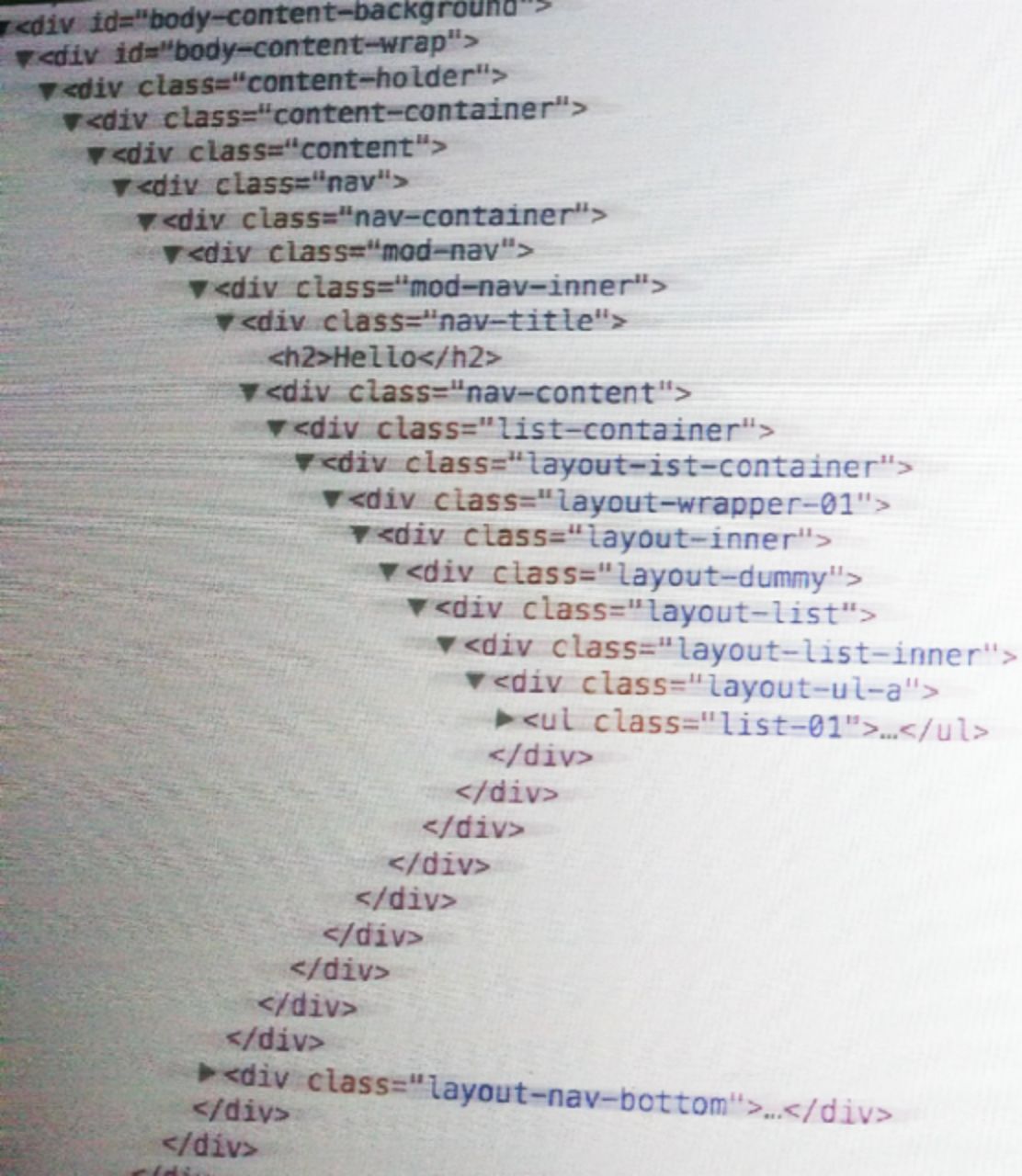
Dominating Shadow DOM

Tomomi Imura (@girlie_mac)

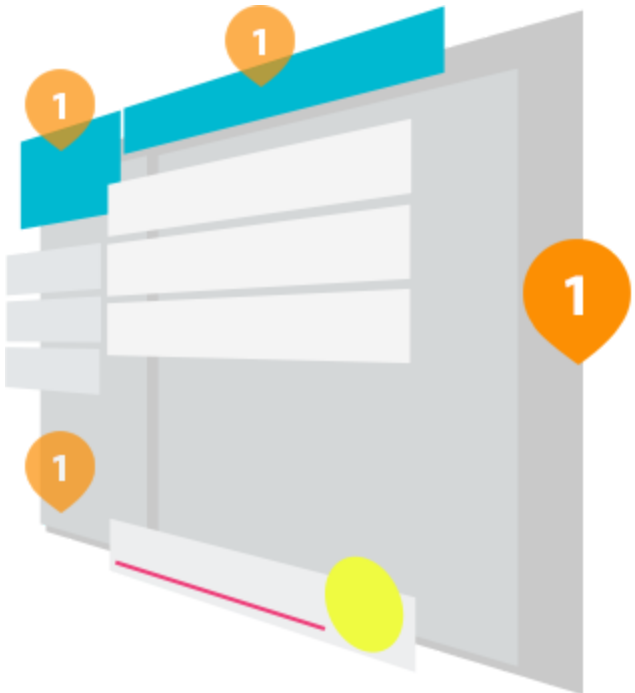
CC0

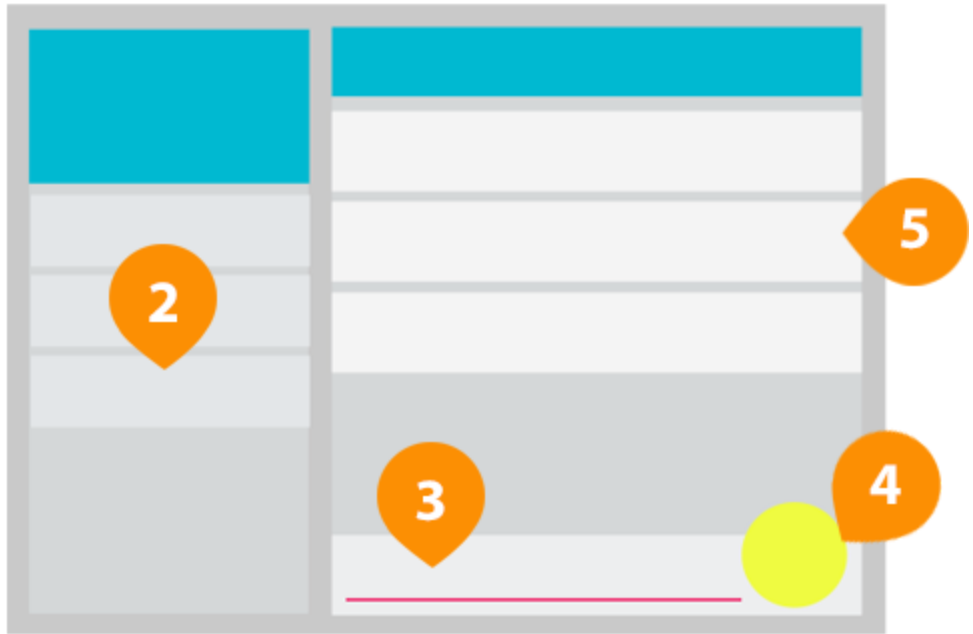
Creating Web UI



Bleh!

Modular UI





```
<core-scaffold>
  <core-header-panel>
    <core-toolbar>Chat Room</core-toolbar>
  </core-header-panel>

  <template repeat="{{m in messages}}">
    <x-chat-list uuid="{{m.uuid}}" text="{{m.text}}"></x-cha
  </template>

  <paper-input on-keyup="{{checkKey}}"></paper-input>
  <paper-fab icon="send"></paper-fab>
</core-scaffold>
```

W3C Web Components

- HTML Imports
- HTML Templates
- Custom Elements
- Shadow DOM

Shadow DOM

Shadow DOM enable markup to:

- be composed in modular pattern
- be encapsulated (Private)
- overlay subtree of nodes

Shadow DOM Browser Supports

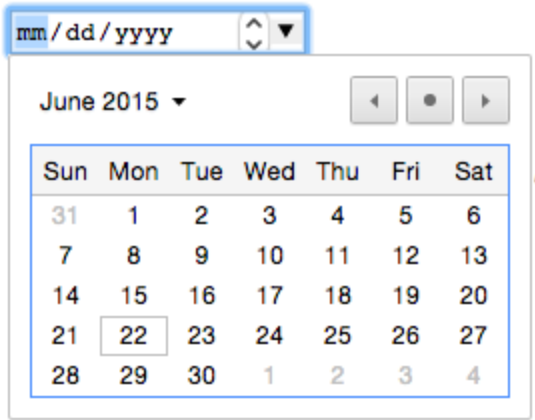
with vendor prefix

no vendor prefix

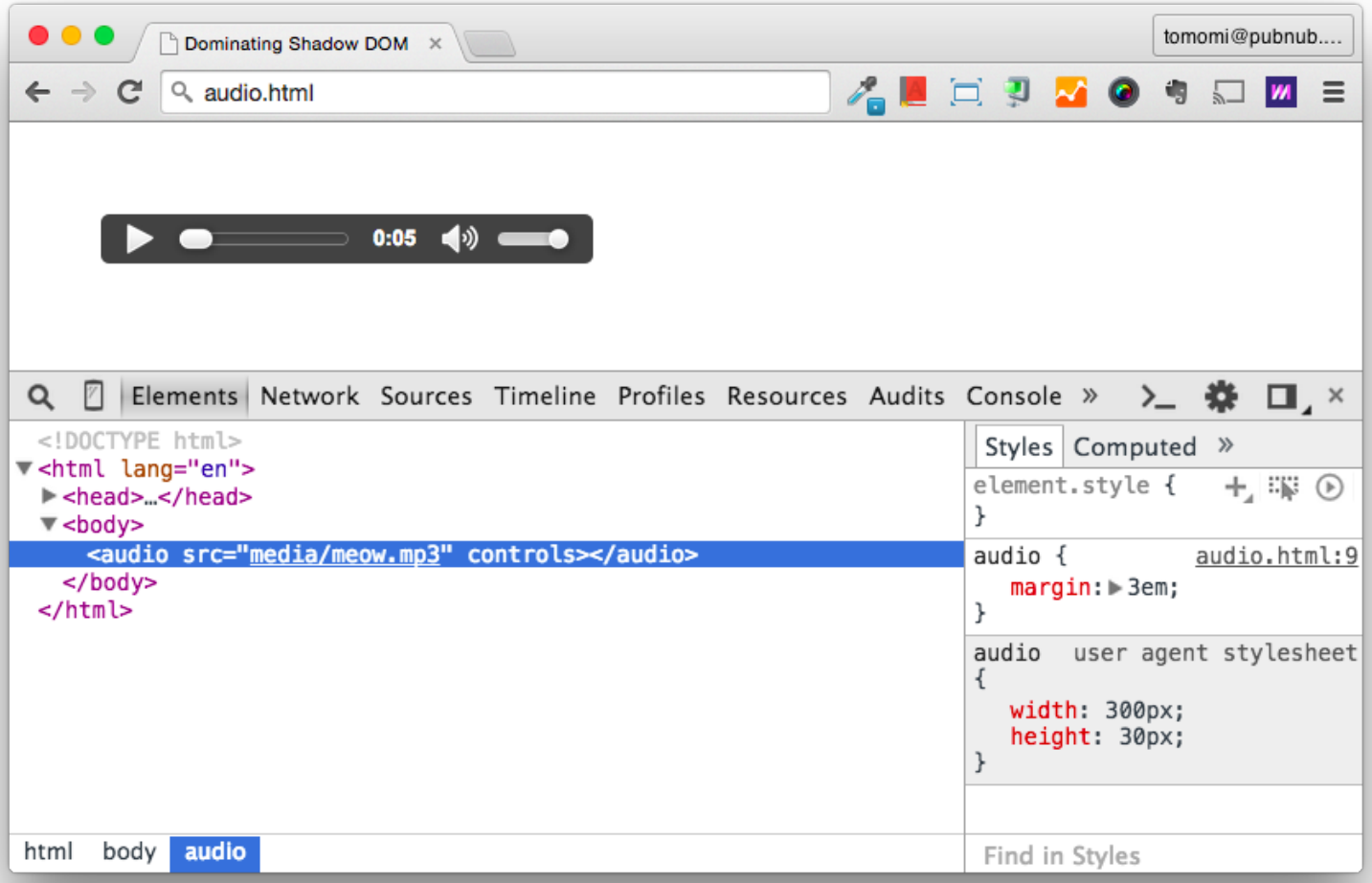
Can I Use?

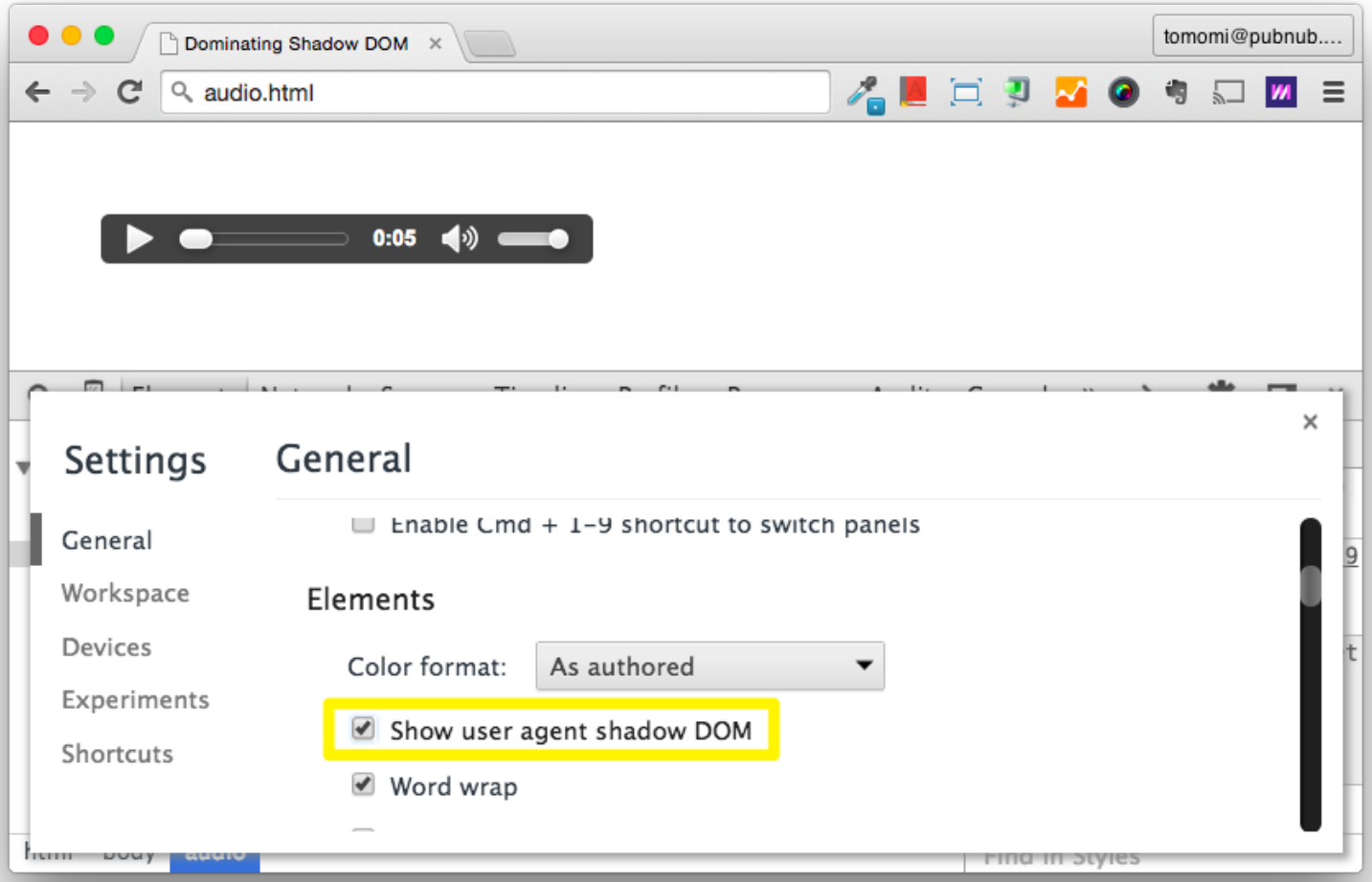
Shadow DOM in Browser

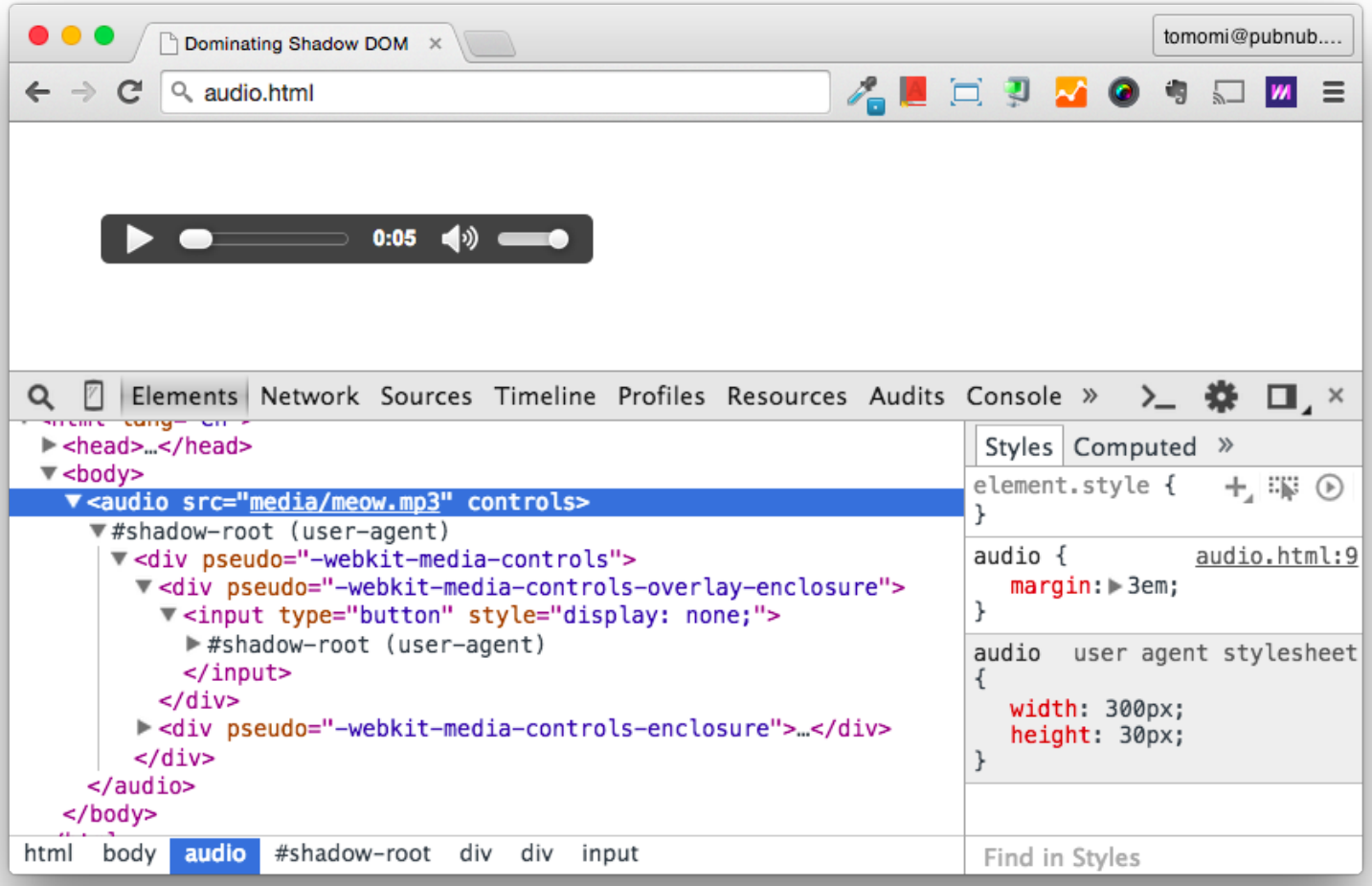
```
<audio src="media/meow.mp3" controls></audio>
```




```
<input type="date">
```


Dominating Shadow DOM
tomomi@pubnub....
audio.html
0:05
Elements
Network
Sources
Timeline
Profiles
Resources
Audits
Console
<!DOCTYPE html>
<html lang="en">
<head>…</head>
<body>
<audio src="media/meow.mp3" controls></audio>
</body>
</html>
Styles
Computed
element.style {
}
audio {
audio.html:9
margin: 3em;
}
audio user agent stylesheet
{
width: 300px;
height: 30px;
}
html
body
audio
Find in Styles


Dominating Shadow DOM
tomomi@pubnub....
audio.html
0:05
Settings
General
Workspace
Devices
Experiments
Shortcuts
General
Enable Cmd + 1-9 shortcut to switch panels
Elements
Color format:
As authored
Show user agent shadow DOM
Word wrap


Dominating Shadow DOM
tomomi@pubnub....
audio.html
0:05
Elements
Network
Sources
Timeline
Profiles
Resources
Audits
Console
<head>…</head>
<body>
<audio src="media/meow.mp3" controls>
#shadow-root (user-agent)

<input type="button" style="display: none;">
#shadow-root (user-agent)
</input>

…

</audio>
</body>
html
body
audio
#shadow-root
div
div
input
Styles
Computed
element.style {
}
audio {
audio.html:9
margin: 3em;
}
audio user agent stylesheet
{
width: 300px;
height: 30px;
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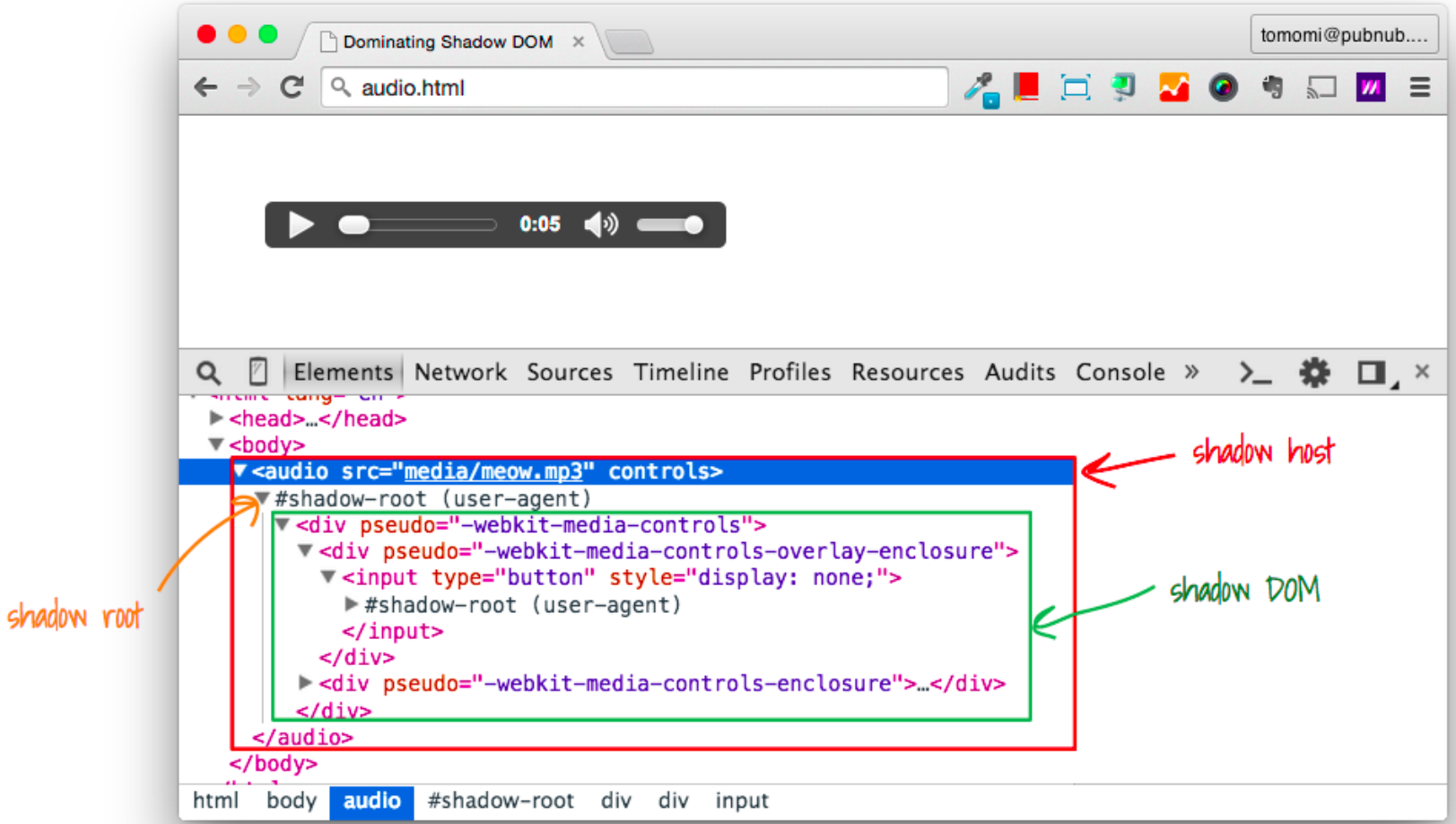
Find in Styles


Dominating Shadow DOM
tomomi@pubnub....
audio.html
0:05
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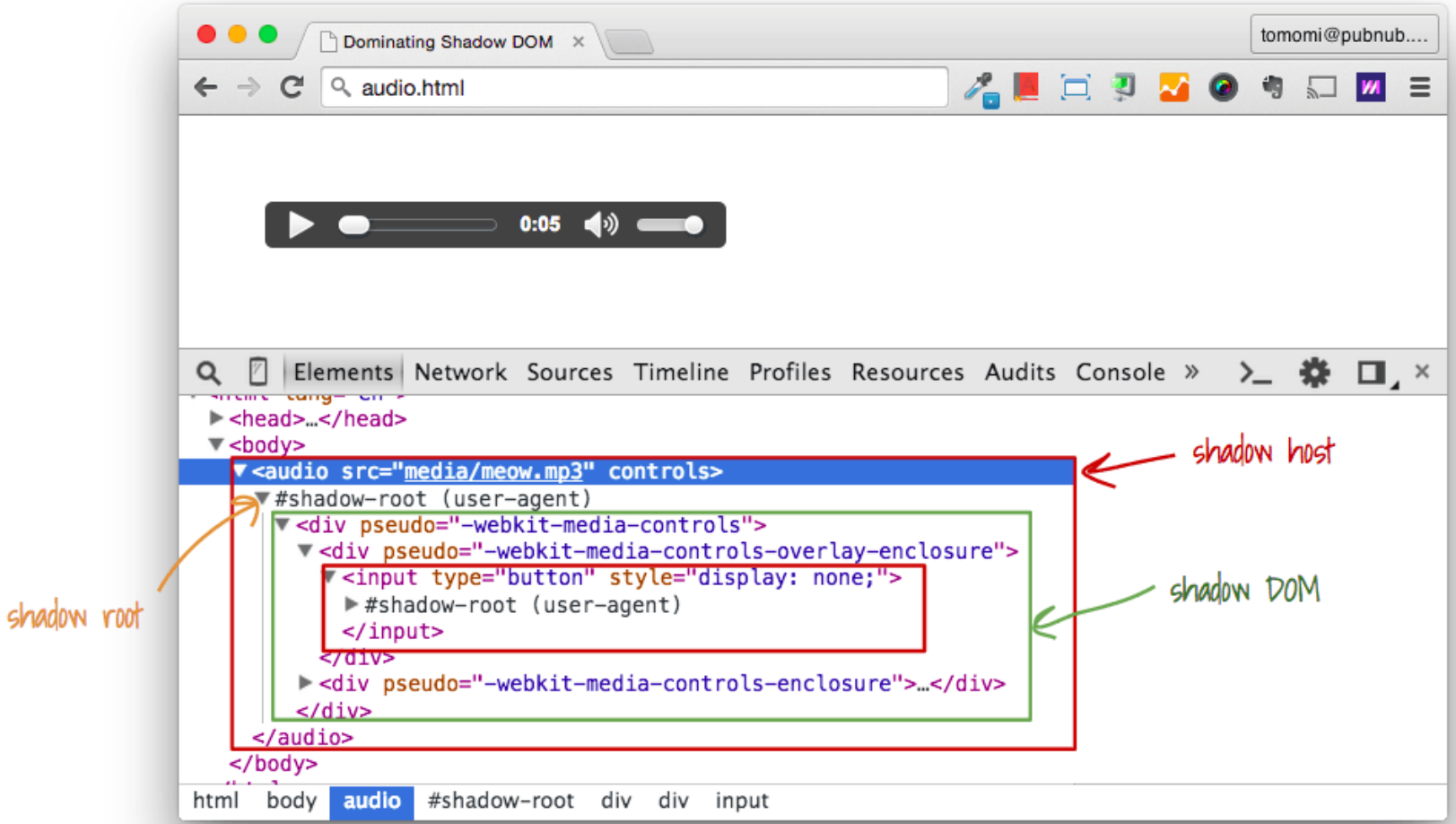
<audio src="media/meow.mp3" controls>
#shadow-root (user-agent)

<input type="button" style="display: none;">
#shadow-root (user-agent)
</input>

…

</audio>
</body>
shadow host
shadow DOM
shadow root
html
body
audio
#shadow-root
div
div
input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tomomi@pubnub....
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0:05
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<head>…</head>
<body>
<audio src="media/meow.mp3" controls>
#shadow-root (user-agent)

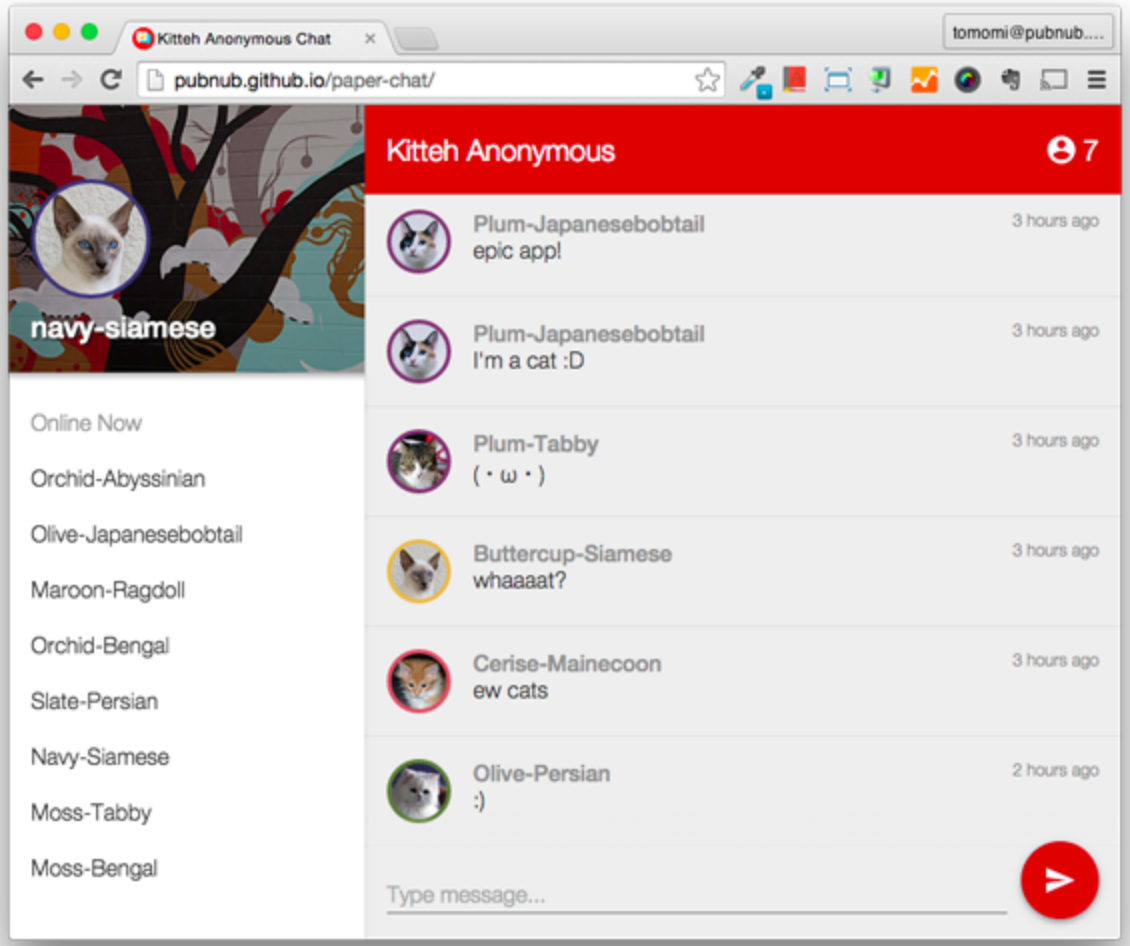
<input type="button" style="display: none;">
#shadow-root (user-agent)
</input>

…

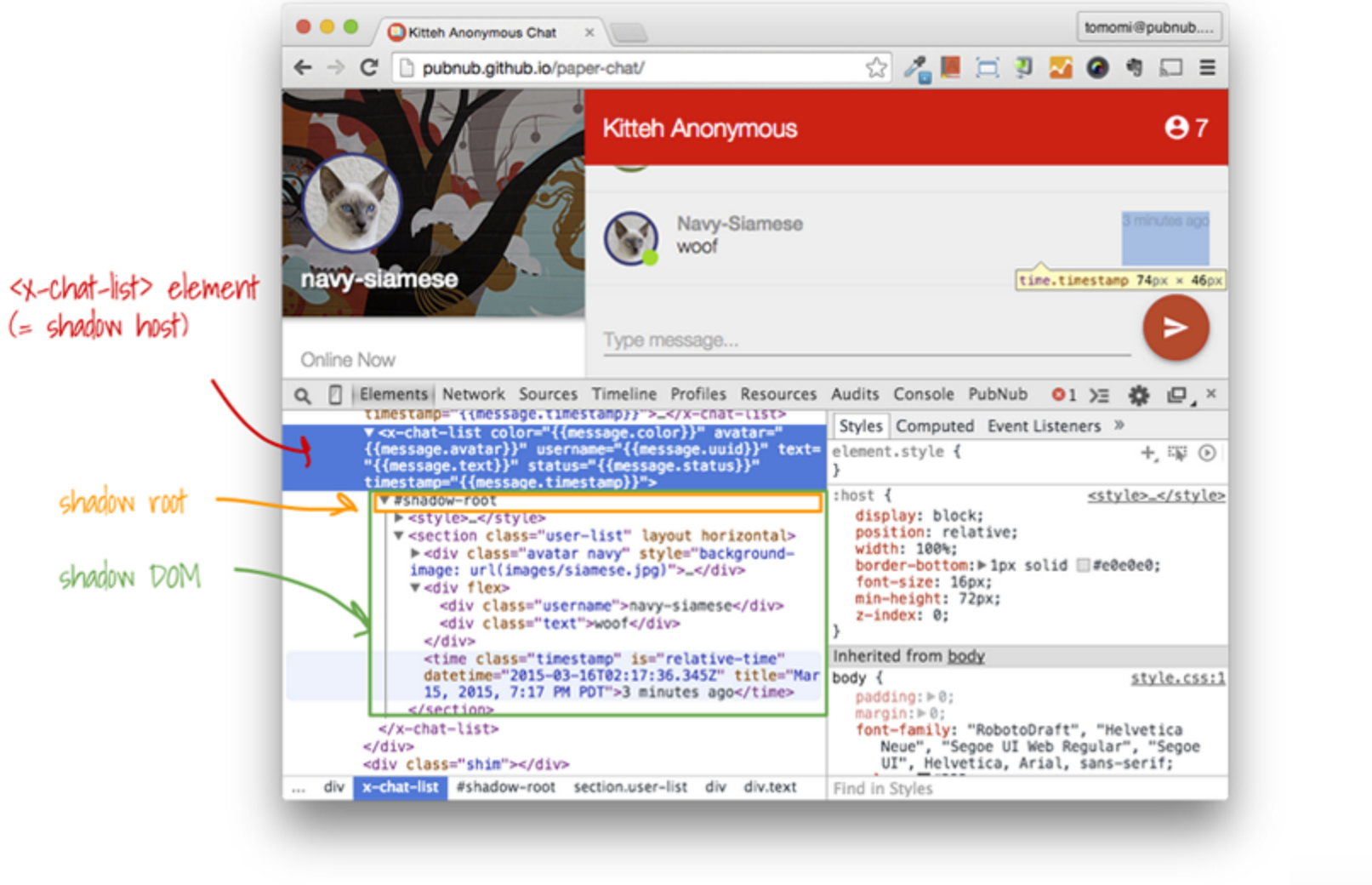
</audio>
</body>
shadow host
shadow DOM
shadow root
html
body
audio
#shadow-root
div
div
input

Custom Elements

```
<x-chat-list
  color="moss" avatar="korat" username="Moss-Korat"
  text="happy moew year to you all"
  timestamp="a minutes ago"></x-chat-list>
```



Kitteh Anonymous (Polymer demo)

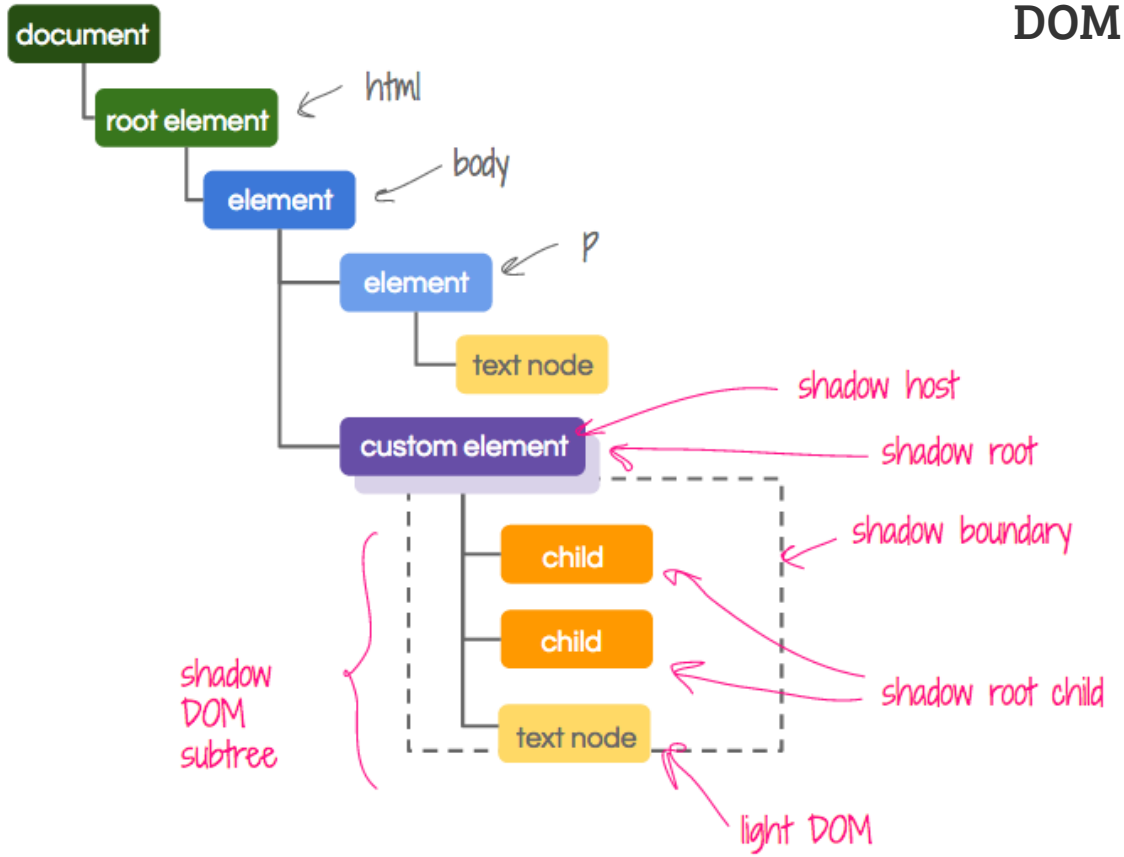


<x-chat-list> element
(= shadow host)
shadow root
shadow DOM
Kitteh Anonymous Chat
tomomi@pubnub....
pubnub.github.io/paper-chat/
Kitteh Anonymous
7
navy-siamese
Navy-Siamese
woof
3 minutes ago
time.timestamp 74px × 46px
Type message...
Online Now
Elements Network Sources Timeline Profiles Resources Audits Console PubNub
Styles Computed Event Listeners
element.style {
}
:host {
<style>…</style>
display: block;
position: relative;
width: 100%;
border-bottom: 1px solid #e0e0e0;
font-size: 16px;
min-height: 72px;
z-index: 0;
}
Inherited from body
body {
style.css:1
padding: 0;
margin: 0;
font-family: "RobotoDraft", "Helvetica Neue", "Segoe UI Web Regular", "Segoe UI", Helvetica, Arial, sans-serif;
Find in Styles
<x-chat-list color="{{message.color}}" avatar="{{message.avatar}}" username="{{message.uuid}}" text="{{message.text}}" status="{{message.status}}" timestamp="{{message.timestamp}}">
#shadow-root
<style>…</style>
<section class="user-list" layout horizontal>
<div class="avatar navy" style="background-image: url(images/siamese.jpg)">…</div>
<div flex>
<div class="username">navy-siamese</div>
<div class="text">woof</div>
</div>
<time class="timestamp" is="relative-time" datetime="2015-03-16T02:17:36.345Z" title="Mar 15, 2015, 7:17 PM PDT">3 minutes ago</time>
</section>
</x-chat-list>
</div>
<div class="shim"></div>
div x-chat-list #shadow-root section.user-list div div.text

Dissecting Custom Elements

- Element → *Shadow Host*
- The root of shadow DOM subtree → *Shadow Root*
- Shadow DOM subtrees → *Shadow DOM*
  - Children
  - Children visible to end user → *Light DOM*

DOM & Shadow DOM



DOM: Creating a Node

```
<div id="parent"></div>

var parent = document.querySelector('#parent');
var child = document.createElement('div');
parent.appendChild(child);
```

Shadow DOM: Creating a Node

```
<div id="host"></div>

var host = document.querySelector('#host');
var shadowroot = host.createShadowRoot();

// To append a child node to the shadow root
var child = document.createElement('div');
shadowroot.appendChild(child);
```

Styling Shadow DOM: CSS Scoping

1. `:host` and `:host()` pseudo-class
2. `:host-context()` pseudo-class
3. `::content` pseudo-element
4. `::shadow` pseudo-element
5. `>>>` shadow-piercing descendant combinator

CSS Scoping Module Level 1 • http://dev.w3.org/csswg/css-scoping/

:host

```
<element name="x-chat-list">
  <style>
    :host {
      border-bottom: 1px solid #eee;
      min-height: 72px;
    }
  </style>
  <div class="username"></div>
  <div class="text"></div>
  <template>...</template>
</element>
```

:host()

```
<element name="x-chat-list" class="fancy">
  <style>
    :host(.fancy) {
      border-bottom: 3px dashed LemonChiffon;
    }
    :host(:hover) {
      color: DarkSlateBlue;
    }
  </style>
  ...
</element>
```

:host-context()

```
:host-context(.fancypants) {
    background-color: LavenderBlush;
}
```

```
<div class="fancypants">
  <x-chat-list></x-chat-list>
</div>
```

::content

```
<element name="x-chat-list">
  <style>
    ::content span {
      font-weight: 400;
    }
  </style>
  <div class="username"><span>User: </span></div>
  <div class="text"></div>
  <template>...</template>
</element>
```

::shadow

```
x-chat-list::shadow > div {
    min-height: 100px;
}
```

```
<x-chat-list>
  #shadow-root
  <div>...</div> <-- this is selected
</x-chat-list>
```

* deprecated in Chrome recently: https://www.chromestatus.com/features/6750456638341120

>>> combinator

Shadow-piercing descendant combinator

```
x-chat-list >>> div { ... }
```

```
<x-chat-list>
  #shadow-root
  <div> <-- all divs are selected incl. nested divs
    <div>
      <div></div>
    </div>
  </div>
</x-chat-list>
```

>>> combinator

```
audio.fancy >>> input[type=range] {
  background-color: CornflowerBlue;
}
```

Actual DOM:

Screenshot:

* Both /deep/ and the combinator are deprecated in Chrome: https://www.chromestatus.com/features/6750456638341120

https://flic.kr/p/8jP4NJ by Ryusuke

Thank you <3 <3 <3

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