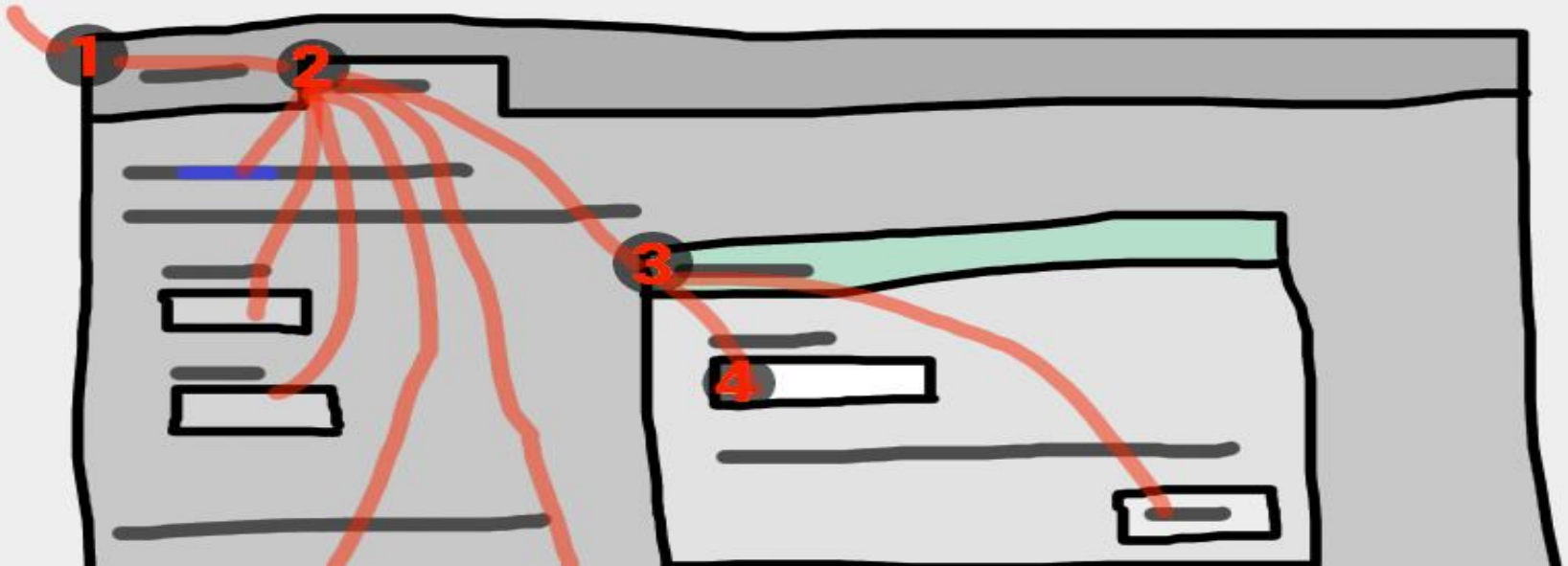
An HTML user interface typically consists of multiple interactive widgets, such as form controls, scrollable regions, links, dialog boxes, browser tabs, and so forth. These widgets form a hierarchy, with some (e.g. browser tabs, dialog boxes) containing others (e.g. links, form controls).

When interacting with an interface using a keyboard, key input is channeled from the system, through the hierarchy of interactive widgets, to an active widget, which is said to be focused.

**Example**

Consider an HTML application running in a browser tab running in a graphical environment. Suppose this application had a page with some text controls and links, and was currently showing a modal dialog, which itself had a text control and a button.

The hierarchy of focusable widgets, in this scenario, would include the browser window, which would have, amongst its children, the browser tab containing the HTML application. The tab itself would have as its children the various links and text controls, as well as the dialog. The dialog itself would have as its children the text control and the button.



- Elements that have their tabindex focus flag set, that are not actually disabled, that are not expressly inert, and that are either being rendered or being used as relevant canvas fallback content.
- The shapes of area elements in an image map associated with an img element that is being rendered and is not expressly inert.
- The user-agent provided subwidgets of elements that are being rendered and are not actually disabled or expressly inert
- The scrollable regions of elements that are being rendered and are not expressly inert.
- The viewport of a Document that is in a browsing context and is not inert.
- Any other element or part of an element, especially to aid with accessibility or to better match platform conventions.

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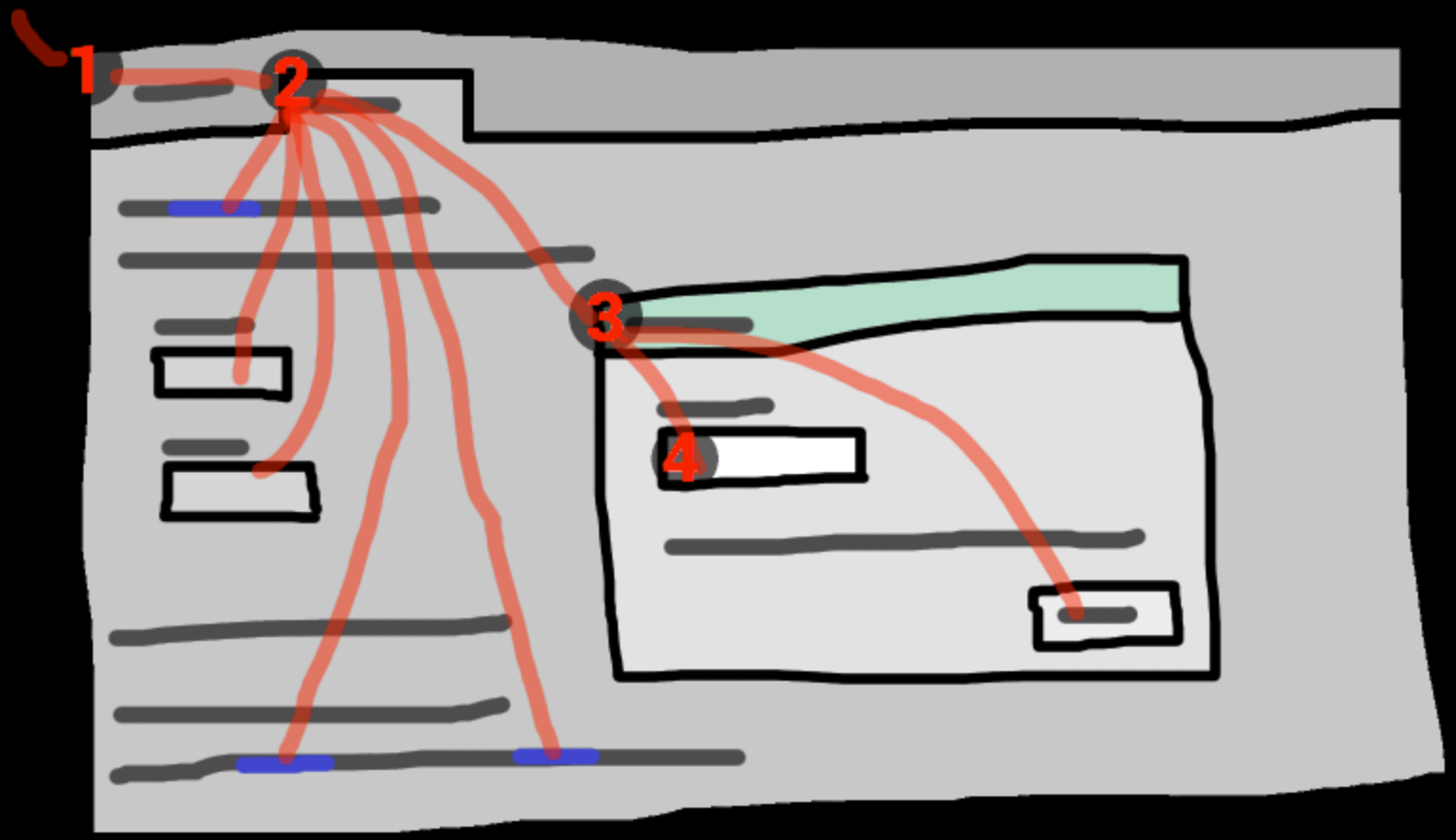
# 1 No way to automatically advance (or reverse) focus

1 No way to automatically advance (or reverse) focus

2 No way to determine what is focusable

1 No way to automatically advance (or reverse) focus

2 No way to determine what is focusable


1
2
3
4

✓ .isFocusable(e)

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()
- ✓ .trap()

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()
- ✓ .trap()
- ✓ .order()

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- ✓ .order()

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()
- ✓ .trap()
- ✓ .order()
- ✓ .previousActiveElement
- ✓ .history

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()
- ✓ .trap()
- ✓ .order()
- ✓ .previousActiveElement
- ✓ .history
- ✓ .autofocus(e)

- ✓ .isFocusable(e)
- ✓ .forward()
- ✓ .backward()
- ✓ .trap()
- ✓ .order()
- ✓ .previousActiveElement
- ✓ .history
- ✓ .autofocus(e)
- ✓ ???

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- ✓ .backward()
- ✓ .trap()
- ✓ .order()
- ✓ .previousActiveElement
- ✓ .history
- ✓ .autofocus(e)
- ✓ ???

**Glen’s Awesome JS Focus Library**

README.md

# tabbable

build passing

**SEEKING CO-MAINTAINERS!** Continued development of this project is going to require the work of one or more dedicated co-maintainers (or forkers). If you're interested, please comment in this issue.

Returns an array of all* tabbable DOM nodes within a containing node. (* "all" has some necessary caveats, which you'll learn about by reading below.)

The following are considered tabbable:

- `<button>`s
- `<input>`s
- `<select>`s
- `<textarea>`s
- `<a>`s with `href` or `xlink:href` attributes
- `<audio>`s and `<videos>`s with `controls` attributes

# window.focusManager

W3C

W3C

WHATWG

W3C
WHATWG

W3C
WHATWG

W3C
WHATWG

# Still not Glen…

But let's pretend Glen is this cool and popular and super well-known…

https://www.google.com/search?q=how+to+propose+changes+to+the+HTML+standard&oq=how+to+propose+chan...

Google

how to propose changes to the HTML standard

All | News | Videos | Images | Shopping | More | Settings | Tools

About 191,000,000 results (0.94 seconds)

7 W3C Recommendation Track Process
https://www.w3.org/2004/02/Process-20040205/tr.html
Feb 5, 2004 - 7.7.1 **Proposal** to Rescind a Recommendation; 7.7.2 Publication of a ... Note: W3C Recommendations are similar to the **standards** ... A Working Group MUST document **changes** (both substantive and minor) between steps.
Recommendation Track ... · Advancing a Technical ... · Modifying a W3C ...
You visited this page on 7/16/19.

People also ask

What is html6?

What is the latest HTML standard?

What is HTML structure?

What is w3c Candidate Recommendation?

Feedback

HTML 5 - Wikipedia
https://en.wikipedia.org/wiki/HTML5
**HTML** 5 is a software solution stack that defines the properties and behaviors of web page content by implementing a markup based pattern to it. HTML 5 is the fifth and current major version of HTML and

# Web Platform Incubator Community Group

# Web Platform Incubator Community Group

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WHATWG

Hey

Hey

Hey

Y Hacker News

JS DAILY

JS
CONF

# The Focus Traversal API Proposal

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focusManager.isFocusable(e)
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focusManager.backward()
focusManager.next(e)
focusManager.previous(e)
focusManager.hasFocus(e)
focusManager.focus(e)
focusManager.orderedElements()
focusManager.currentlyFocused
focusManager.previouslyFocused
focusManager.history

| Coming Soon… |
| --- |
| focusManager.trap(e) |
| focusManager.order(a) |
| focusManager.autofocus(e) |

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github.com/awesomeeng/FocusTraversalAPI

npm install focus-traversal-api-polyfill

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Perhaps I could be
of some assistance?

# Let’s make Browser Focus work for us… Spread the word about the Focus Traversal API Proposal!

https://github.com/awesomeeng/FocusTraversalAPI

#FocusTraversalAPI #JavaScript #Web

# @AREINET

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#FocusTraversalAPI #JavaScript #Web

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Focus Traversal API Explainer
**https://github.com/awesomeeng/FocusTraversalAPI/blob/master/EXPLAINER.md**

Github Repo
**https://github.com/awesomeeng/FocusTraversalAPI**

Github Get Involved Page
**https://github.com/awesomeeng/FocusTraversalAPI/blob/master/GET_INVOLVED.md**

WICG W3C Discourse Discussion
**https://discourse.wicg.io/t/proposal-focus-traversal-api/3427**

WHATWG Github Issue
**https://github.com/whatwg/html/issues/4784**

ZephJS Library
https://zephjs.com