Using DevTools Accessibility tab when manual testing HTML and ARIA.

Annual Interagency Accessibility Forum
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Before diving into the **DevTools Accessibility tab**, let’s review three basic concepts about **HTML elements**:

Accessible names

Roles

Accessible descriptions

Accessible names

Accessible names are short text strings that **provide an assistive technology user with a label for the element**.

Accessible names convey the **purpose of the element**.

Accessible names **distinguish elements from one another**.

Each **accessible name** should be unique.

Roles

Most **HTML** elements have a ‘role’.

Roles define the element’s function – especially for assistive technologies.

The <input type="radio"> element has role of radio.

The <a> element has a role of link.

The <div> element has no inherent role.

Accessible descriptions

Sometimes, an HTML element’s short accessible name may need **additional context**.

For example, **instructions or error messages** associated with form controls.

If applied correctly, additional information is provided as an **accessible description**.

How names, roles and descriptions are announced

Address

Enter full address

<! ---- Accessible name --->

```html
<label for="userAddress">Address</label>
<span id="inst">Enter full address</span>
<input id="userAddress" type="text"
aria-describedby="inst" required />
```

<! ---- Role --->

```
<label for="userAddress">Address</label>
<span id="inst">Enter full address</span>
<input id="userAddress" type="text"
aria-describedby="inst" required />
```

<! ---- Accessible description --->

```
<label for="userAddress">Address</label>
<span id="inst">Enter full address</span>
<input id="userAddress" type="text"
aria-describedby="inst" required />
```

<! ---- State --->

```
<label for="userAddress">Address</label>
<span id="inst">Enter full address</span>
<input id="userAddress" type="text"
aria-describedby="inst" required />
```

Windows / NVDA and JAWS 🔊

1. Accessible name: **Address**
2. Role: **textbox**
3. State: **required**
4. Description: **Enter full address**

OSX / VoiceOver 🔊

1. Accessible name: **Address**
2. State: **required**
3. Role: **textbox**
4. Description: **Enter full address**

How do screen readers access information?

Via **the accessibility tree**.

What is the accessibility tree?

Document Object Model

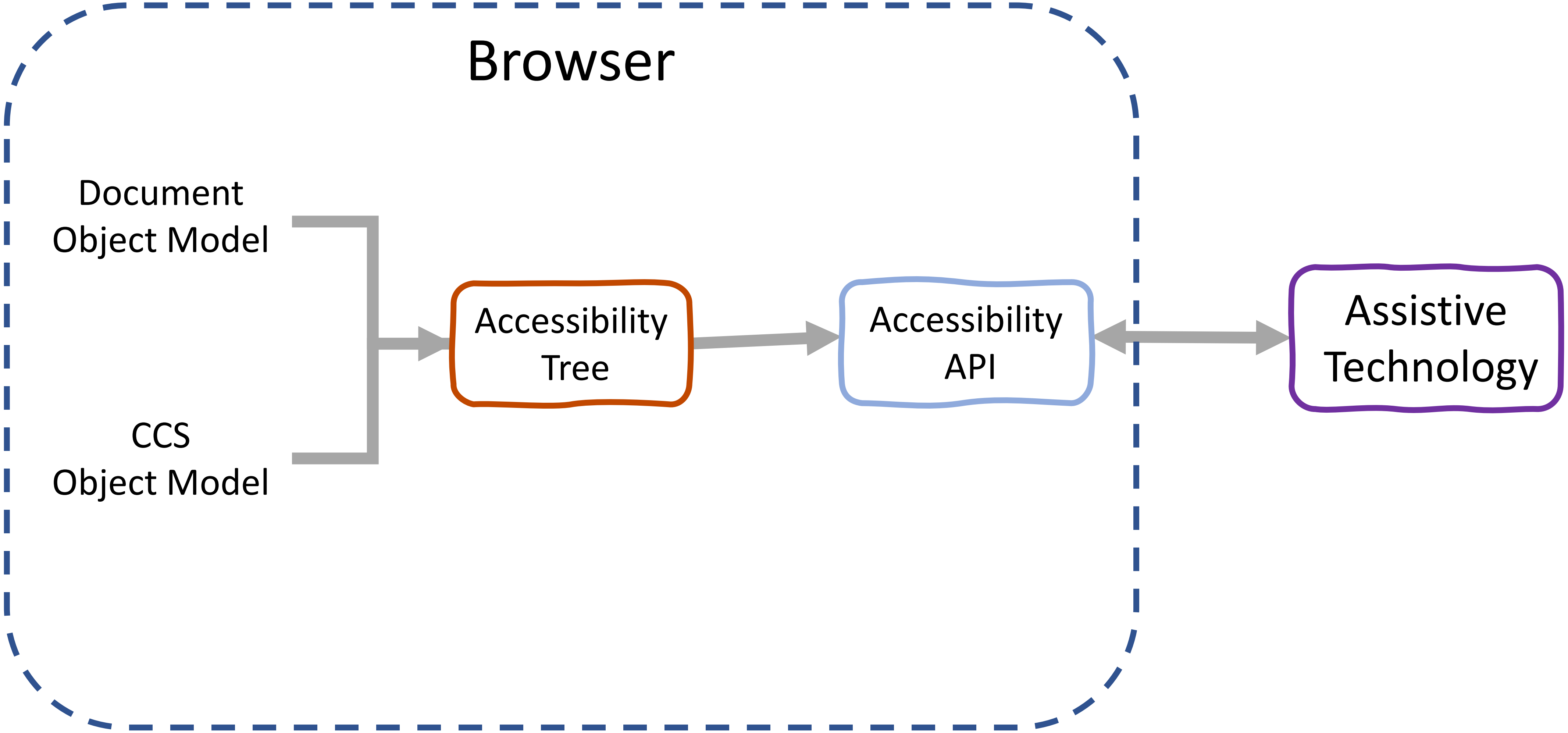
The accessibility tree is a simplified version of the Document Object Model.

The accessibility tree contains accessibility-related information for most HTML elements.

Accessibility tree Information

- Name
- Role
- Description
- State
- Value

This information is given to assistive technologies so that users can **understand, navigate and interact with web documents**.



Browser

Document Object Model

CCS Object Model

Accessibility Tree

Accessibility API

Assistive Technology

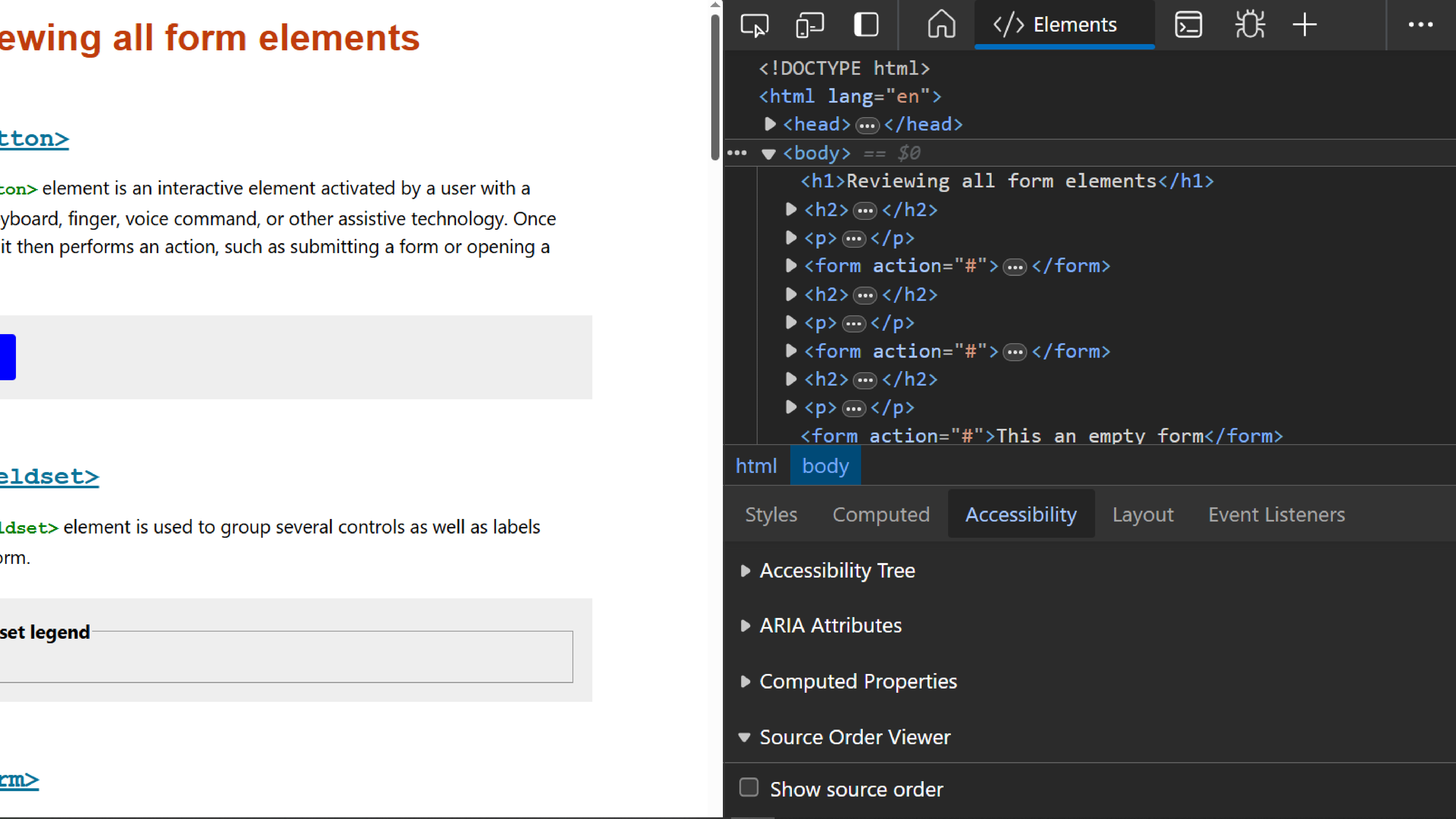
Each **browser** creates **its own version of the accessibility tree** and their own Accessibility APIs.

Why use DevTools Accessibility tab?

DevTools has a feature called the ‘**Computed properties**’ panel.

The **Computed properties** panel gives us a range of accessibility information in one location.

How to access DevTools Accessibility tab.



ewing all form elements

tton>

con> element is an interactive element activated by a user with a yboard, finger, voice command, or other assistive technology. Once it then performs an action, such as submitting a form or opening a

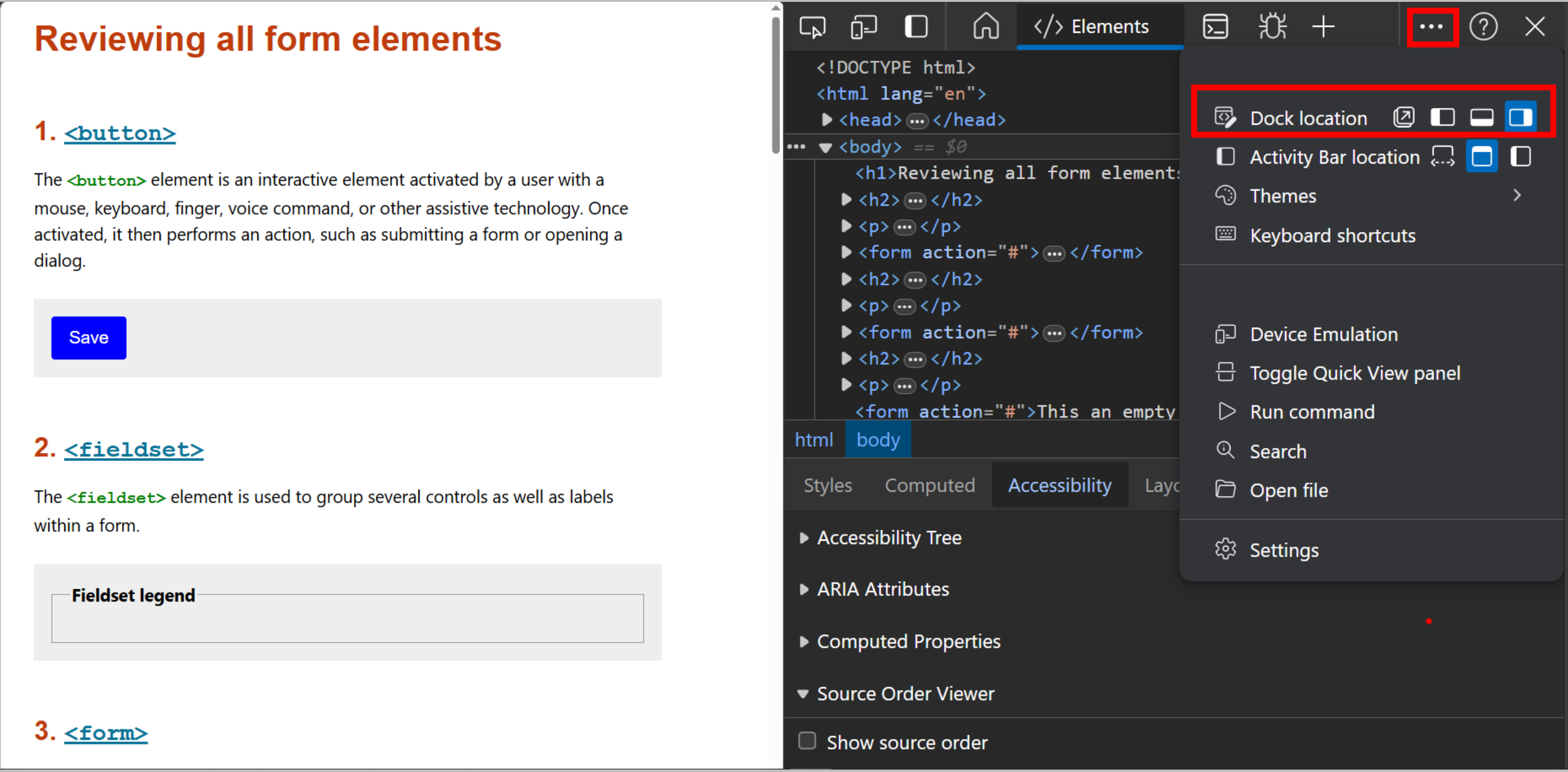
eldset>

ldset> element is used to group several controls as well as labels orm.

set legend

rm>

```
<!DOCTYPE html>
<html lang="en">
 ▶<head>…</head>
••• ▼<body> == $0
     <h1>Reviewing all form elements</h1>
    ▶<h2>…</h2>
    ▶<p>…</p>
    ▶<form action="#">…</form>
    ▶<h2>…</h2>
    ▶<p>…</p>
    ▶<form action="#">…</form>
    ▶<h2>…</h2>
    ▶<p>…</p>
     <form action="#">This an empty form</form>
```



Reviewing all form elements

1. <button>

The <button> element is an interactive element activated by a user with a mouse, keyboard, finger, voice command, or other assistive technology. Once activated, it then performs an action, such as submitting a form or opening a dialog.

Save

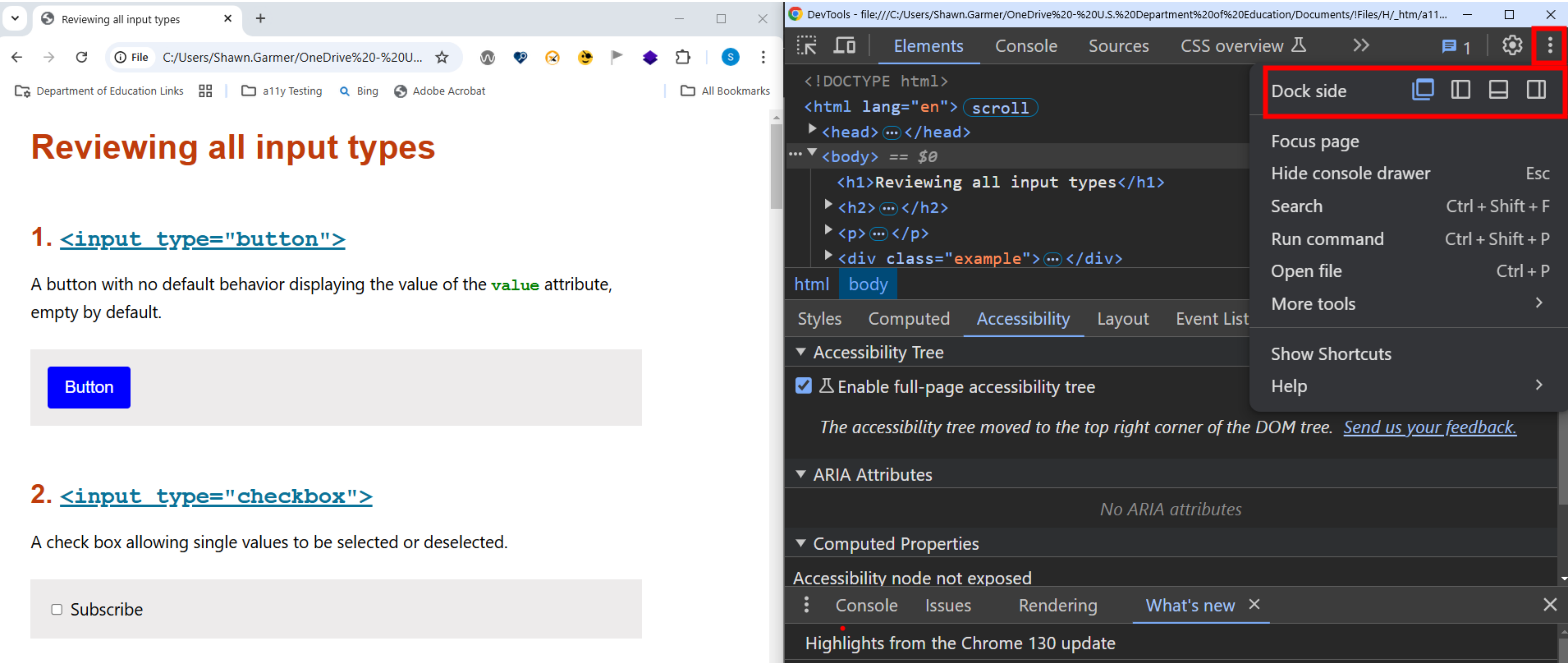
2. <fieldset>

The <fieldset> element is used to group several controls as well as labels within a form.

Fieldset legend

3. <form>

```
<!DOCTYPE html>
<html lang="en">
 ▶<head>…</head>
··· ▼<body> == $0
     <h1>Reviewing all form element
    ▶<h2>…</h2>
    ▶<p>…</p>
    ▶<form action="#">…</form>
    ▶<h2>…</h2>
    ▶<p>…</p>
    ▶<form action="#">…</form>
    ▶<h2>…</h2>
    ▶<p>…</p>
     <form action="#">This an empty
```



Reviewing all input types

1. <input type="button">

A button with no default behavior displaying the value of the `value` attribute, empty by default.

2. <input type="checkbox">

A check box allowing single values to be selected or deselected.

□ Subscribe

```
<!DOCTYPE html>
<html lang="en"> scroll
  ▶<head>…</head>
… ▼<body> == $0
    <h1>Reviewing all input types</h1>
    ▶<h2>…</h2>
    ▶<p>…</p>
    ▶<div class="example">…</div>
```

☑ Enable full-page accessibility tree

The accessibility tree moved to the top right corner of the DOM tree. Send us your feedback.

No ARIA attributes

Accessibility node not exposed

Highlights from the Chrome 130 update

Activity 1:

- Go to the Section508.gov page.

  https://www.section508.gov/

Step 1: Open Developer Tools

1. Right-click anywhere on the page.
2. Select ‘Inspect’.
3. This will open DevTools.

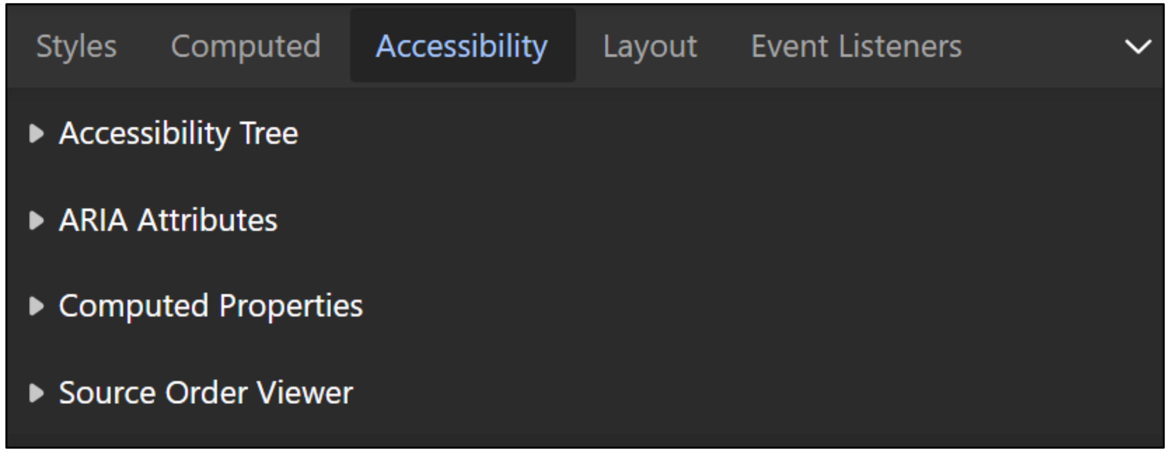
Alternatively, you can use:

- Windows: Control + Shift + C.
- Mac: Command + Opt + I

Step 2: Select the ‘Accessibility’ tab

The Accessibility tab displays:

- ‘Accessibility tree’ panel
- ‘ARIA Attributes’ panel
- ‘Computed Properties’ panel
- ‘Source Order Viewer’ panel



The Accessibility tab demo

1. Inspect the ‘View Accessibility Bytes’ link.

In the Computed properties panel, find the element’s name and role.

Answer:
Name: View Accessibility Bytes
Role: link

2. Inspect the ‘Search’ <input>

In the Computed Properties panel, find the element’s name and role:

Answer

Name: *“Search”*
Role: *“searchbox”*

3. Add text into the ‘Search’ <input>

Does the element now have a value in the Computed Properties panel?

Answer

Value: *‘training’*

This tells assistive technologies what the user has added to the form field before submitting the form, allowing the user to review the information

4. Inspect the ‘Our Mission’ heading

In the Computed Properties panel, find the element’s role and level:

Answer

Role: *heading*
Level: *2*

5. Inspect the image in Our Mission section

In the Computed Properties panel, find the element’s name and role:

Answer

Name: “A portion of a computer keyboard with shining Accessibility text and symbol in place of the enter key”

Role: *image*

6. Inspect the icon for ‘Find your 508 PM’

Does this element provide any information in the Computed Properties panel?

Answer

Accessibility node not exposed

Some elements are **not exposed in the accessibility tree.**

7. Inspect the Key dates table

Click the Policy & Management link. Click the Annual Section 508 Assessment link, then click the Instructions link. Inspect the Key Dates table.
https://www.section508.gov/manage/section-508-assessment/

In the Computed Properties panel, find the <table> element’s name and role:

Answer
Name: *“Table listing of five key dates related to the reporting required under Section 752 of the Consolidated Appropriations Act of 2023"*
Role: *table*

Essential elements within the table also have roles:

Answer

<tr> role = *row*
<th> role = *columnheader or rowheader*
<td> role = *gridcell*

Other properties…

Properties found in the DevTools Computed Properties(depending on the element) are:

- Name: [accessible name as a text string]
- Role: [pre-defined list of valid roles]
- Description: [description as a text string]
- Value: [current value as a text string]
- Required: true | false
- Expanded: true | false
  Checked: true | false
- Disabled: true | false
- Described by: [element #id]
- Labeled by: [element #id]

ARIA alters the accessibility tree

Accessible Rich Internet Applications

ARIA is a set of custom HTML attributes that **add information to the accessibility tree**.

Information is intended to help assistive technology users understand the **name, role or state** of elements.

First rule of ARIA is **Don’t use ARIA when semantic HTML elements can be used**.

Activity 2:

Go to the Section508.gov Home page.

We can see how ARIA attributes can affect the accessibility tree.

1. **Testing** role=“search"

Inspect the Search Input.

Check the parent <div> element’s role in the Computed Properties panel:

Answer
Role: *Search*

We can use ARIA to add semantics to an element that has none.

2. **Testing** aria-label

On the Section508.gov home page, Click the Policy and Management link and inspect the Management link in the secondary navigation.

Check the <a> link element’s name in the Computed Properties:

Answer
Name: *‘Management – Submenu’*

ARIA overrides contents of the element ‘Management’.

3. Testing aria-expanded

Expand the Management sub list.

Check the <a> Link element's 'Expanded' state in the Computed **Properties**:

Answer

Expanded: *true*

We can use ARIA to inform assistive technology users **when an element is expanded or collapsed**.

DevTools is helpful when **reviewing the accessibility of elements**.

Accessibility tree

accessible name generated for each element.

Computed properties

- All possible names (from strongest to weakest).
- Where the names come from (When relevant).
- Which one wins.

Competing names

This <input> element has **five possible accessible names** applied.

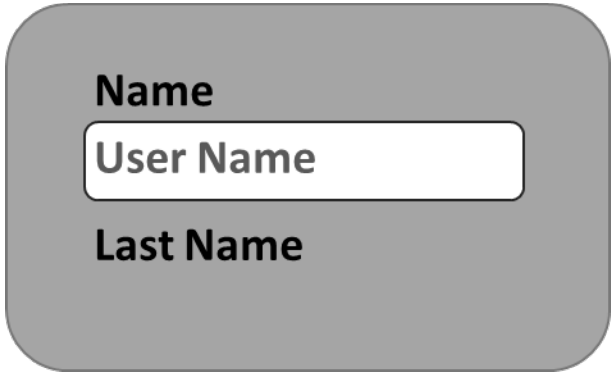
An aria-labelledby value of ‘Last Name’.

An aria-label value of ‘Applicant’.

A <label> value of ‘Name’.

A title value of ‘First Name’.

A placeholder value of ‘User Name’.

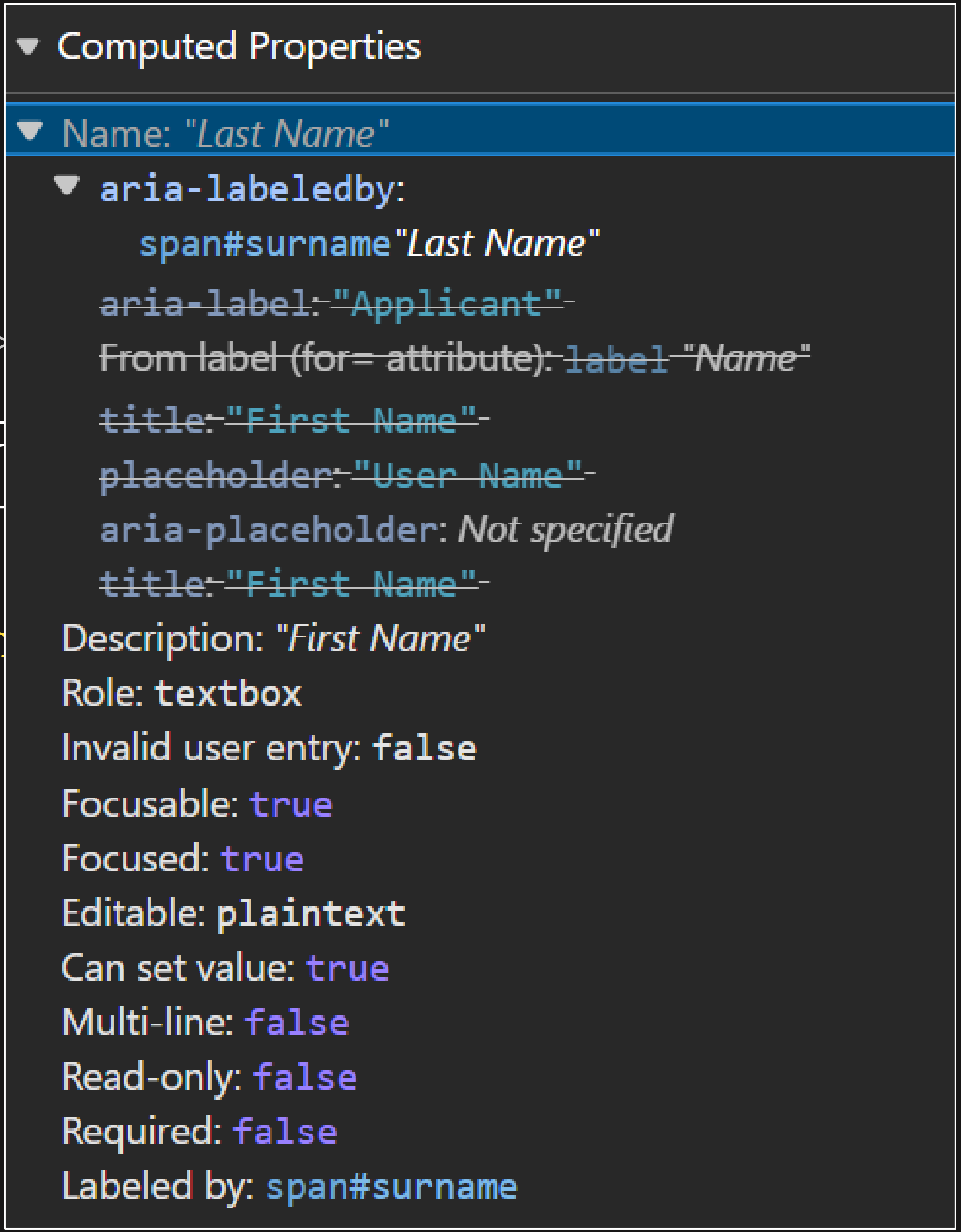


```
<label for="userName">Name</label>

<input id="userName" type="text" title="First Name"
placeholder="User Name" aria-label="Applicant“
aria-labeledby="surname"/>

<span id="surname">Last Name</span>
```

```
<label for="userName">Name</label>
<input id="userName" type="text" t
placeholder="User Name" aria-label
aria-labeledby="surname"/>
<span id="surname">Last Name</span
```



Computed Properties

Name: "*Last Name*"

aria-labeledby:

span#surname "*Last Name*"

~~aria-label: "Applicant"~~

~~From label (for= attribute): label "*Name*"~~

~~title: "First Name"~~

~~placeholder: "User Name"~~

aria-placeholder: *Not specified*

~~title: "First Name"~~

Description: "*First Name*"

Role: textbox

Invalid user entry: false

Focusable: true

Focused: true

Editable: plaintext

Can set value: true

Multi-line: false

Read-only: false

Required: false

Labeled by: span#surname

The tricky title attribute

You may find the title attribute used to provide an accessible name for some elements.

However, it is weak and is often **overridden by other methods**.

But the title is **sneaky**! If it loses the accessible name.

IF aria-describedby is present, the title will not be used as the accessible description.

Too good to be true?

DevTools Accessibility tab is amazing. Right?

While DevTools Accessibility tab is very useful, it does not replace any harmonized testing process your organization uses.

Time for any questions?

Thank You!

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