

#weirdbrowsers

Weird Browsers

Niels Leenheer
@html5test



HTML5test - How well c X +
html5test.com

HTML5 TEST how well does your browser support html5?
news device lab about the test

your browser other browsers compare

YOUR BROWSER SCORES **485** OUT OF 555 POINTS

You are using Edge 14 on Windows 10

Save results Compare to... Share Donate

semantics

Parsing rules 5

<!DOCTYPE html> triggers standards mode	Yes ✓
HTML5 tokenizer	Yes ✓
HTML5 tree building	Yes ✓
HTML5 defines rules for embedding SVG and MathML inside a regular HTML document. The following tests only check if the browser is following the HTML5 parsing rules for inline SVG and MathML, not if the browser can actually understand and render it.	
inline SVG	Yes ✓

multimedia

Video

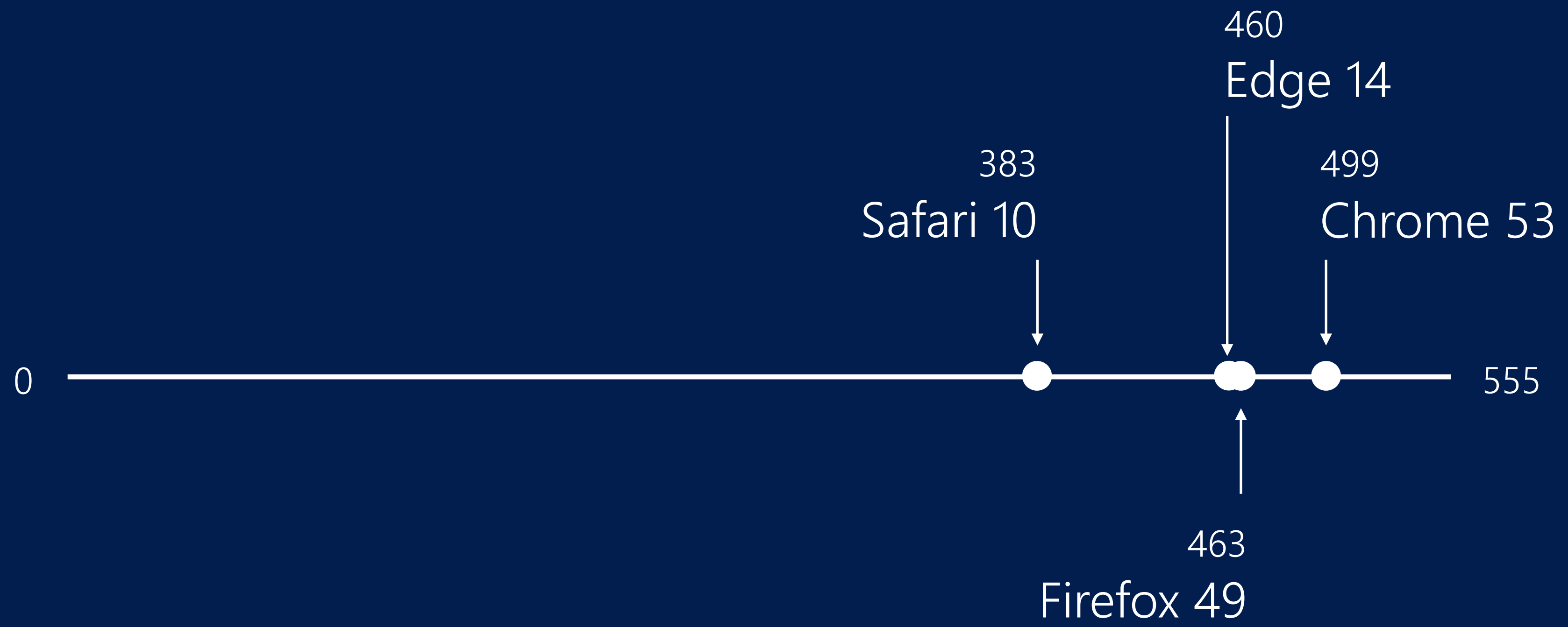
video element

- Subtitles
- Audio track selection
- Video track selection
- Poster images
- Codec detection

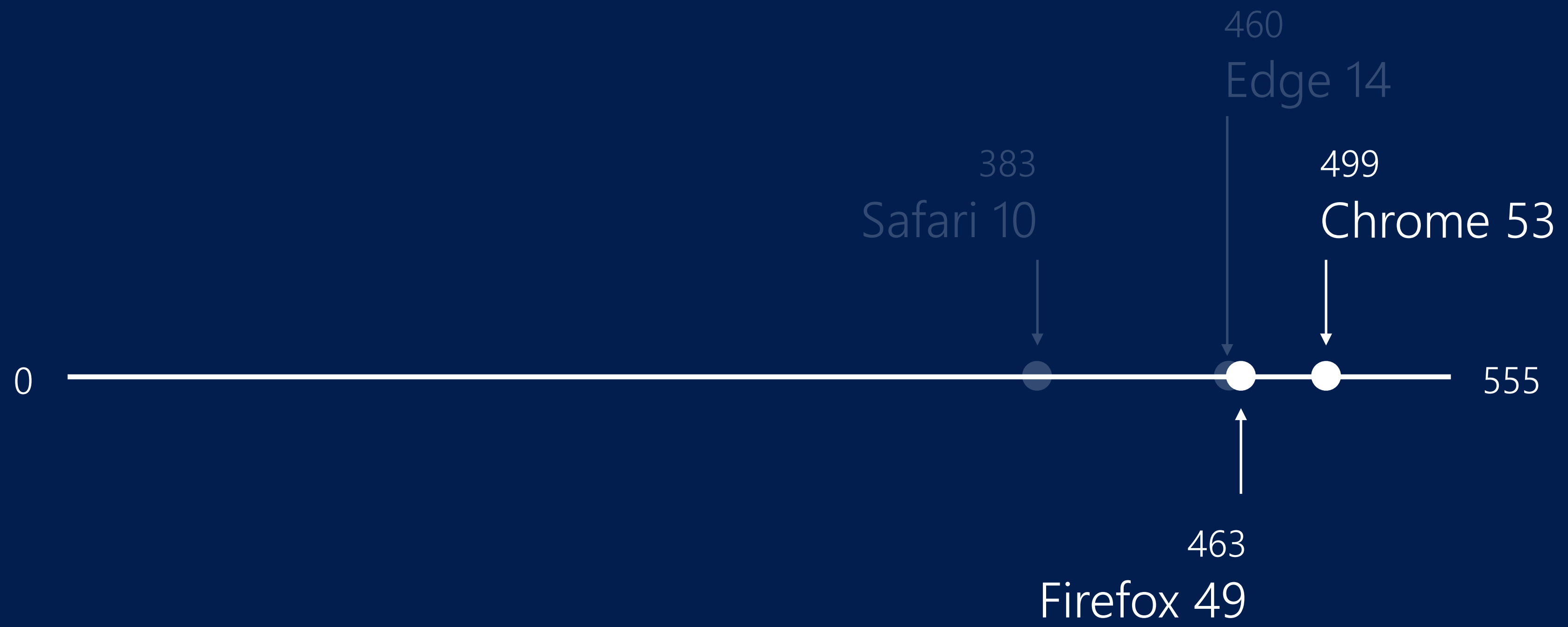
Video codecs

- MPEG-4 ASP support

HTML5 Canvas Diagram Go JS

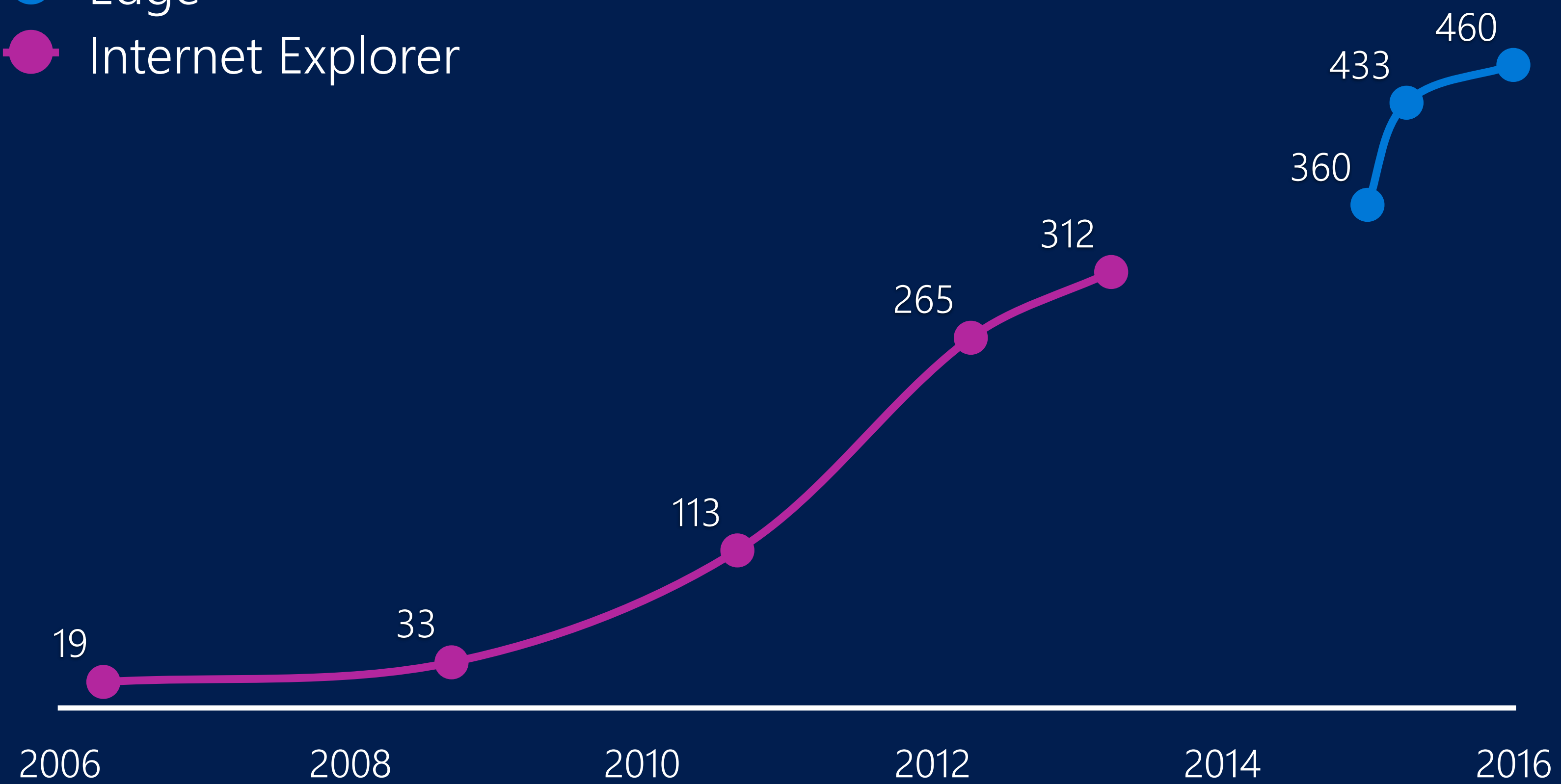


desktop browsers results on html5test.com



desktop browsers results on html5test.com

● Edge
● Internet Explorer



desktop browsers results on html5test.com

new since internet explorer 6

ES6: Promises

Pointerlock

Internationalisation

Blend modes

Video

Full Screen

Device Orientation

Video subtitles

App-cache offline support

Semantic elements

Adaptive streaming

Typed Arrays

Geolocation

Media source extensions

URL API

JSON encoding and decoding

Streams

Page Visibility

WebAuthentication

File API's

Audio

CSS border image

Drag and drop

Responsive images

Mutation Observer

Canvas 2D graphics

Pointer events

IndexedDB

Beacons

ObjectRTC

SVG graphics

Form validation

Web Crypto

HTML5 parser

Color input type

Fetch

Speech synthesis

Navigation Timing

CSS 3D transforms *TLS 1.2* *DOM3 events* *Native XMLHttpRequest* *CSS animations*

Screen orientation *WOFF fonts* *Sandboxed iframes* *CSS transforms* *ARIA*

CSS Selectors *PNG transparency support* *WebDriver* *CSS transitions*

Image sourceset *Data URLs* *HSTS* *Content security policy* *CSS Gradients*

Regions *CSS Snap Points* *High Resolution Timing* *VP9 video codec*

CSS Grid Layout *SVG External content*

Selection API *CSS calc* *XPath* *ES6: WeakMap* *CSS opacity* *Touch events*

ES6: Generators IME API ES6: Subclassing HTTP/2 server push ES6: Template strings

Canvas 2D Path ES6 Classes Date input types Async script execution CSS unset

Access the webcam

ECMAScript 5 CSS Multicolumn Cross-origin Resource Sharing

Message Channels WebAudio WebGL

Session history Web Sockets

Gamepad Web Workers

Session storage Notifications Local storage

HTTP/2 Cross-document messaging Exclusions

ASM.js CSS Filters Device Motion

WebRTC CSS Flexbox

Media Queries Level 4 ES6: Arrow functions Console logging

Encrypted Media Extensions

weird browsers

no, this talk is not about internet explorer 6



the web is weird by definition

the web is not a single platform

weird browsers

weird browsers?

game consoles



portable
game consoles



smart tvs



e-readers



smartwatches



photo cameras



fridges



cars



vr headsets



*smart tvs and
game consoles*

“big screen browsers”

A red Sony KDL-68S8000 television set is shown. A red price tag is attached to the top left corner of the screen. The tag contains the following text: "SONY", "KDL-68S8000", "68cm (27.16") Widescreen LCD TV", "Model No. KDL-68S8000", "MSRP \$1,999.99", "Now \$1,349.99", "Save \$650.00", and "3499.-". The price "3499.-" is written in large, bold, black numbers. The Sony logo is visible in the bottom right corner of the screen.

SONY
KDL-68S8000
68cm (27.16") Widescreen LCD TV
Model No. KDL-68S8000
MSRP \$1,999.99
Now \$1,349.99
Save \$650.00
3499.-

Do 30 Jan 2014 23:00

Sony KD65X8505BBAEP

Eukarya gracilis	60 inch / 154 cm / 1W FULL HD LED TV
-------------------------	--------------------------------------

[illegible]

€2799.-

€ 24 99,-

RETURN Stop

Herhalen: Alle clip

[illegible]

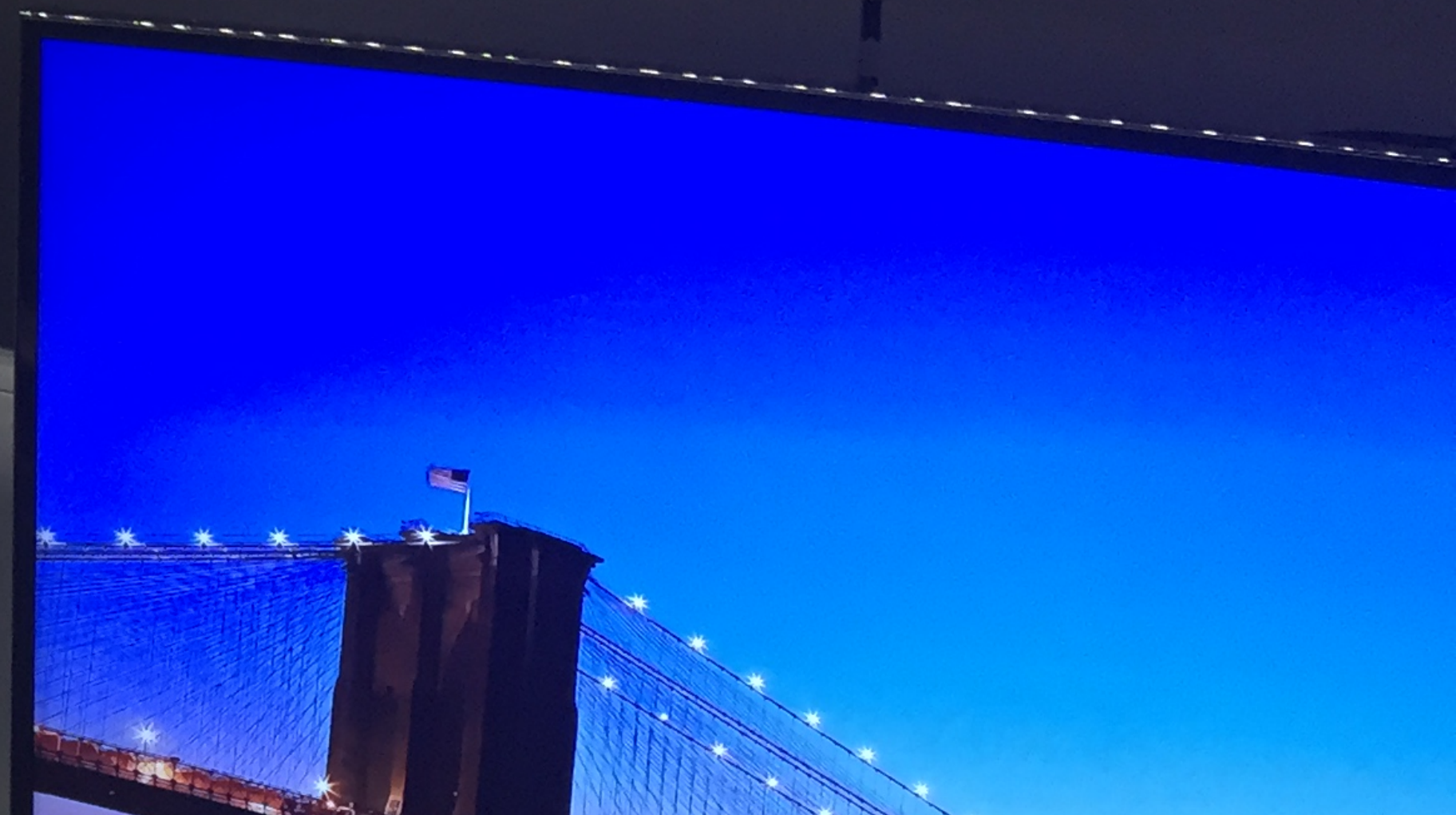
Nu bijwerken

TV-software bijwerken...

Uw tv schakelt zichzelf na de update automatisch uit en weer aan.

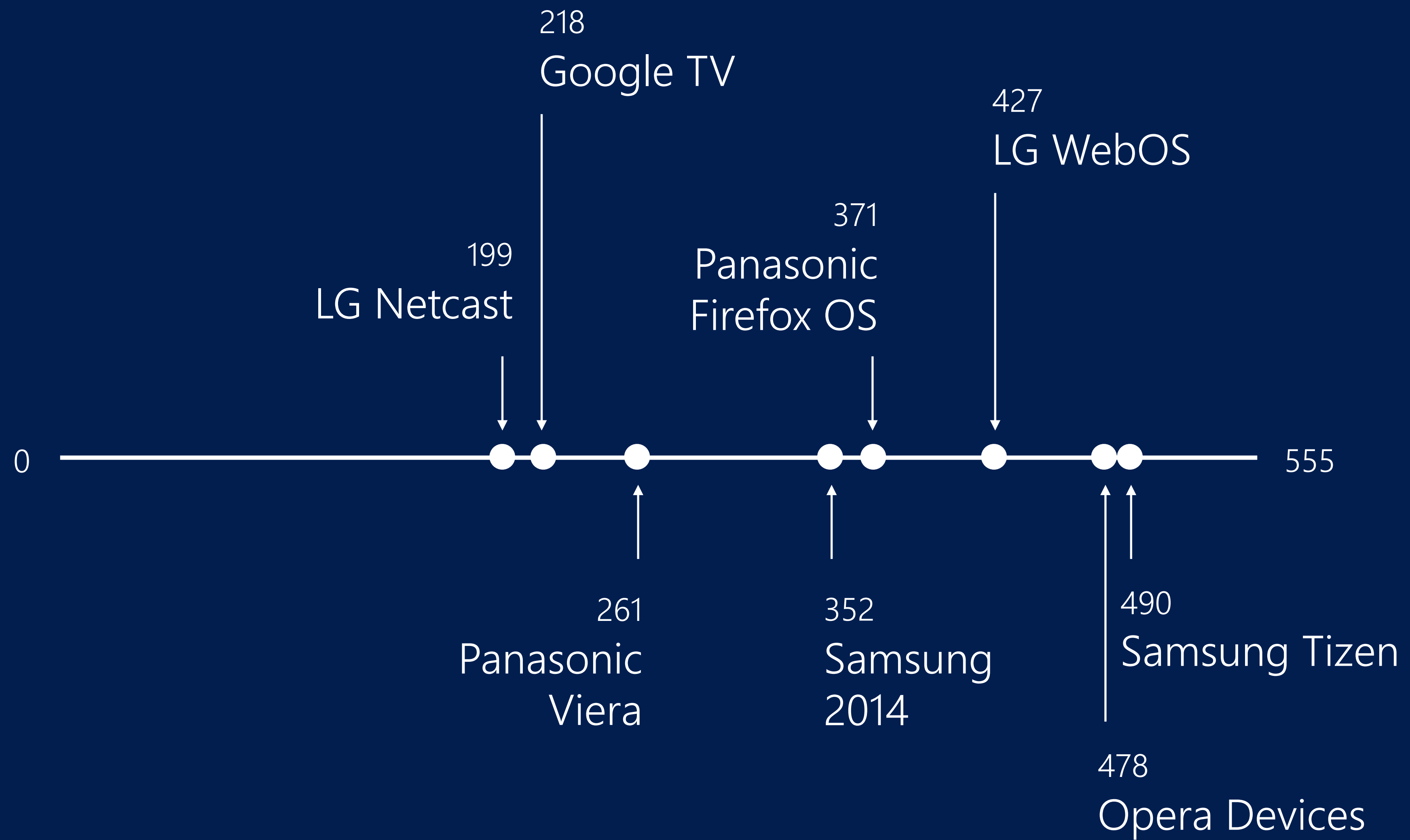
Annuleren

33 %

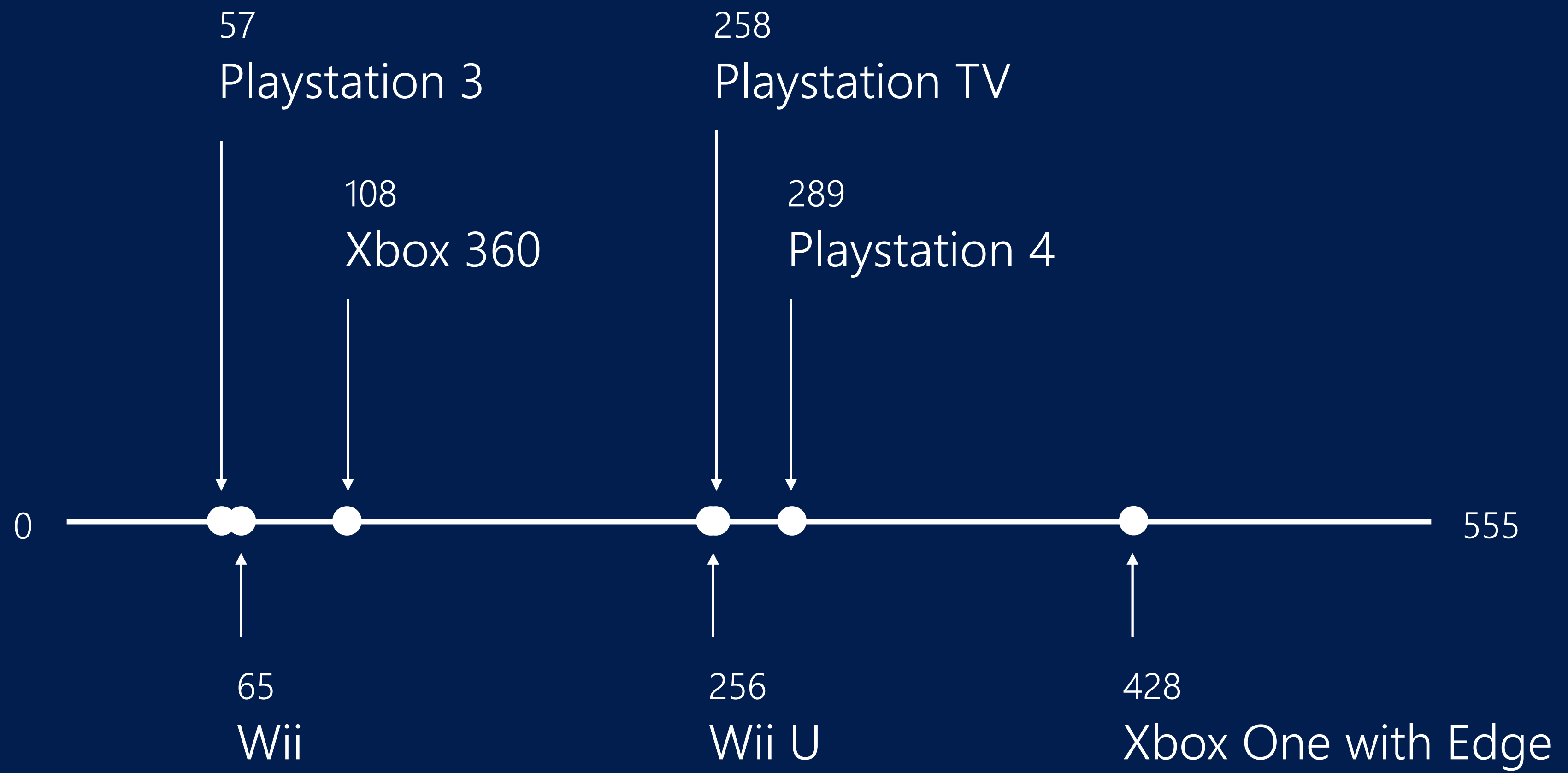


television browsers are pretty good

the last generation of television sets use
operating systems that originate on mobile



smart tv results on html5test.com



console results on html5test.com

1

controlling the browser

the biggest challenge of
of big screen browsers

navigation

(without mouse or touchscreen)

d-pad



d-pad



alternatives

analog controllers



remotes
with trackpad



remotes
with airmouse



second screen



many manufacturers also create apps for
controlling the smart tv, console or set-top box

HTML5TEST

how well does your browser support html5?

your browser

other browsers

compare

news

device lab

about the test

YOUR BROWSER SCORES

428

OUT OF 555 POINTS

**<MultiBrowser>**
Responsive, Mobile & Cross Browser Testing with Real Browsers, locally!

You are using Edge 14 on a Microsoft Xbox One running Windows 10

Correct? ☒ ☐

Save results

Compare to...

Share

Donate

 semantics

Parsing rules

5

<!DOCTYPE html> triggers standards mode

Yes

☒

HTML5 tokenizer

Yes

☒

HTML5 tree building

Yes

☒

HTML5 defines rules for embedding SVG and MathML inside a regular HTML document. The following tests only check if the browser is following the HTML5 parsing rules for inline SVG and MathML, not if the browser

 multimedia

Video

33

video element

Yes

☒

Subtitles

Yes

☒

Audio track selection

Yes

☒

Video track selection

Yes

☒

Poster images

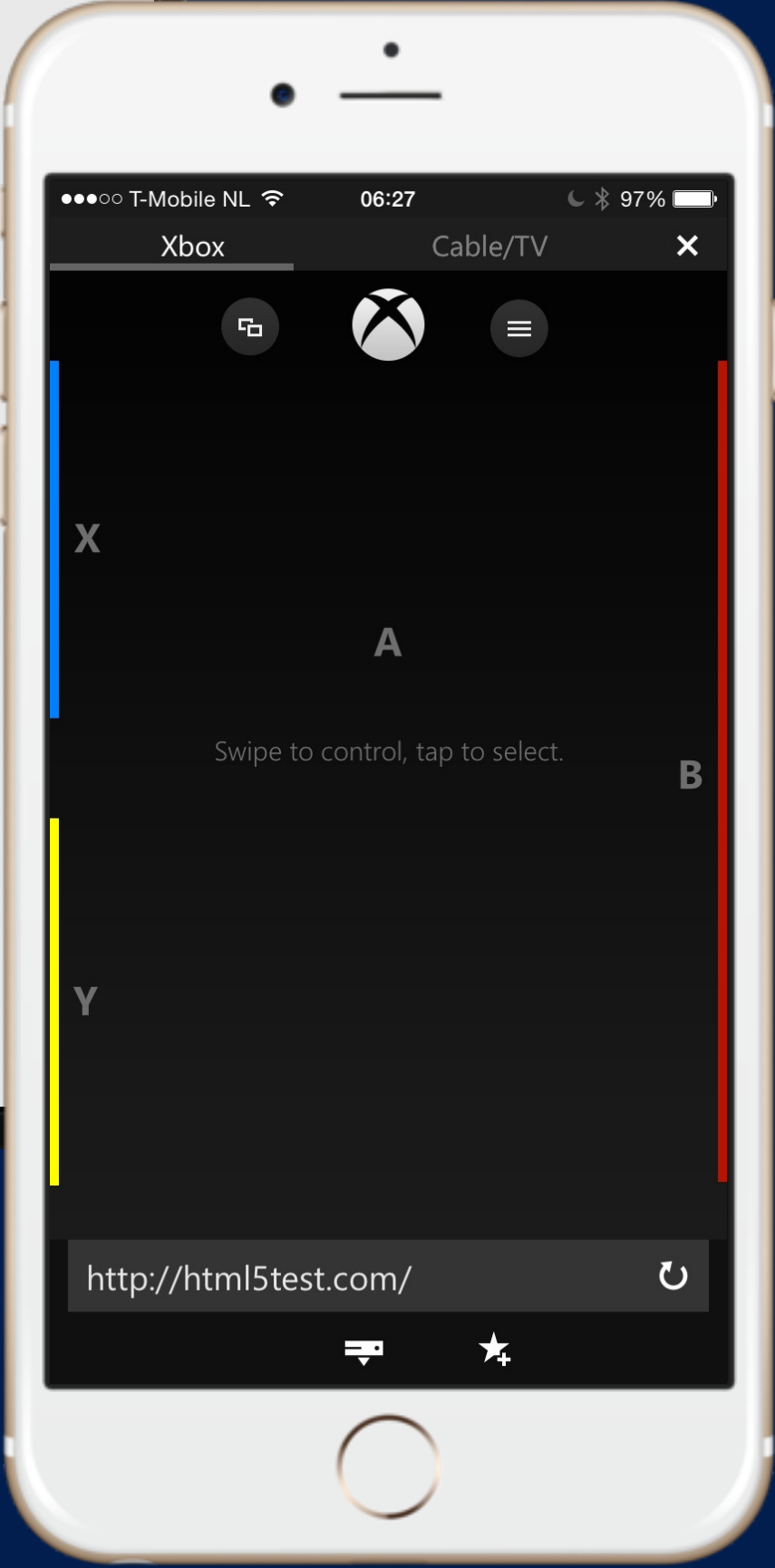
Yes

☒

Codecs detection

Yes

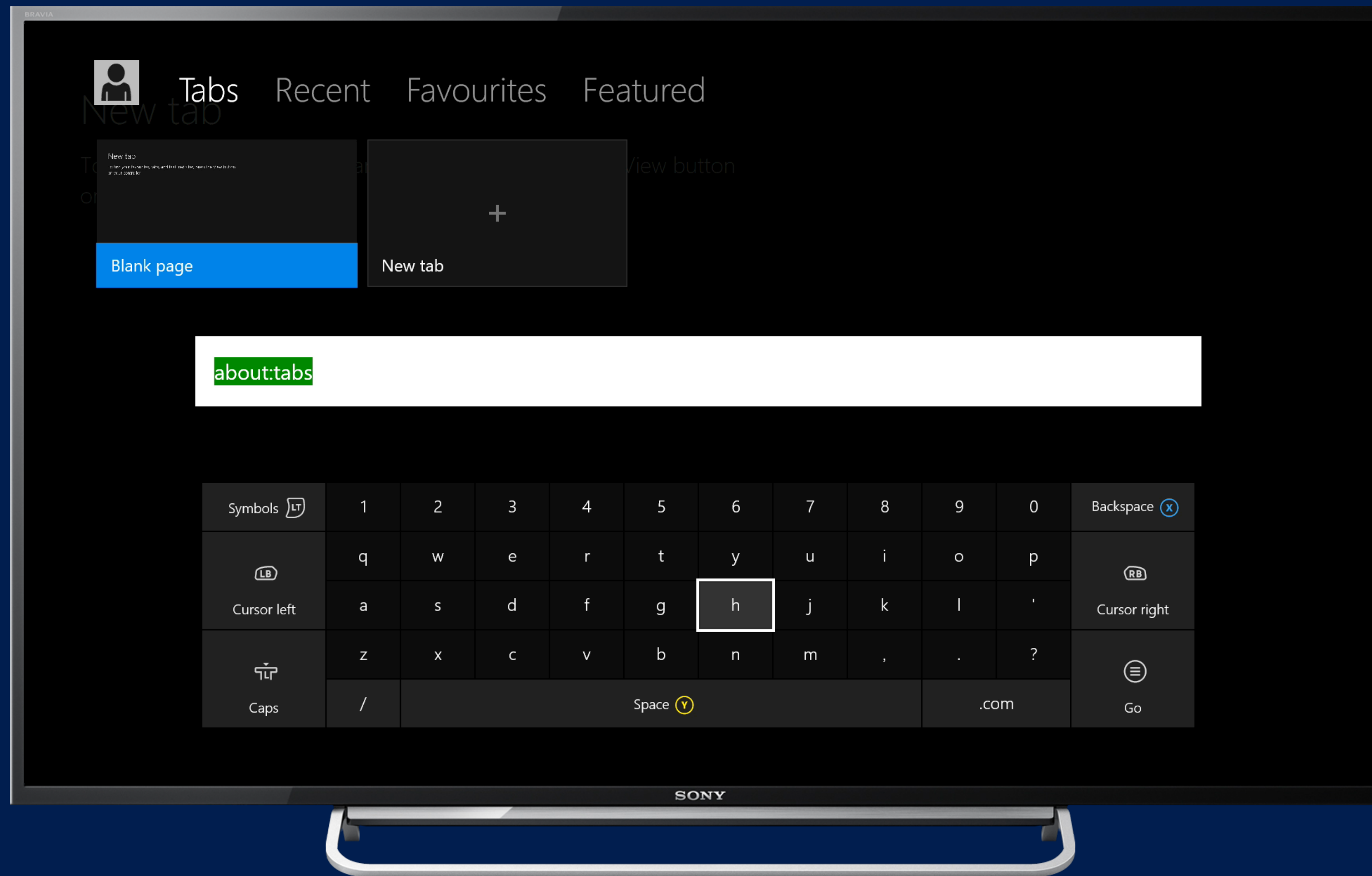
☒



text input
(without keyboard)

d-pads





text input with the d-pad

alternatives

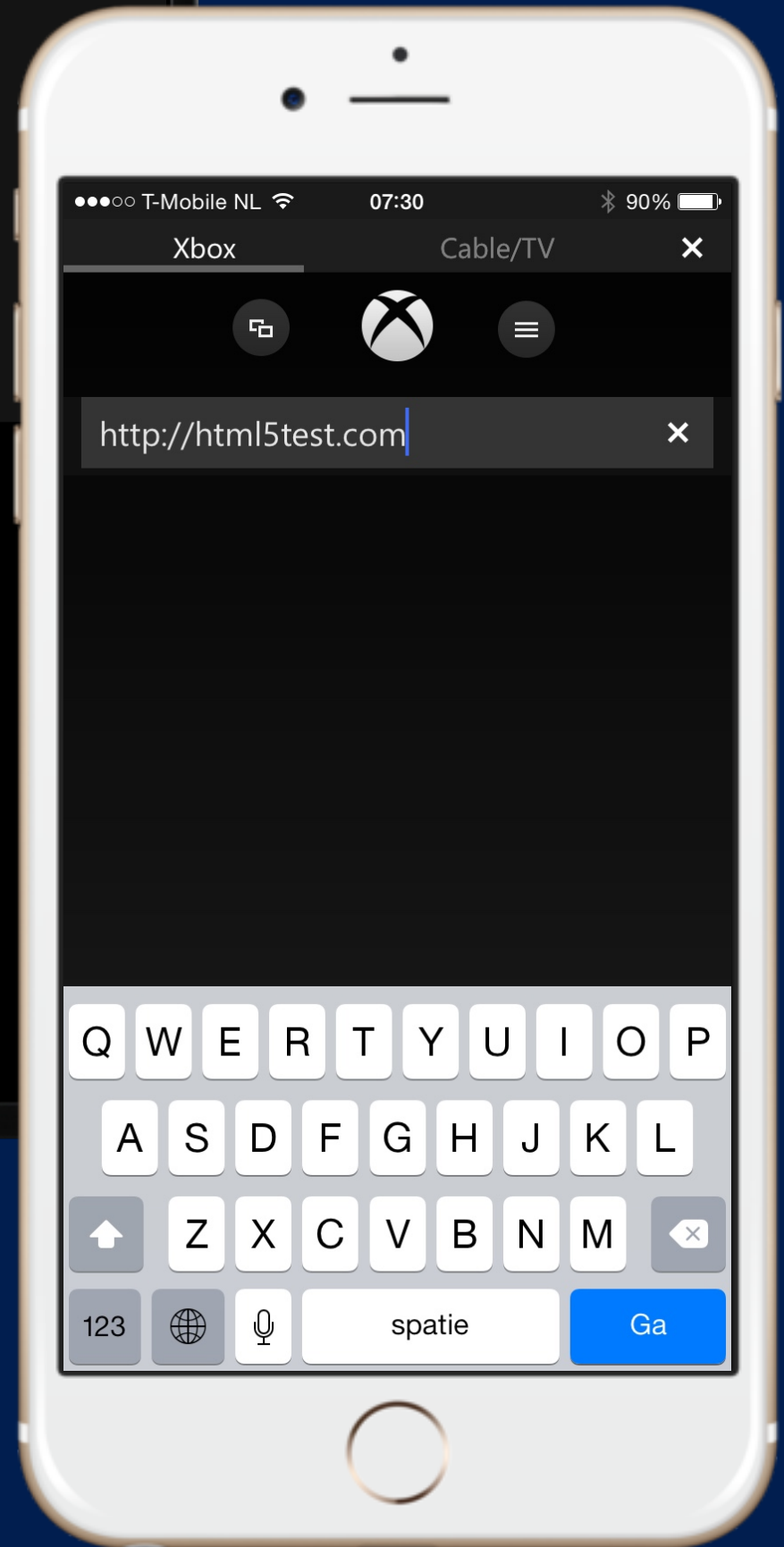
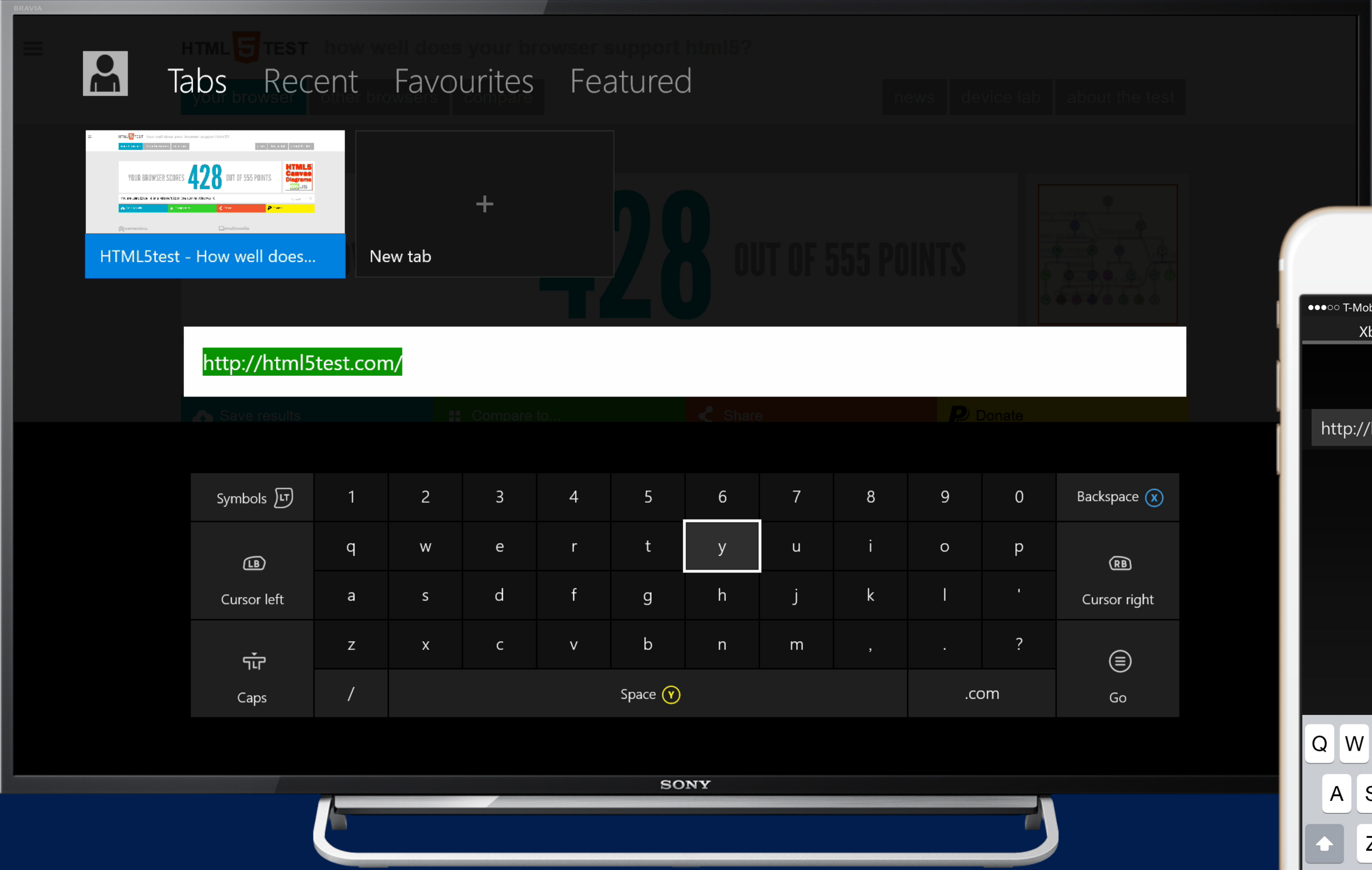
remotes
with keyboards



wireless keyboards

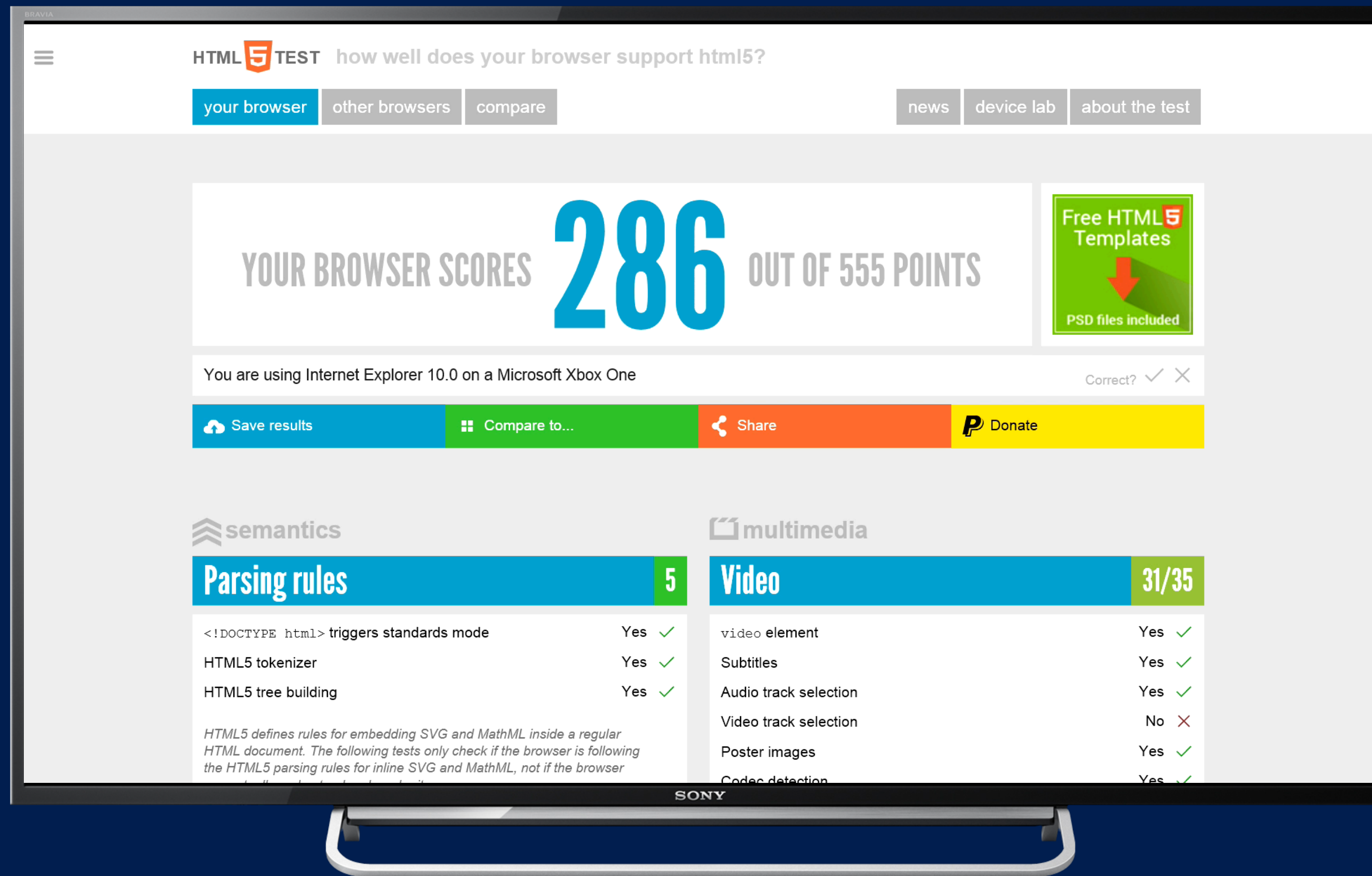


and apps



gesture control

*(throw your hands up in the air,
and wave 'em like you just don't care)*



navigation with gesture control

can we control these input methods
directly from javascript?

the d-pad
maybe

1

keyboard events

```
window.addEventListener("keypress", function(e) {  
    e.preventDefault(); // no navigation  
    ...  
});
```


the gamepad
maybe

1

the gamepad api

```
var gamepads = navigator.getGamepads();  
for (var i = 0; i < gamepads.length; i++) {  
    ...  
}
```


the webcam
maybe

1

the getUserMedia api

```
navigator.getUserMedia(  
  { audio: true, video: { width: 1280, height: 720 } },  
  function(stream) { ... },  
  function(error) { ... }  
);
```


2

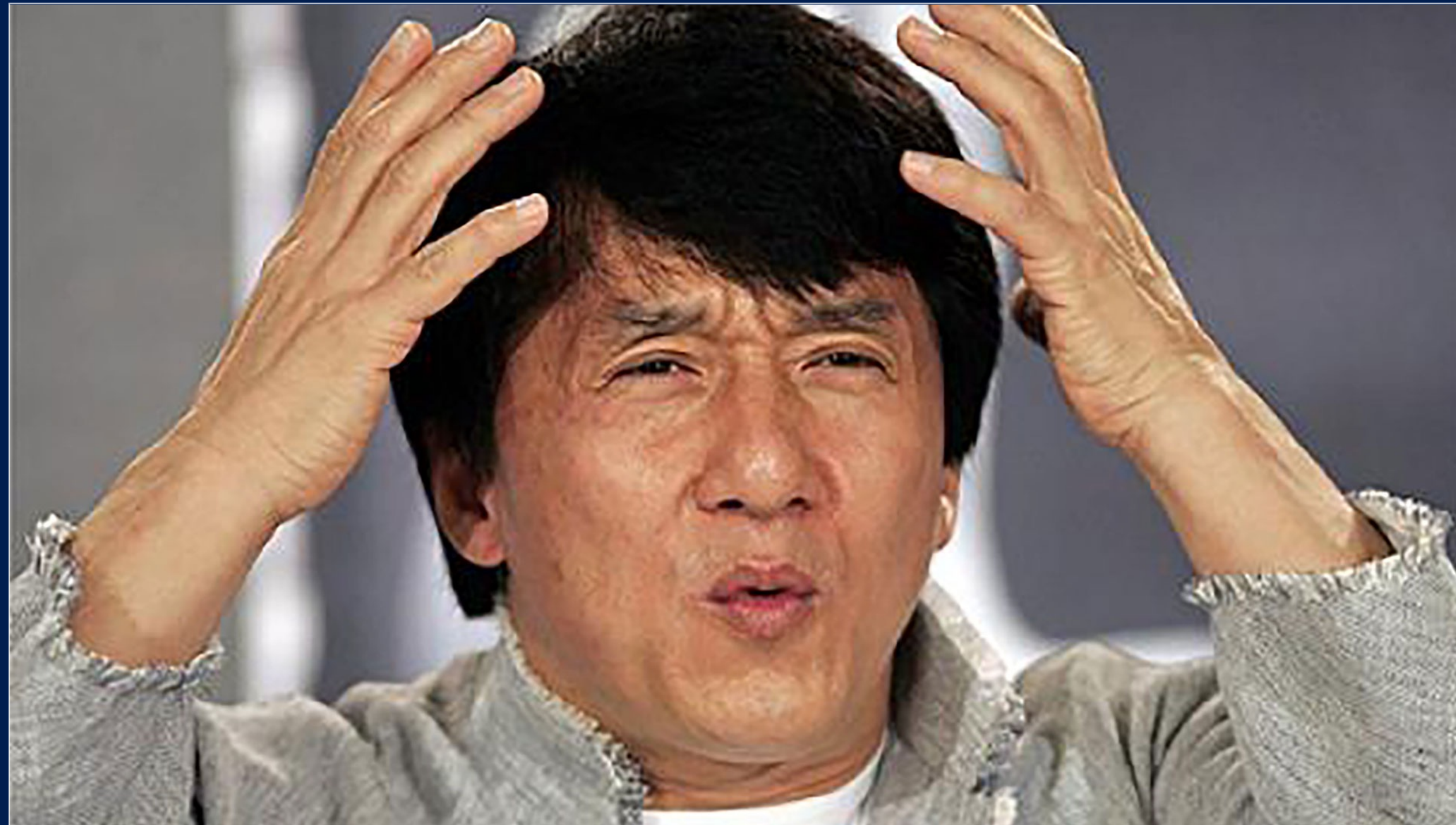
***the difference between
a television and a monitor***

overscan

(let's make it a bit more complicated)

due to historical reasons televisions will
not show the borders of the image

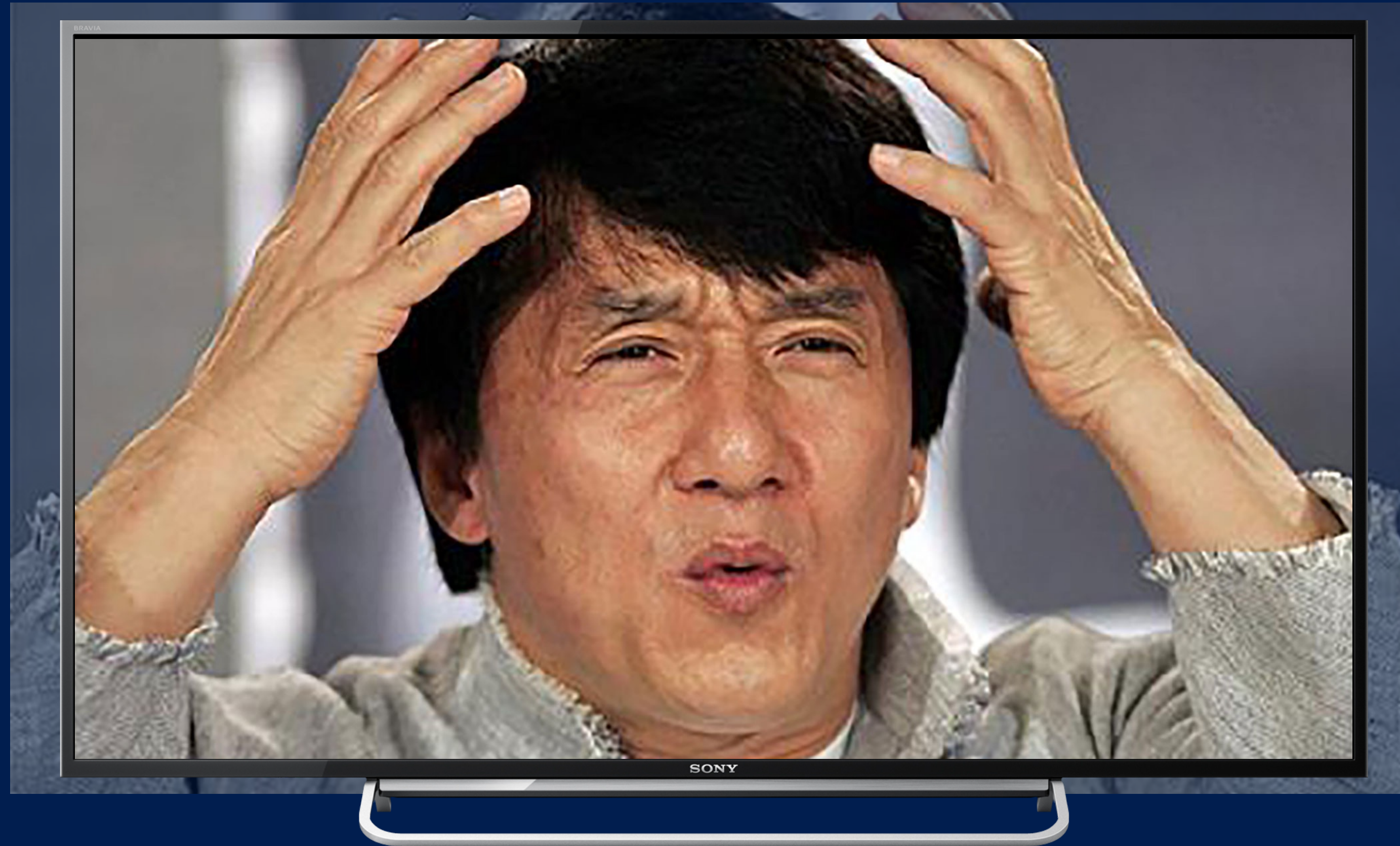
1920 pixels



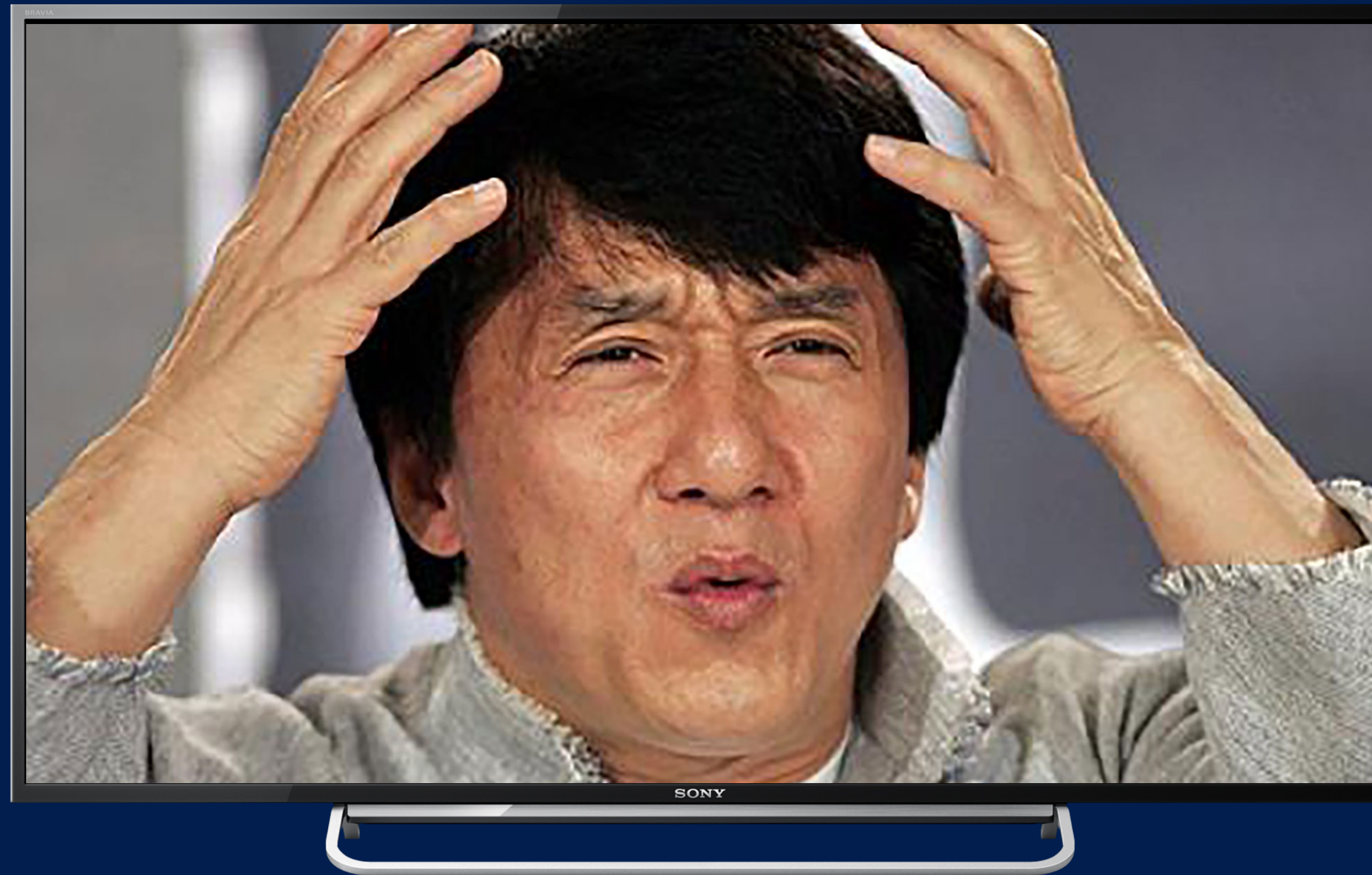
the television enlarges all images
from the hdmi input by 5%



the television enlarges all images
from the hdmi input by 5%

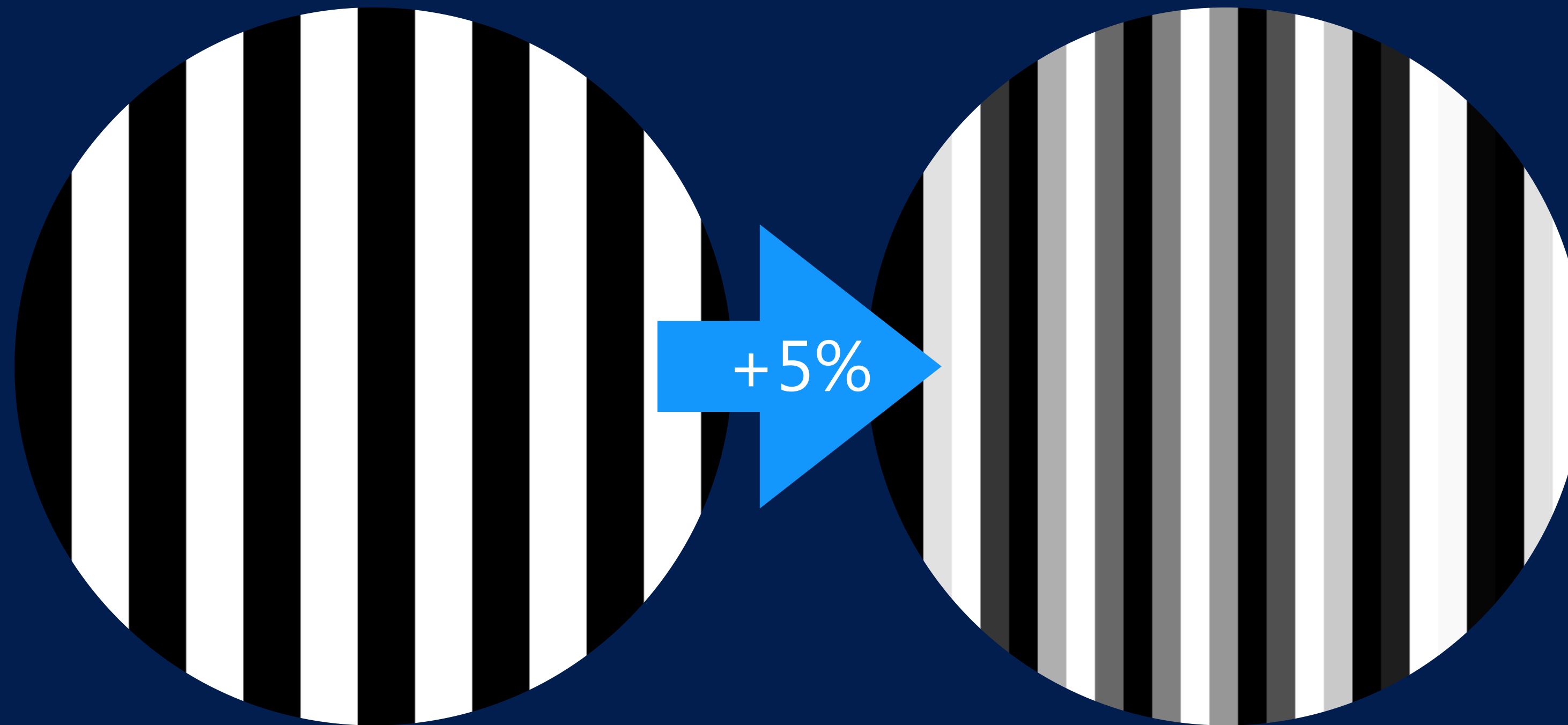


the image is then cropped to
1920 by 1080 pixels



the image is then cropped to
1920 by 1080 pixels

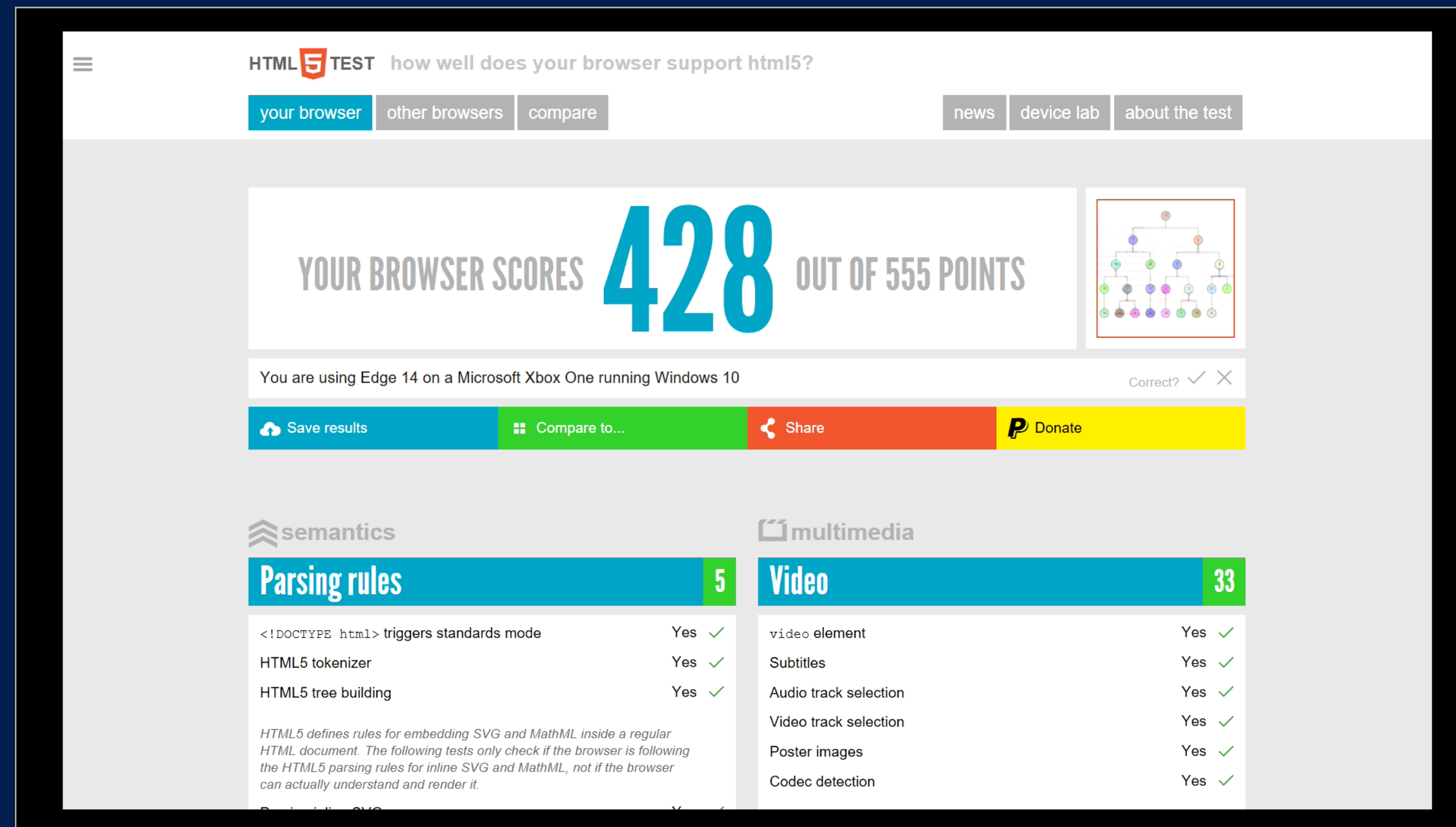
overscan causes blurry output



solution 1

overscan correction

1920 pixels



the browser does not use
the edges of the image

1920 pixels

HTML5 TEST how well does your browser support html5?

your browser other browsers compare news device lab about the test

YOUR BROWSER SCORES **428** OUT OF 555 POINTS

You are using Edge 14 on a Microsoft Xbox One running Windows 10 Correct? ✓ ✕

Save results Compare to... Share Donate

semantics

Parsing rules 5

<!DOCTYPE html> triggers standards mode	Yes	✓
HTML5 tokenizer	Yes	✓
HTML5 tree building	Yes	✓

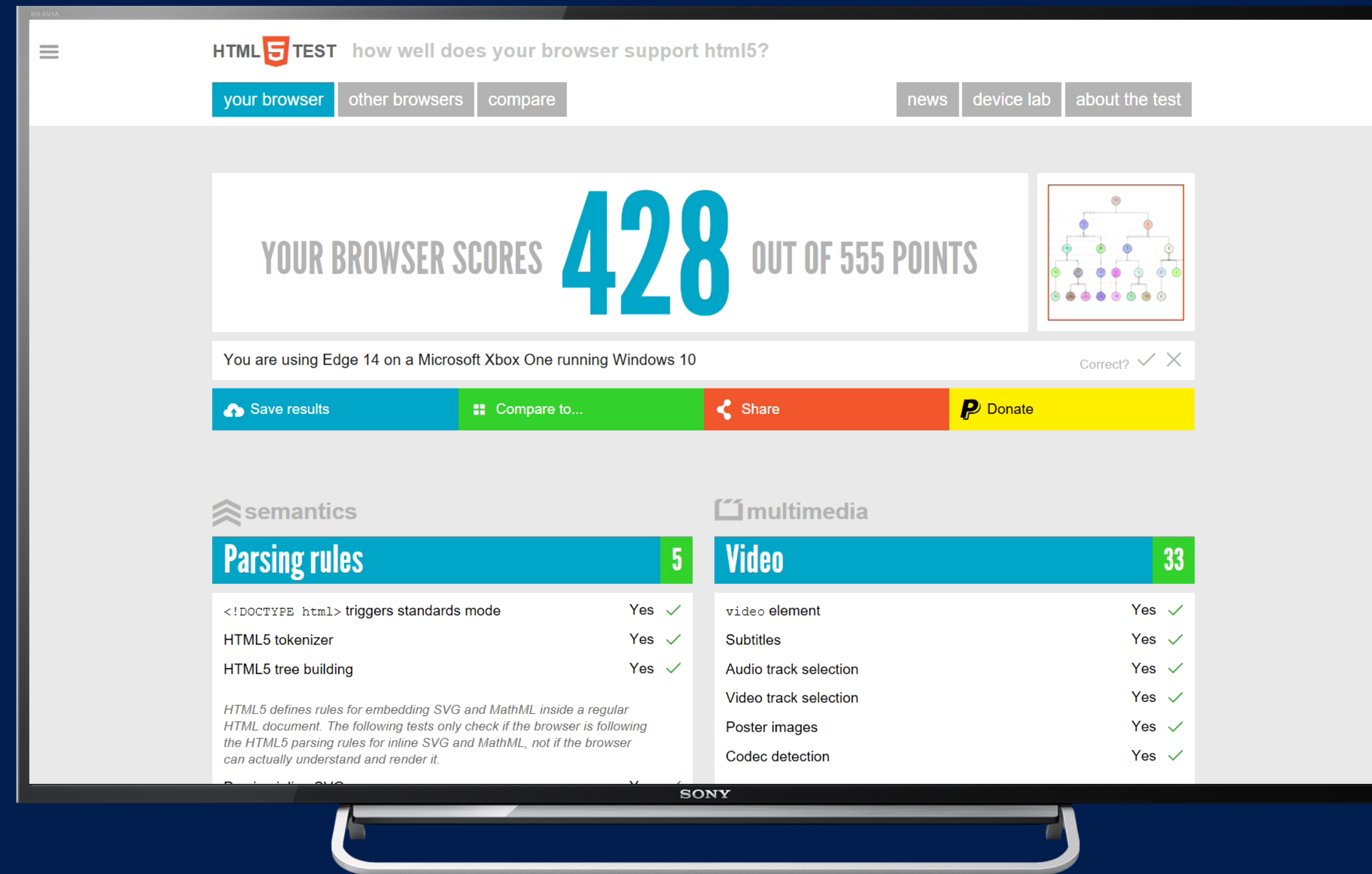
HTML5 defines rules for embedding SVG and MathML inside a regular HTML document. The following tests only check if the browser is following the HTML5 parsing rules for inline SVG and MathML, not if the browser can actually understand and render it.

multimedia

Video 33

video element	Yes	✓
Subtitles	Yes	✓
Audio track selection	Yes	✓
Video track selection	Yes	✓
Poster images	Yes	✓
Codec detection	Yes	✓

the television will enlarge
the image by 5%



and the content is now fully visible, the unused border is cropped out of the final image

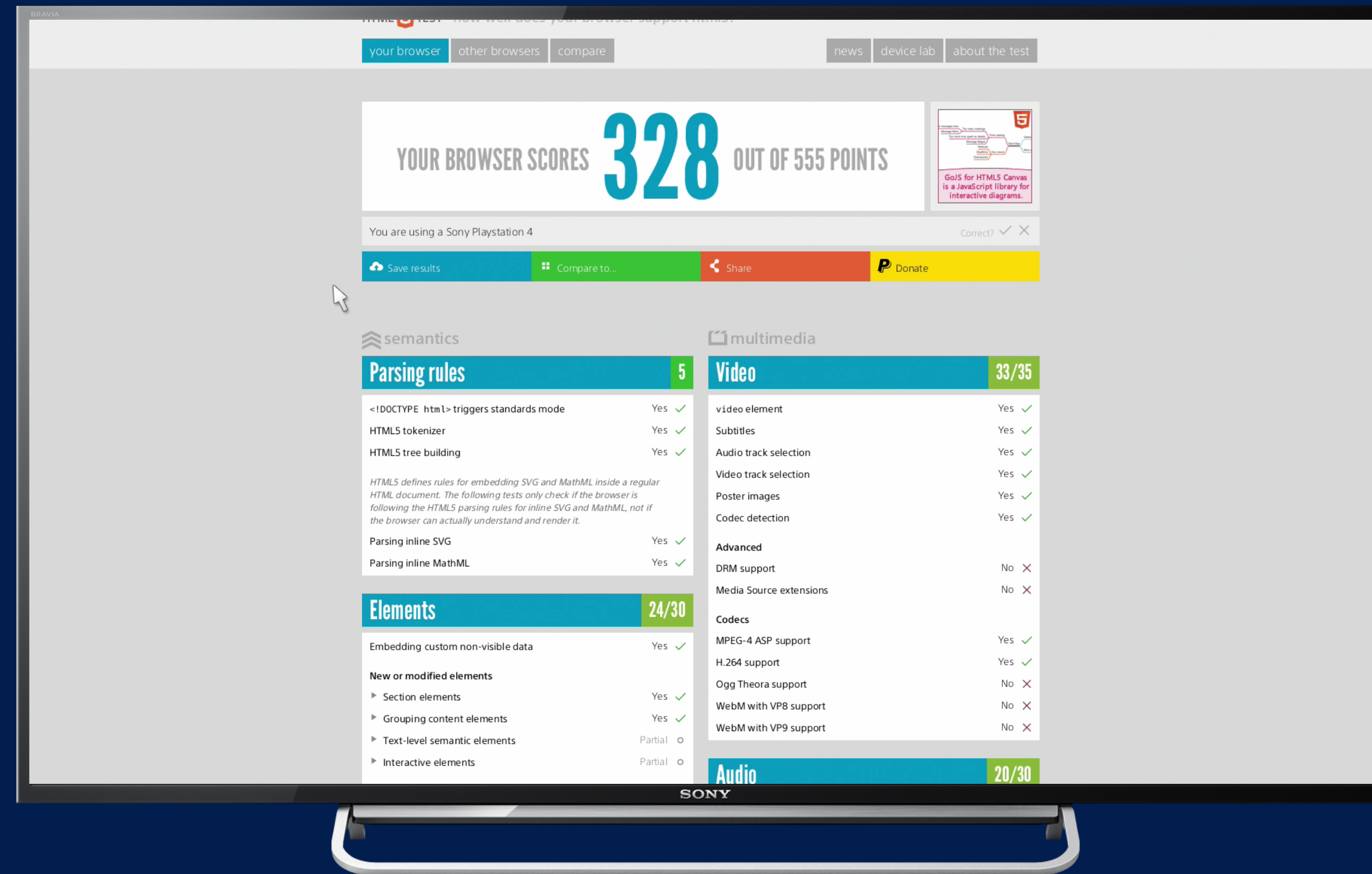
but not every television set enlarges the image by exactly 5%, this can vary between manufacturers and models



configure the correct overscan correction
in the system preferences



the playstation 4 will always show the browser without overscan correction in full screen mode



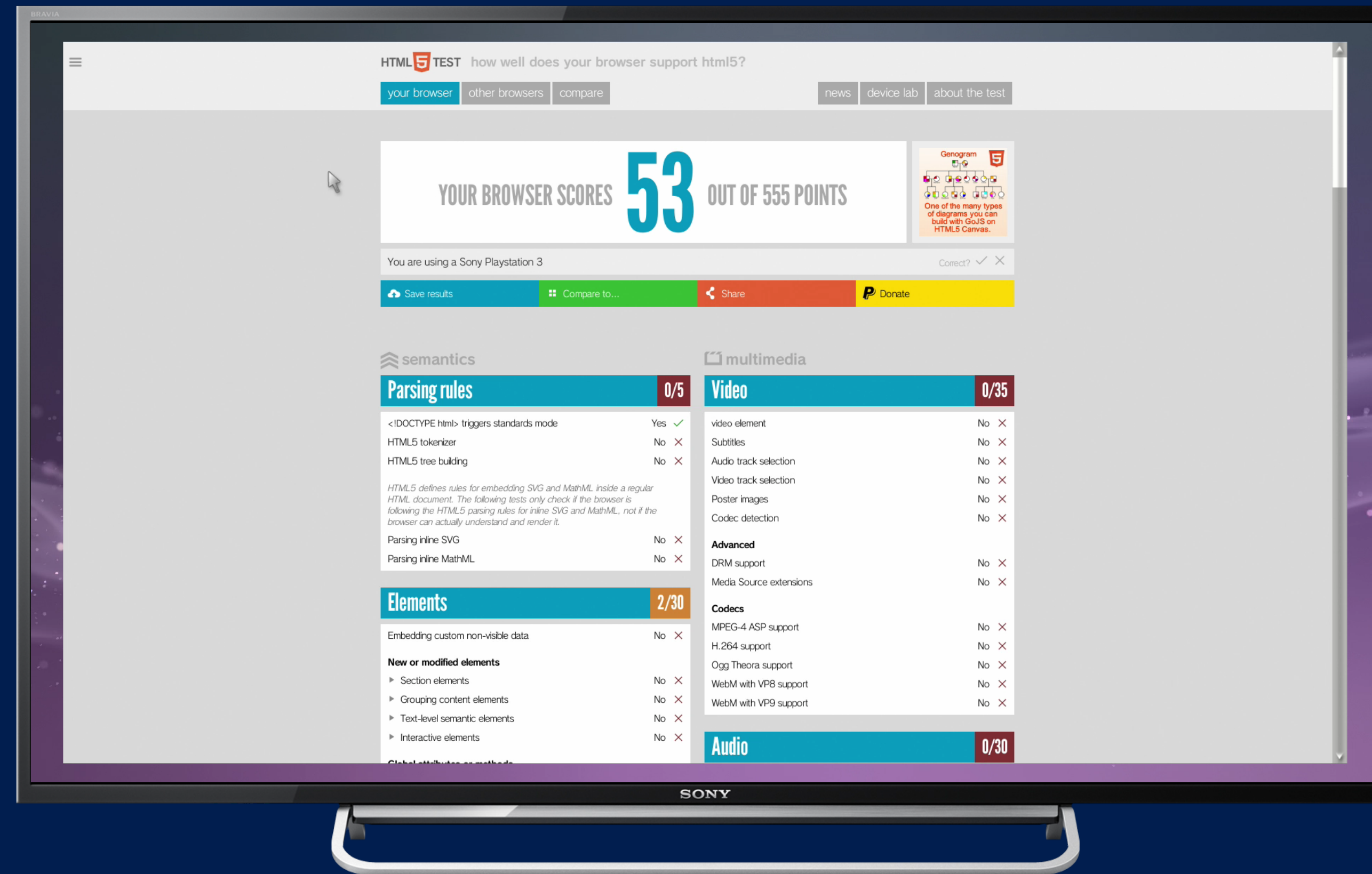
the playstation 4 will always show the browser without overscan correction in full screen mode

solution 2

no overscan

it is possible to disable overscan
on many television sets

'screen fit', 'pixel perfect' or 'just scan'



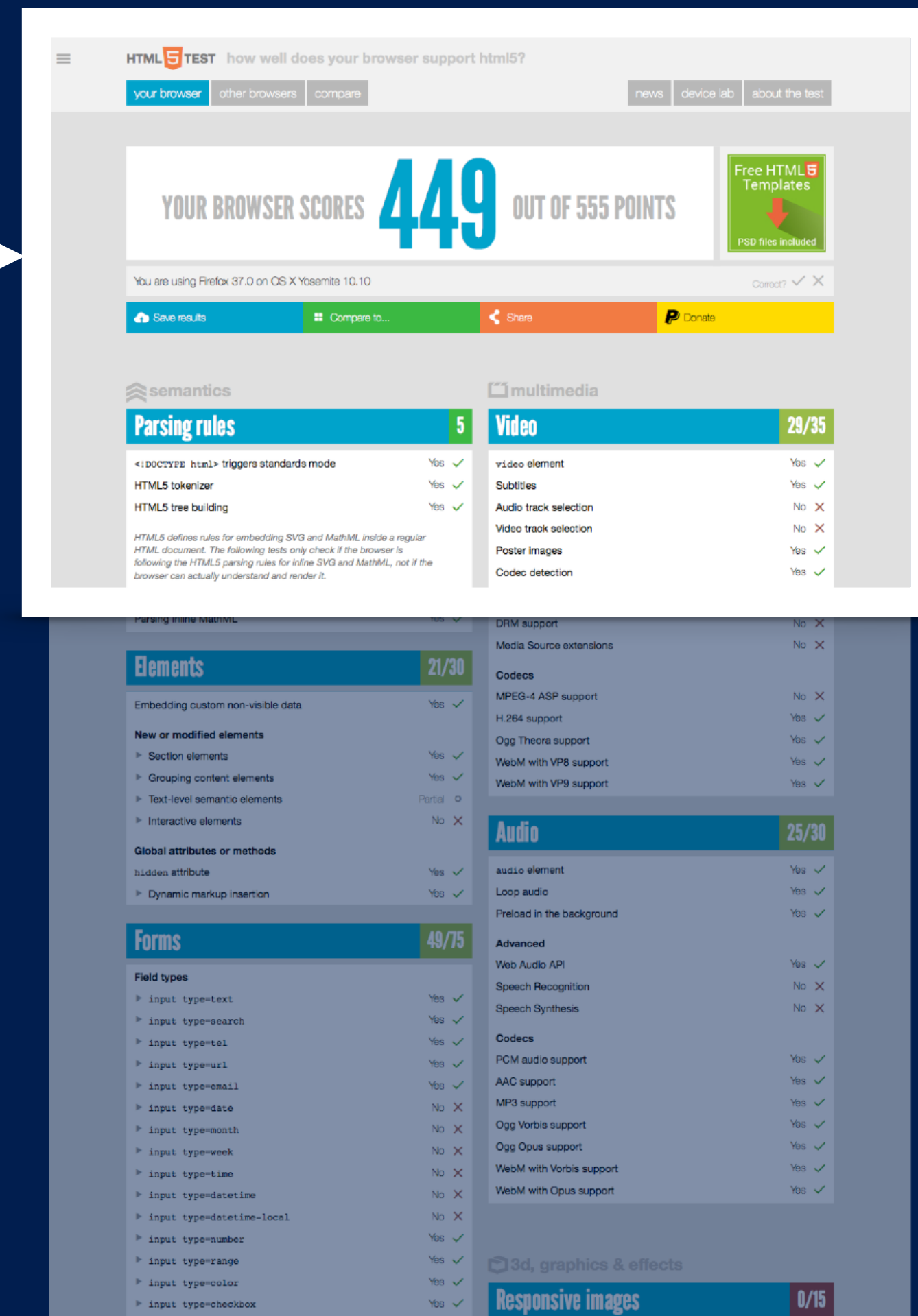
the playstation 3 always shows the browser with overscan correction

the viewport
(i really need some aspirin!)

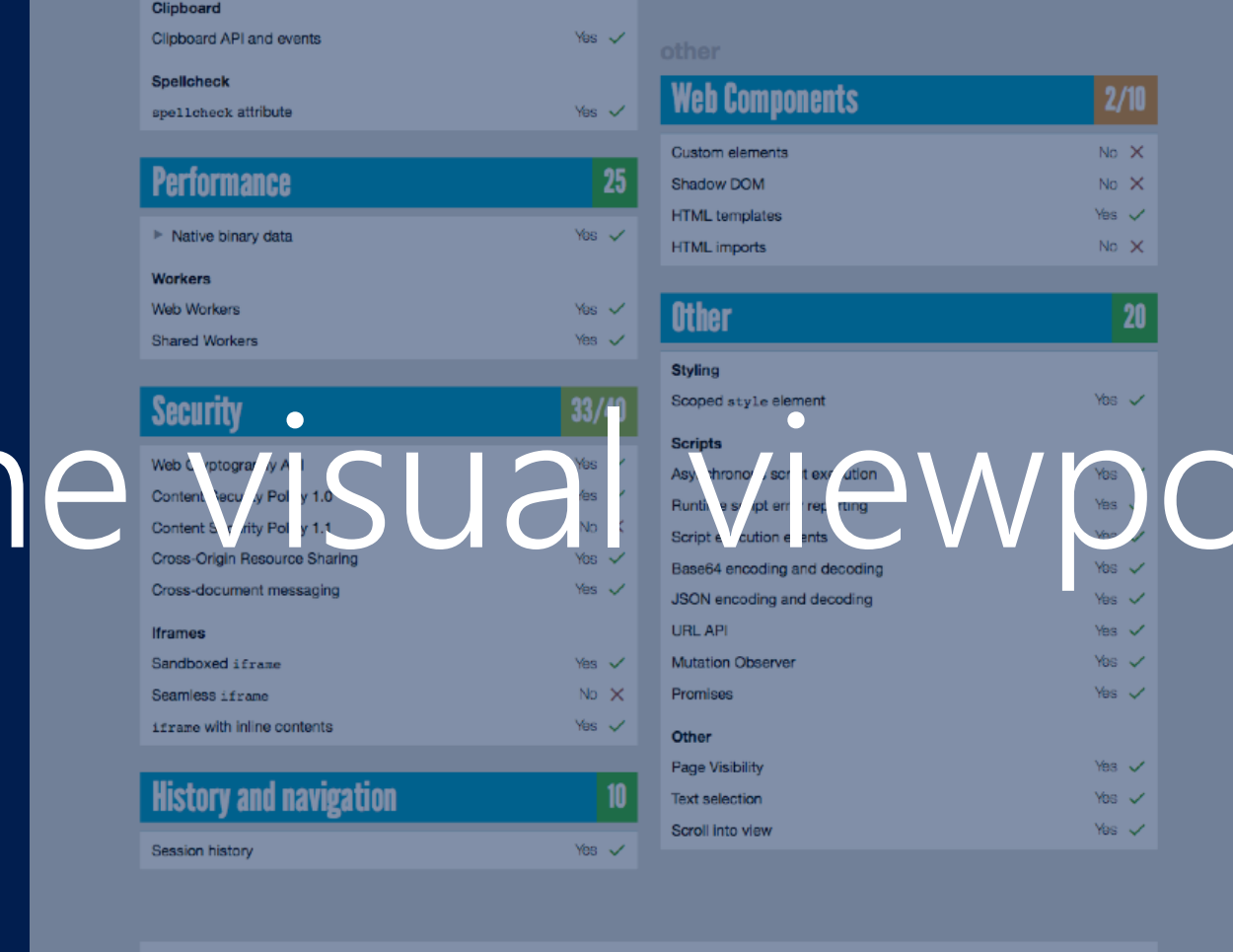
the visual viewport

the visual viewport
determines which
part of the website
will be visible

measured in
device pixels



the visual viewport



the visual viewport
determines which
part of the website
will be visible

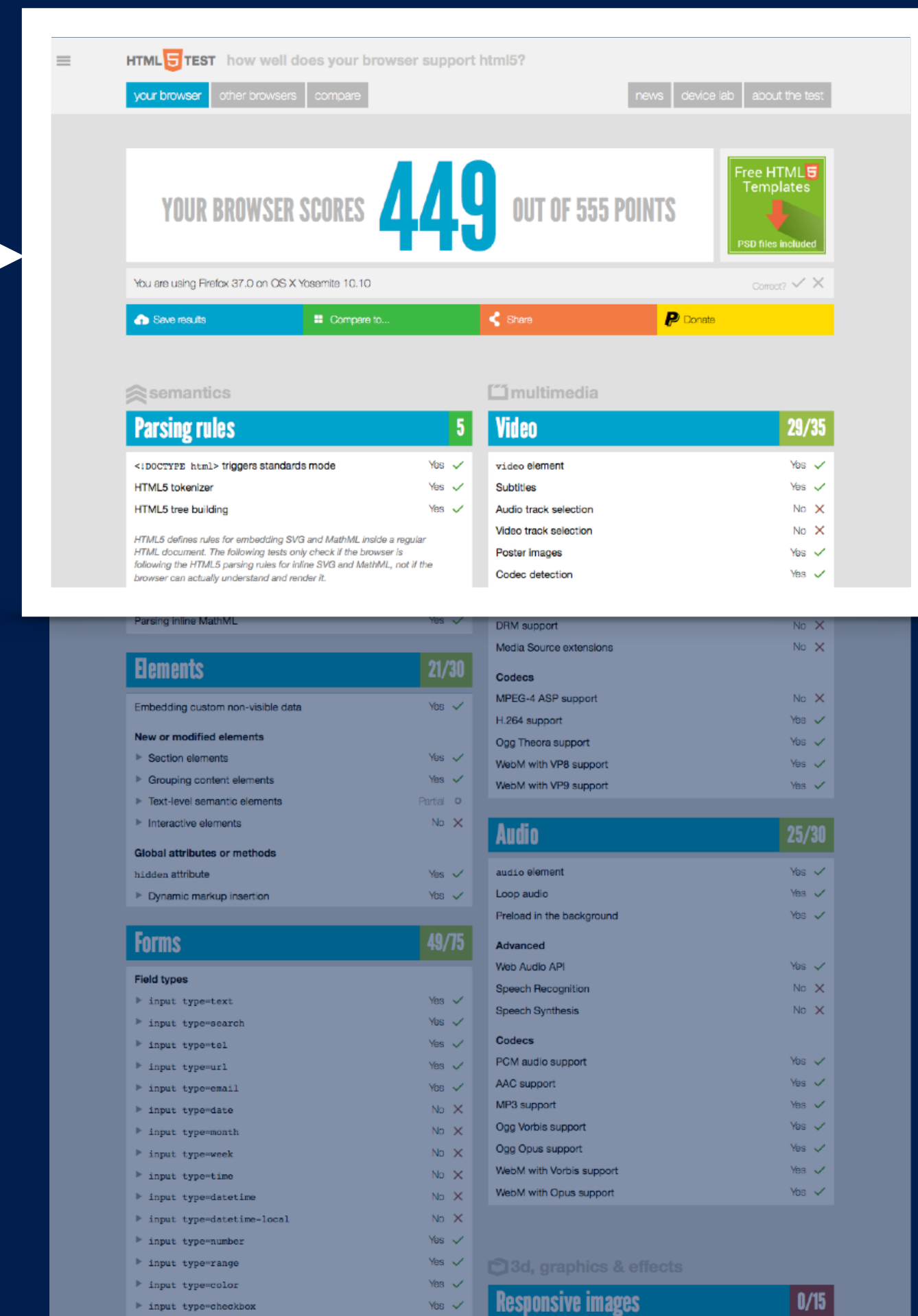
measured in
device pixels



the visual viewport

the visual viewport
determines which
part of the website
will be visible

measured in
device pixels



the layout viewport



HTML5 TEST how well does your browser support html5?

your browser other browsers compare news device lab about the test

YOUR BROWSER SCORES **449** OUT OF 555 POINTS

You are using Firefox 37.0 on OS X Yosemite 10.10

Save results Compare to... Share Donate

semantics

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Parsing inline SVG	Yes	✓
Parsing inline MathML	Yes	✓

Elements 21/30

Embedding custom non-visible data	Yes	✓
New or modified elements		
▶ Section elements	Yes	✓
▶ Grouping content elements	Yes	✓
▶ Text-level semantic elements	Partial	○
▶ Interactive elements	No	✗
Global attributes or methods		
hidden attribute	Yes	✓
▶ Dynamic markup insertion	Yes	✓

Forms 49/75

Field types		
▶ input type=text	Yes	✓
▶ input type=search	Yes	✓
▶ input type=tel	Yes	✓
▶ input type=url	Yes	✓
▶ input type=email	Yes	✓
▶ input type=date	No	✗
▶ input type=month	No	✗
▶ input type=week	No	✗
▶ input type=time	No	✗
▶ input type=datetime	No	✗
▶ input type=datetime-local	No	✗
▶ input type=number	Yes	✓
▶ input type=range	Yes	✓
▶ input type=color	Yes	✓
▶ input type=checkbox	Yes	✓

multimedia

Video 29/35

video element	Yes	✓
Subtitles	Yes	✓
Audio track selection	No	✗
Video track selection	No	✗
Poster images	Yes	✓
Codec detection	Yes	✓
Advanced		
DRM support	No	✗
Media Source extensions	No	✗
Codecs		
MPEG-4 ASP support	No	✗
H.264 support	Yes	✓
Ogg Theora support	Yes	✓
WebM with VP8 support	Yes	✓
WebM with VP9 support	Yes	✓

Audio 25/30

audio element	Yes	✓
Loop audio	Yes	✓
Preload in the background	Yes	✓
Advanced		
Web Audio API	Yes	✓
Speech Recognition	No	✗
Speech Synthesis	No	✗
Codecs		
PCM audio support	Yes	✓
AAC support	Yes	✓
MP3 support	Yes	✓
Ogg Vorbis support	Yes	✓
Ogg Opus support	Yes	✓
WebM with Vorbis support	Yes	✓
WebM with Opus support	Yes	✓

3d, graphics & effects

Responsive images 0/15

the layout viewport determines the width in css pixels on which the site will be rendered

the layout viewport



the layout viewport
determines the width
in css pixels on which
the site will be
rendered

HTML5 TEST how well does your browser support html5?

your browser | other browsers | compare | news | device lab | about the test

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Dynamic markup insertion	Yes	✓

Forms 49/75

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input type=search	Yes	✓
input type=tel	Yes	✓
input type=url	Yes	✓
input type=email	Yes	✓
input type=date	No	✗
input type=month	No	✗
input type=week	No	✗
input type=time	No	✗
input type=datetime	No	✗

multimedia

Video 29/35

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Audio track selection	No	✗
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Ogg Opus support	Yes	✓
WebM with Vorbis support	Yes	✓
WebM with Opus support	Yes	✓

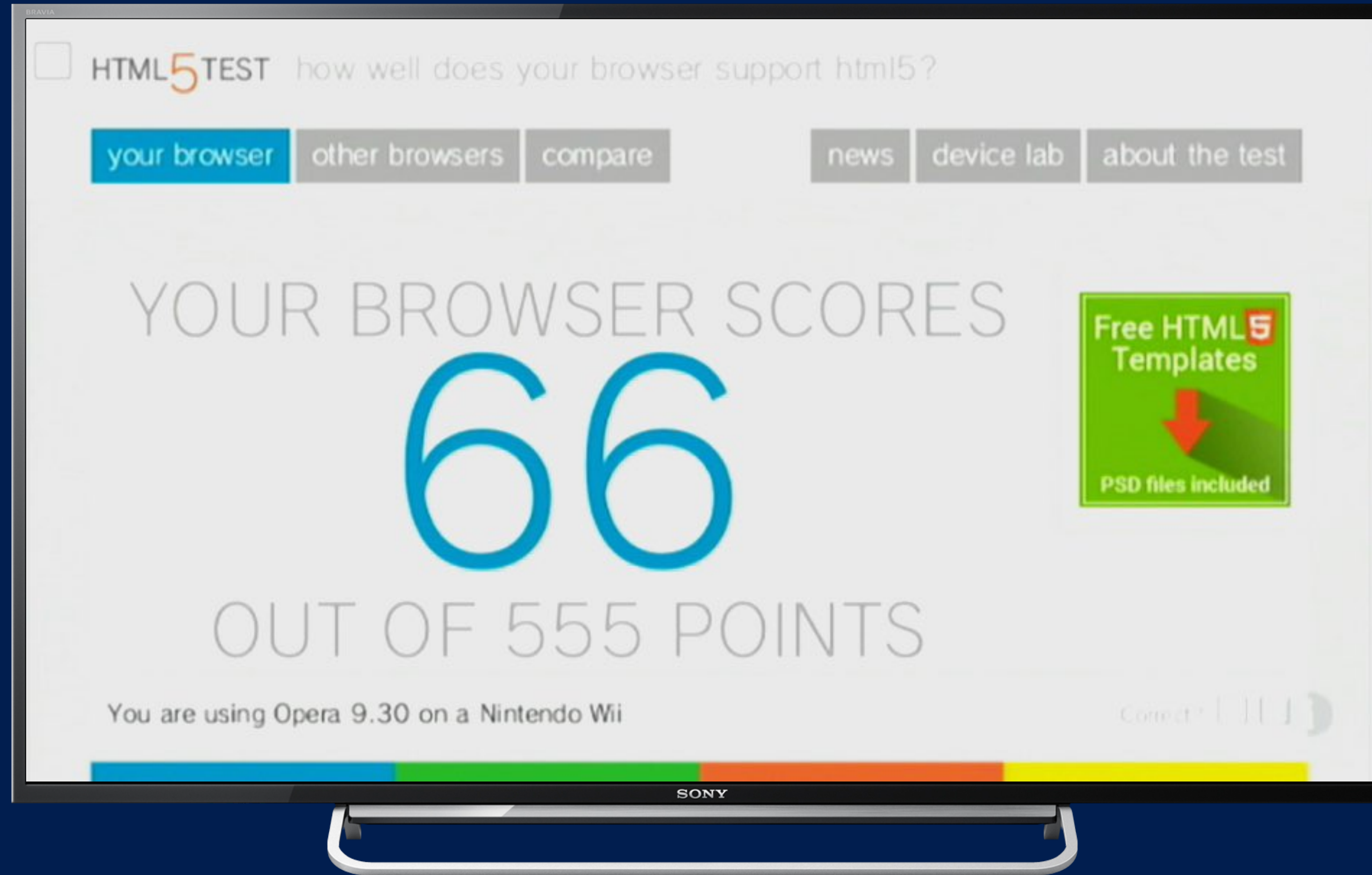
the layout viewport



the layout viewport determines the width in css pixels on which the site will be rendered

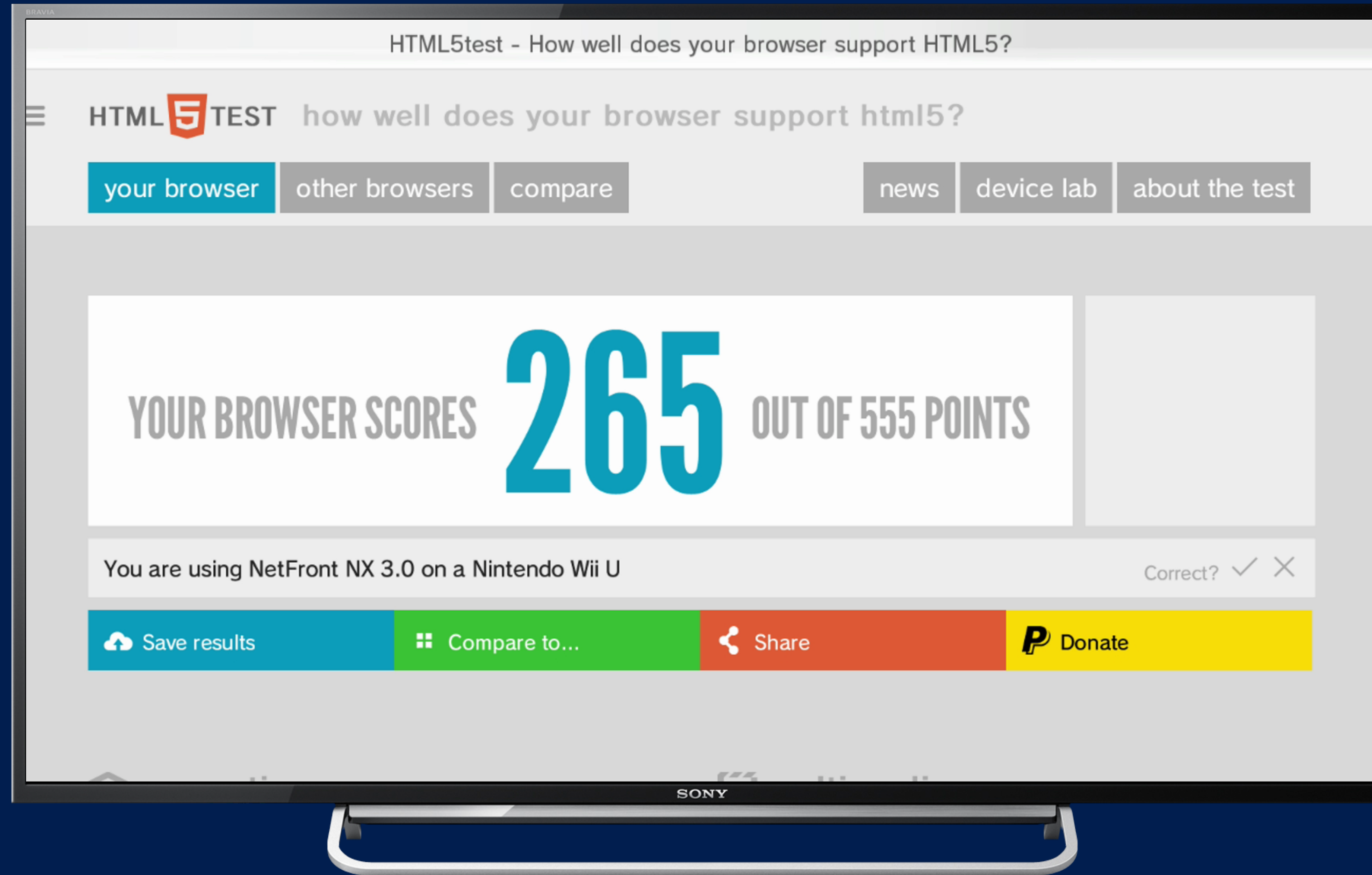
the default layout viewport is different on
every smart tv, console or set-top box
between 800 and 1920 css pixels

800 pixels



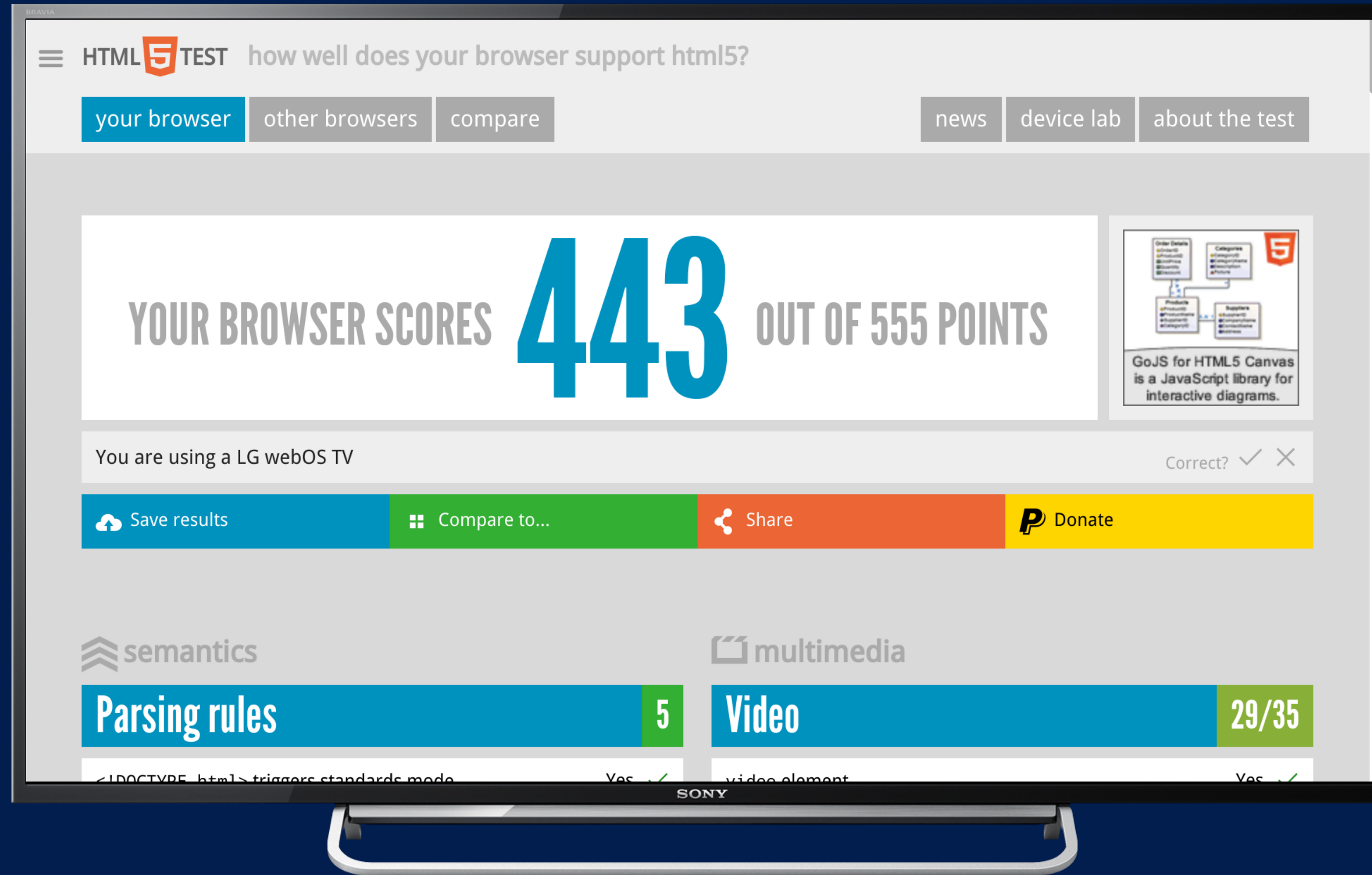
nintendo wii

980 pixels



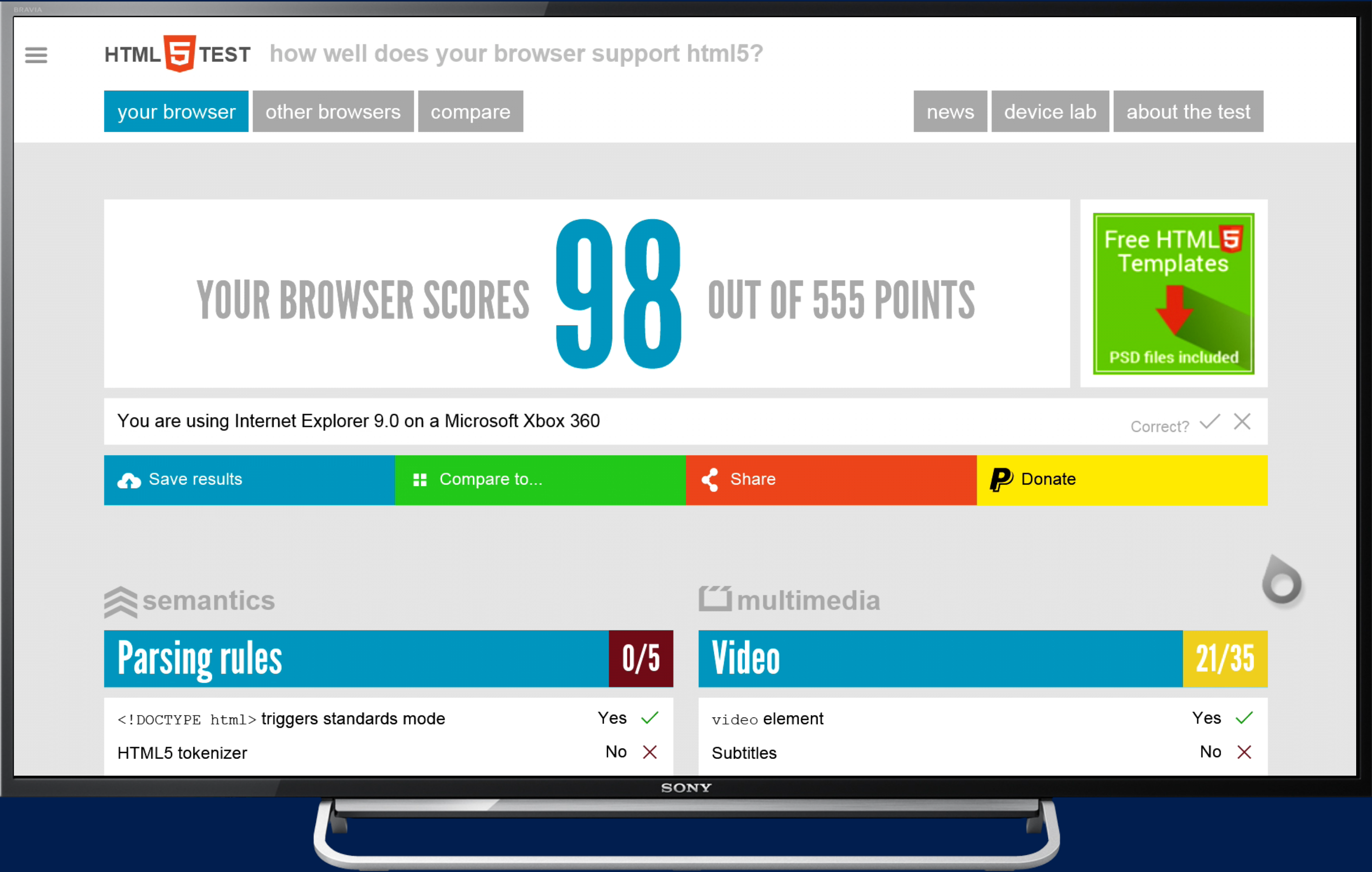
nintendo wii u

960 pixels



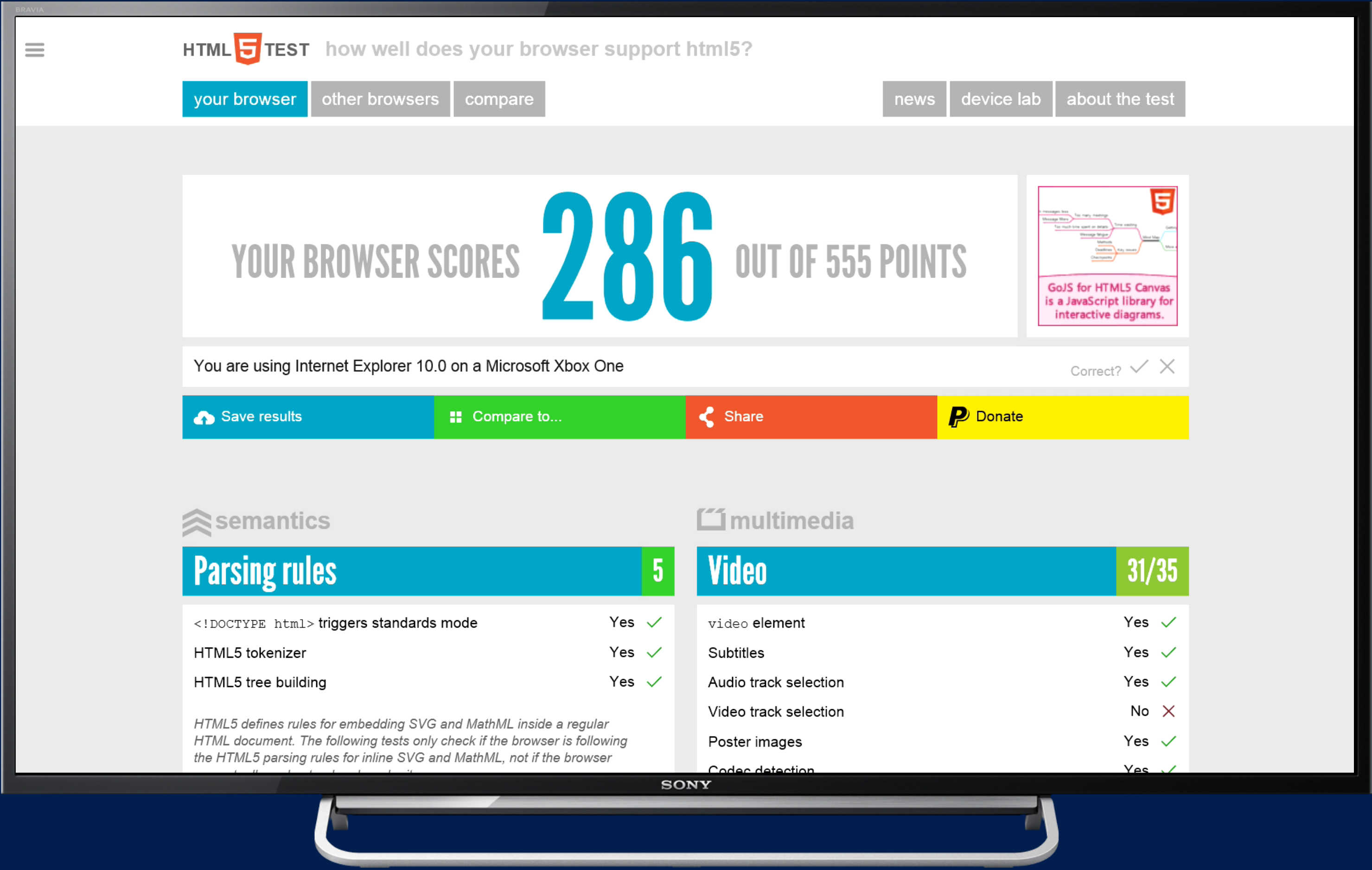
lg webos

1041 of 1050 pixels



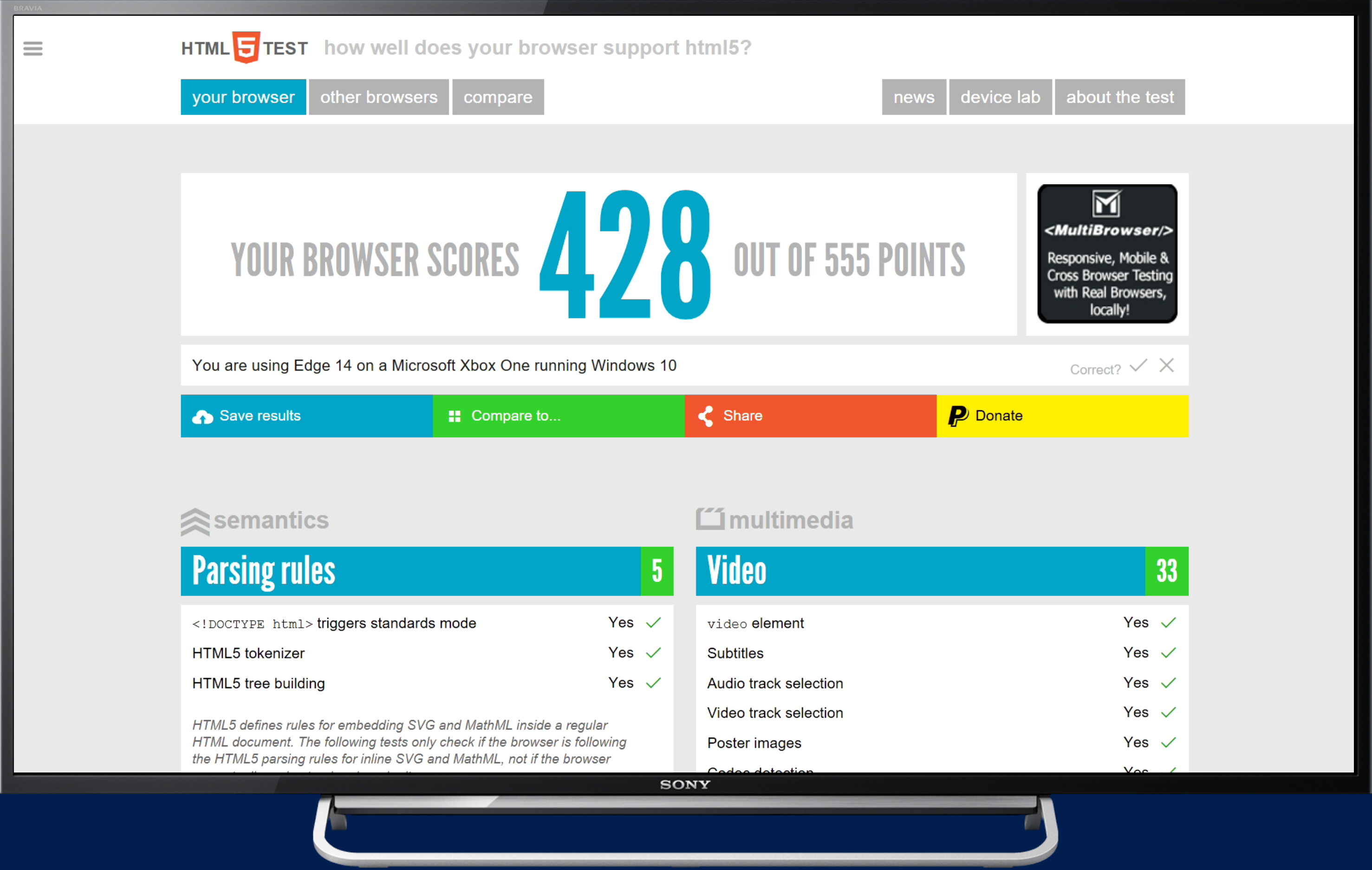
microsoft xbox 360

1200 of 1236 pixels



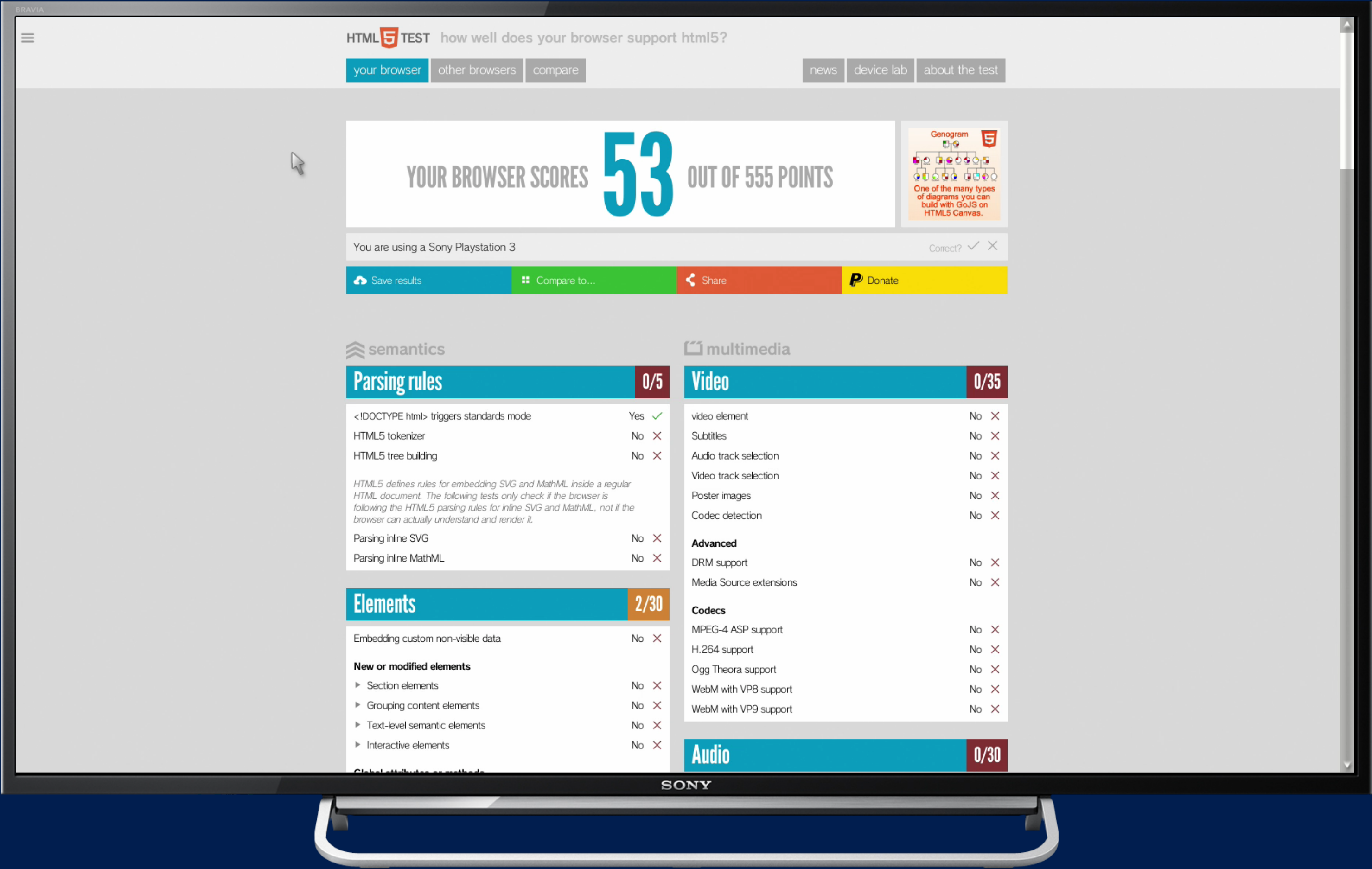
microsoft xbox one

1200 of 1236 pixels



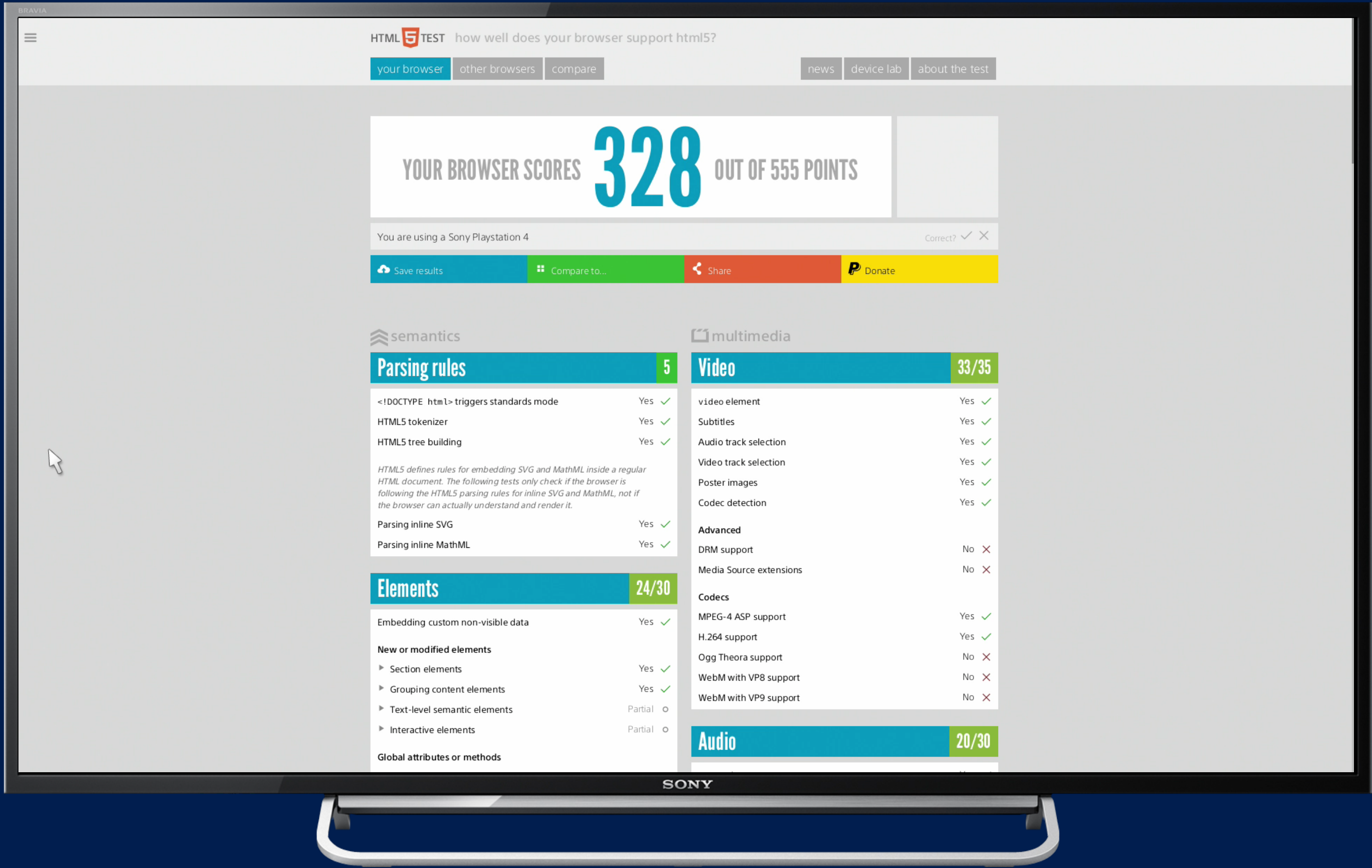
microsoft xbox one (with edge)

1824 pixels

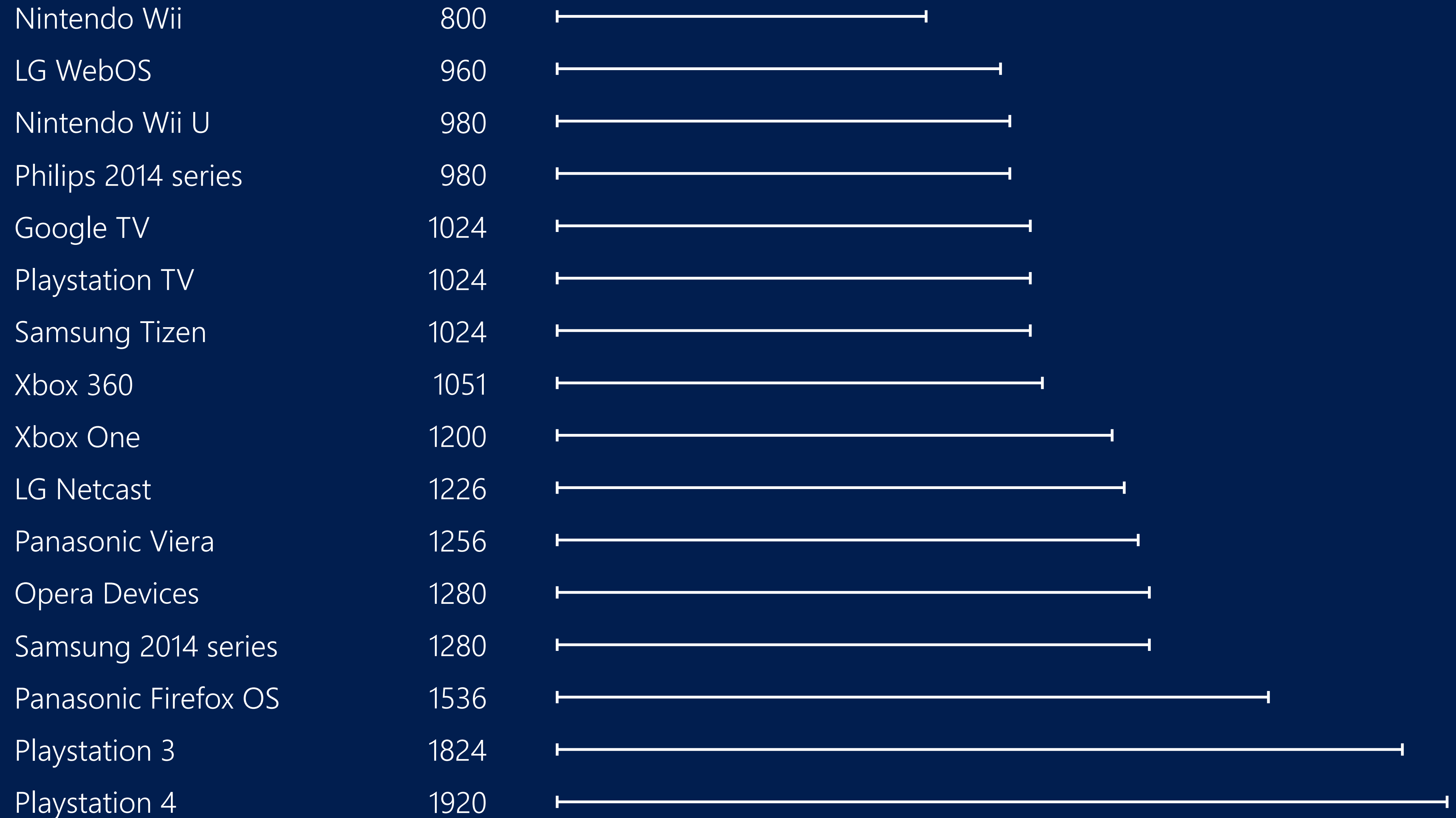


sony playstation 3

1920 pixels



sony playstation 4



device pixels != device pixels

(of course not)

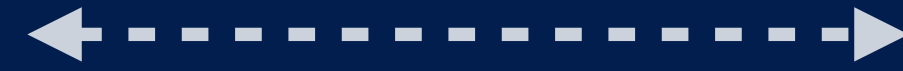
sometimes devices pixels are not
physical devices pixels, but virtual device pixels

the browser renders in a lower resolution
which is upsampled to the resolution of the display

3

distance to the screen

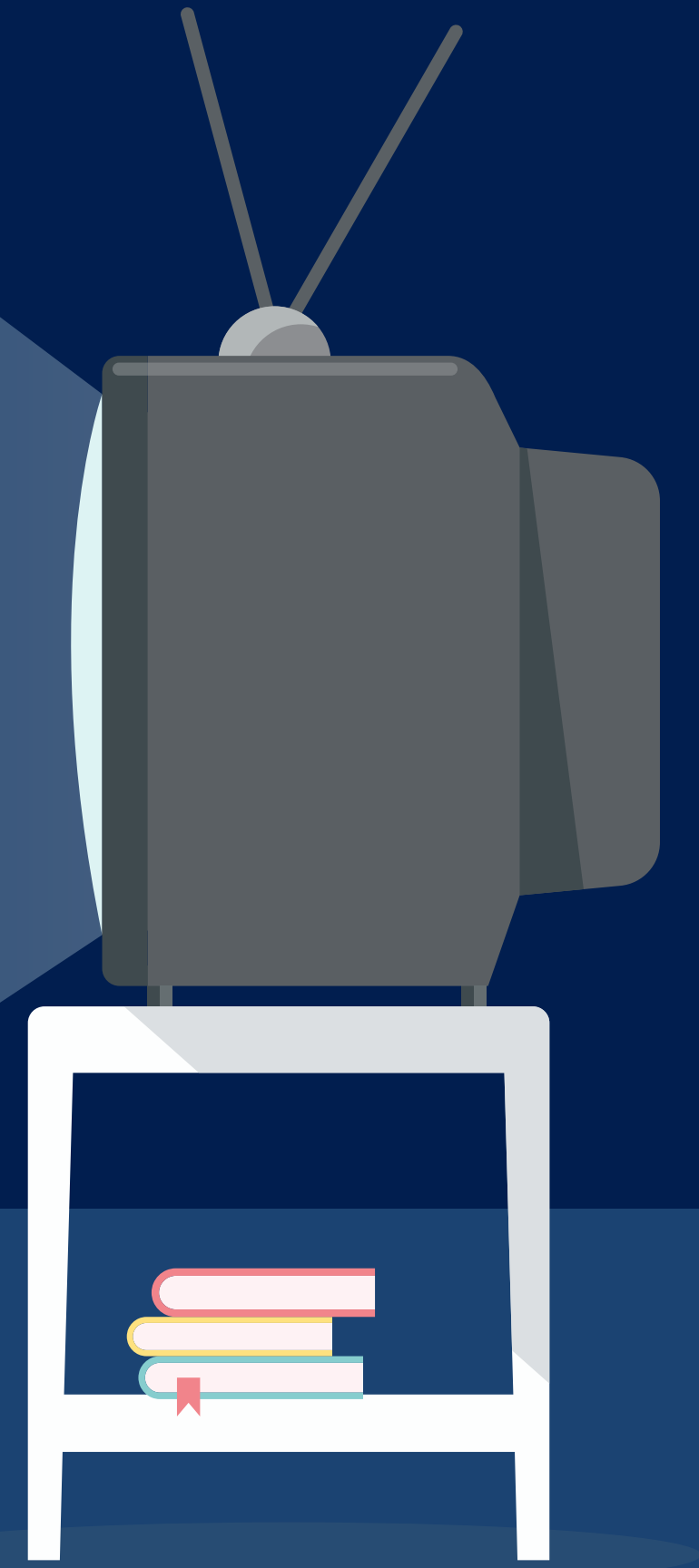
20 inch



20 inch



10 foot



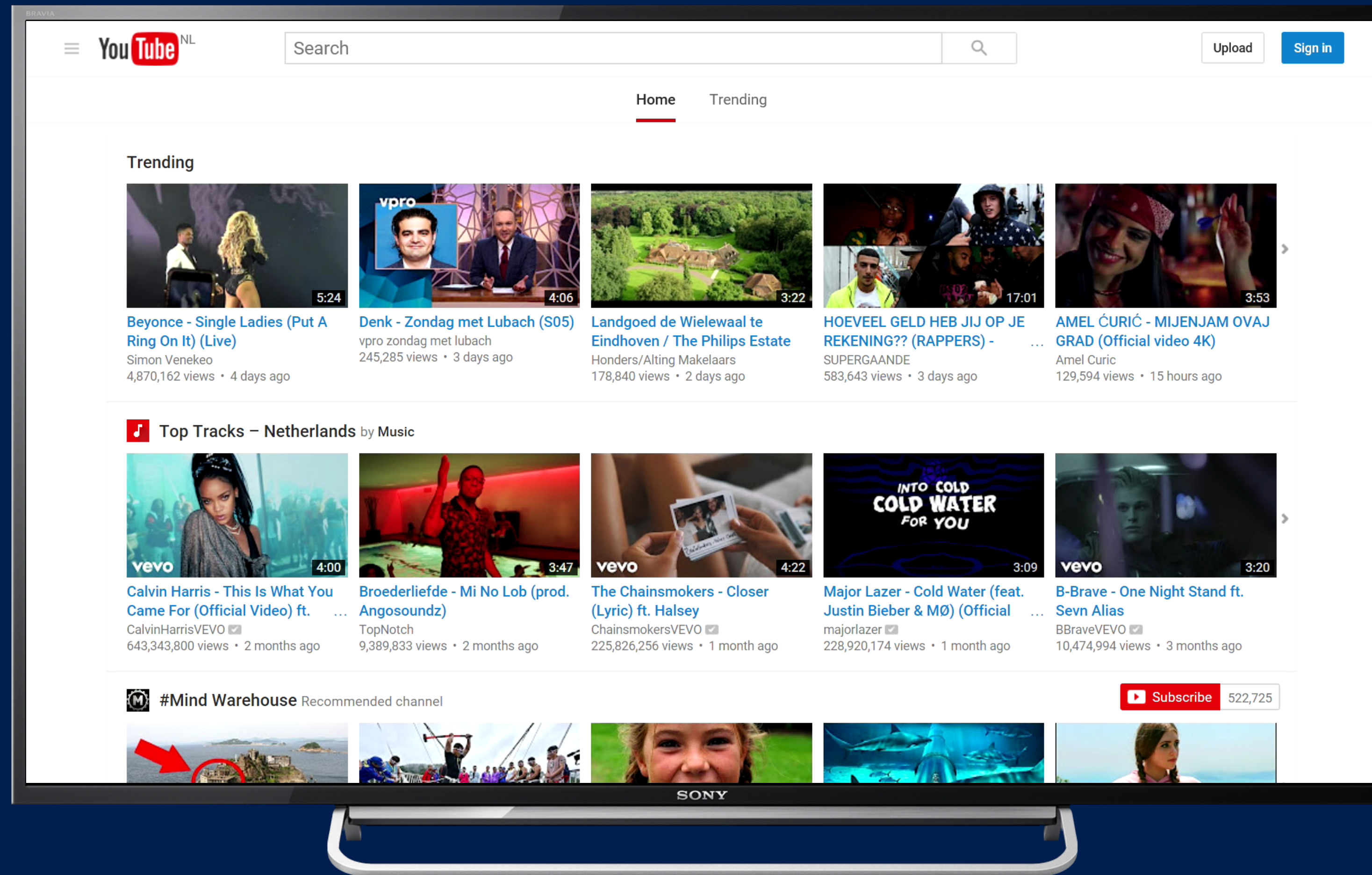
"Make fonts and graphics on the site larger to account for viewing distance. People sit proportionally farther from a TV than from a computer monitor of the same size."

– Internet Explorer for Xbox One Developer Guide

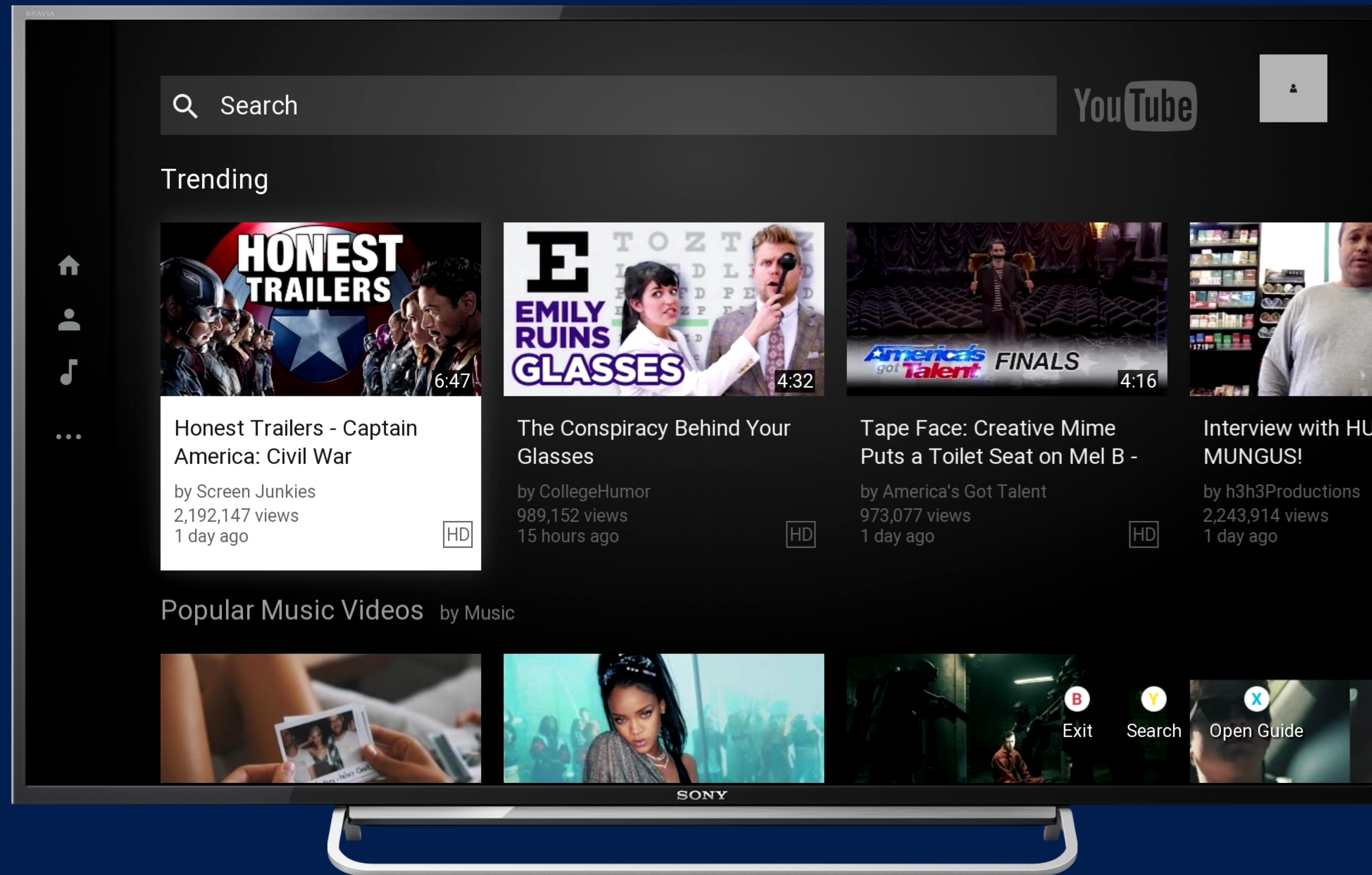
Make your text
and images two to
three times bigger

Make your text
and images two to
three times bigger

Make your text
and images two to
three times bigger



youtube on the big screen



youtube on the big screen

identifying smart tv's

(css for televisions)

1

css media type

```
@media tv {  
  body {  
    font-size: 30px;  
  }  
}
```



1

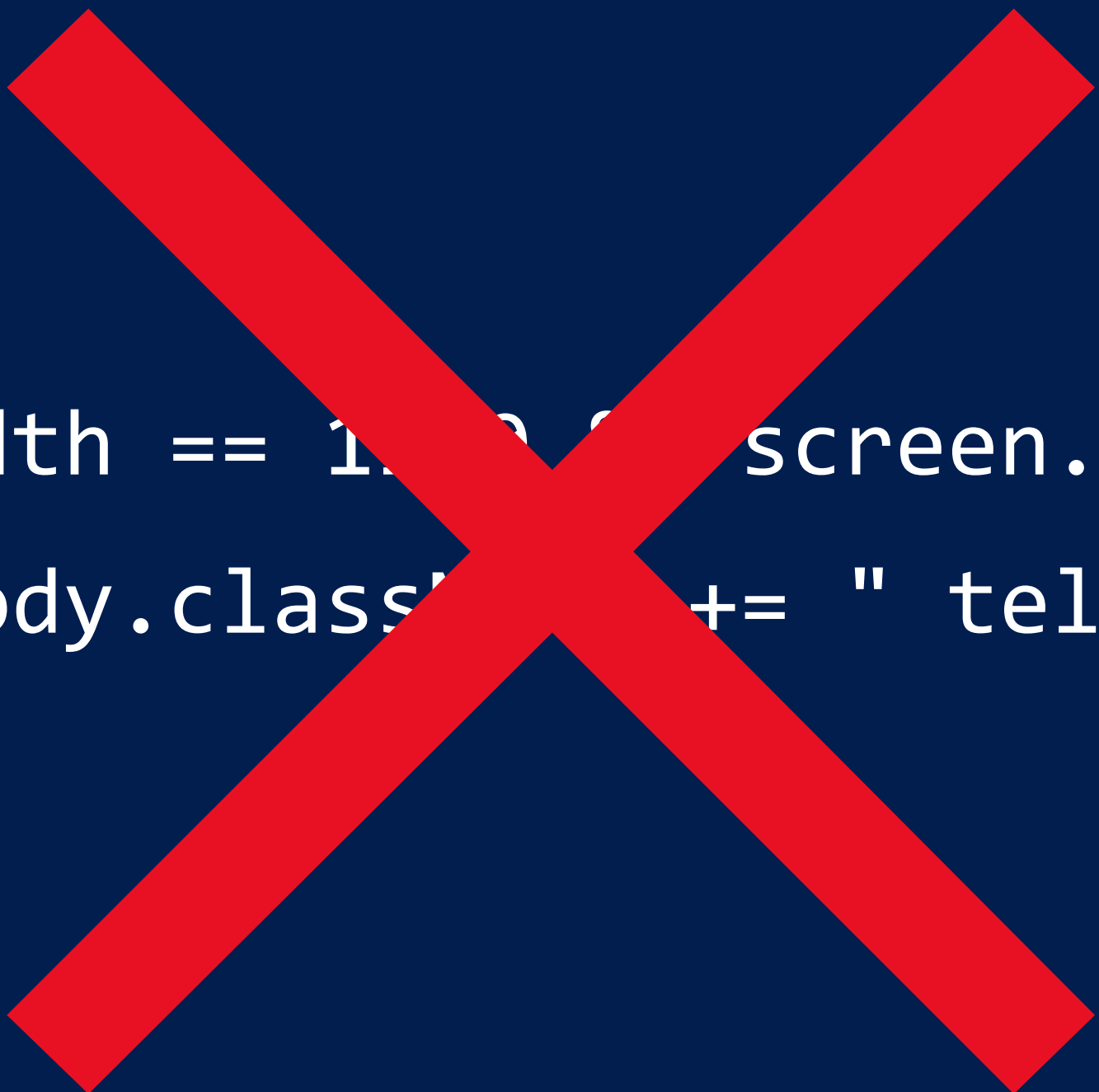
css media types

all television browsers use the
css media type 'screen'

2

screen size

```
if (screen.width == 1024 & screen.height == 1080) {  
    document.body.className += " television";  
}
```



2

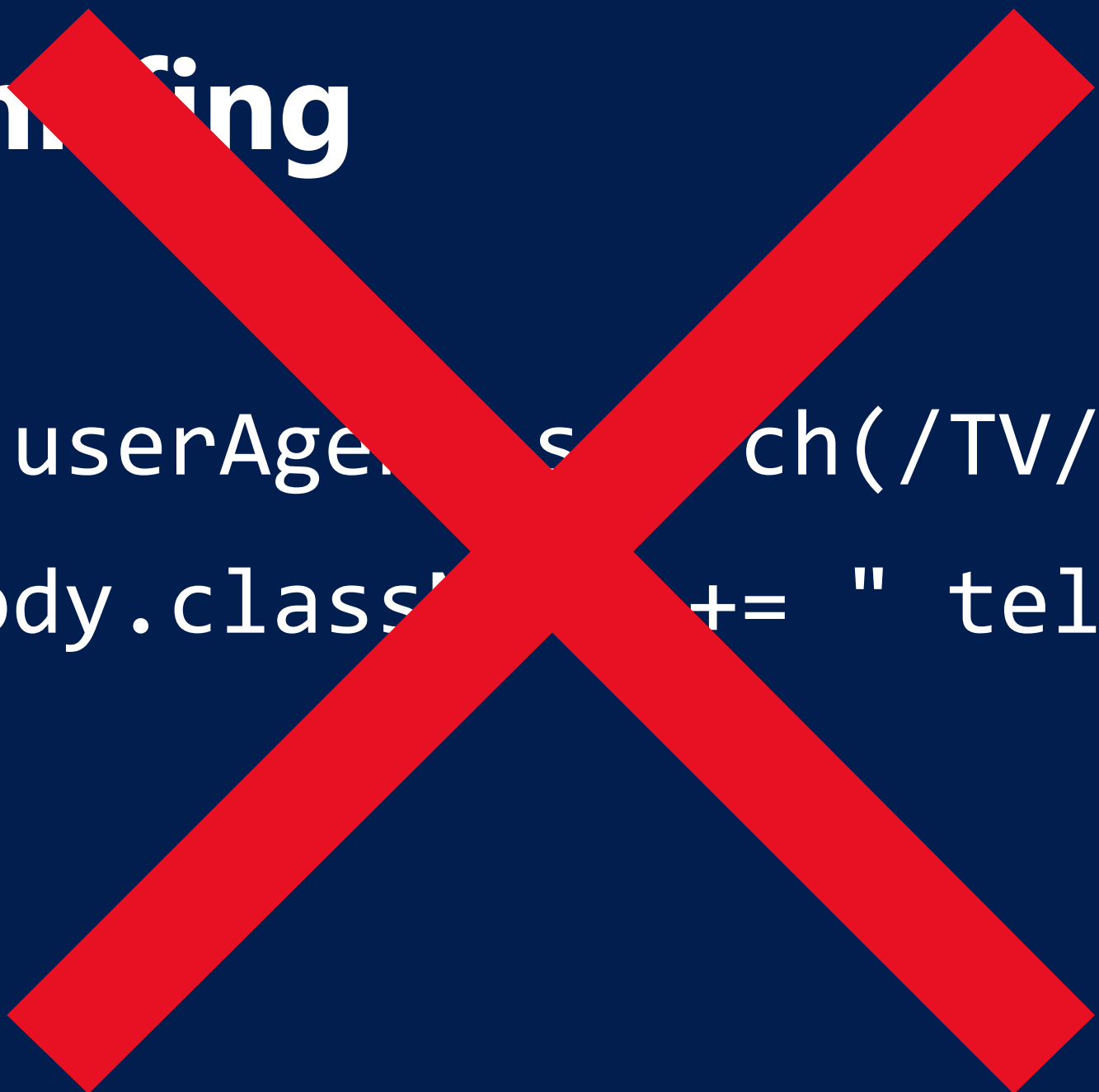
screen size

monitors and phones often use
hd resolutions, television browsers
often use other resolutions

3

useragent sniffing

```
if (navigator.userAgent.search(/TV/i) >= 0) {  
    document.body.classList += " television";  
}
```



3

useragent sniffing

not all smart tv's are recognisable

`Mozilla/5.0 (X11; Linux; ko-KR)`

`AppleWebKit/534.26+ (KHTML, like Gecko)`

`Version/5.0 Safari/534.26+`

4

couch mode

the only reliable way to optimise a website for television is to make two different websites...

or give the user the ability to switch on couch mode

4

***be careful with
feature detection***

"Basically every feature that talks to the operating system or hardware, is suspect."

– Me, just now

```
if (!!navigator.geolocation) {  
    navigator.geolocation.getCurrentPosition(  
        success, failure  
    );  
}  
else {  
    // alternative  
}
```



```
if (!!navigator.geolocation) {  
    navigator.geolocation.getCurrentPosition(  
        success, failure  
    );  
}
```

1

failure is called with a "permission denied" error code

2

no callback at all to success or failure

```
if (!!navigator.geolocation) {  
    navigator.geolocation.getCurrentPosition(  
        success, failure  
    );  
}
```

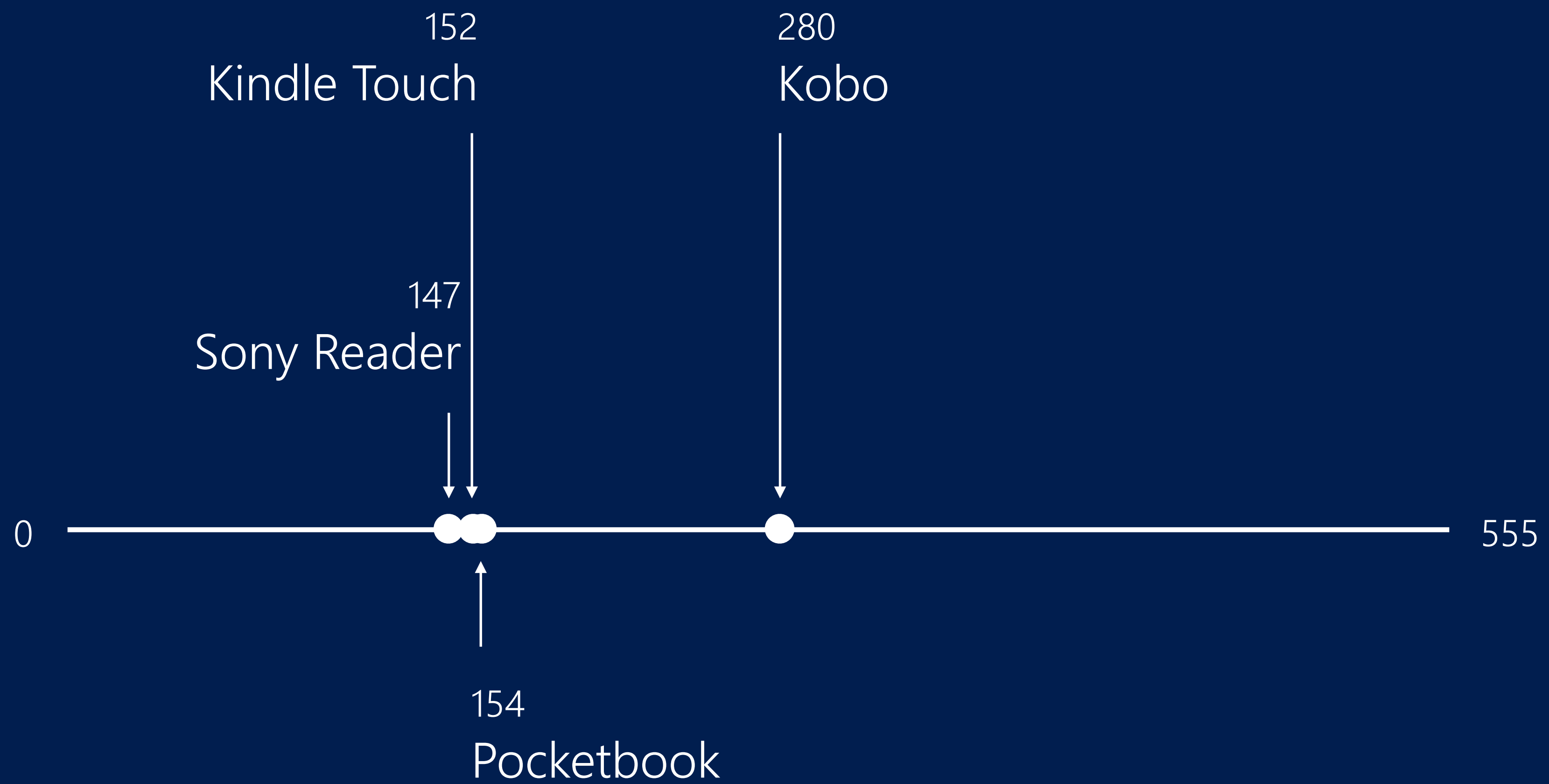
3

success is called with longitude = 0 and latitude = 0

4

success is called with the coordinates of
Mountain View, USA

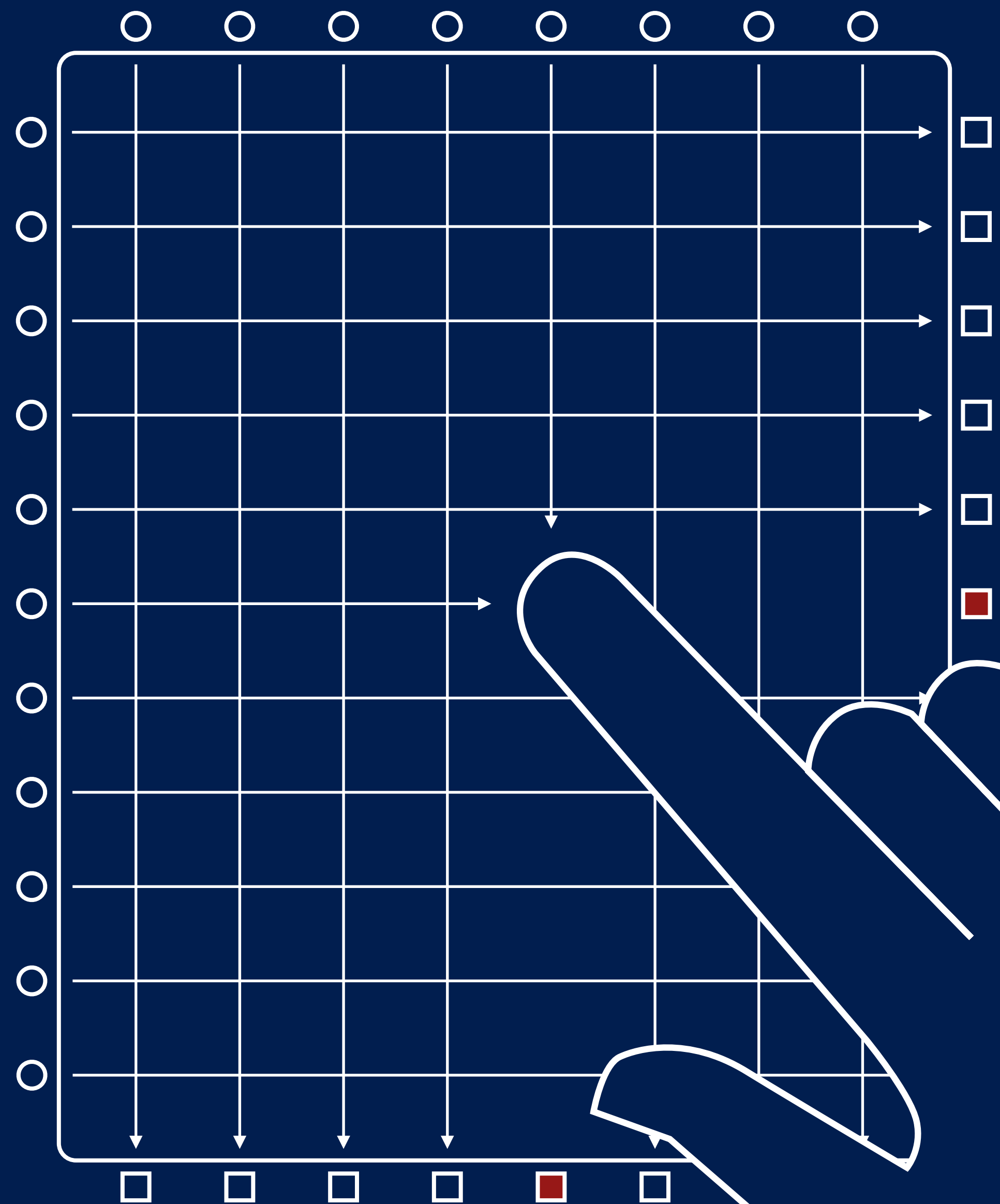
e-readers



e-reader results on html5test.com

infrared touch screen

led's



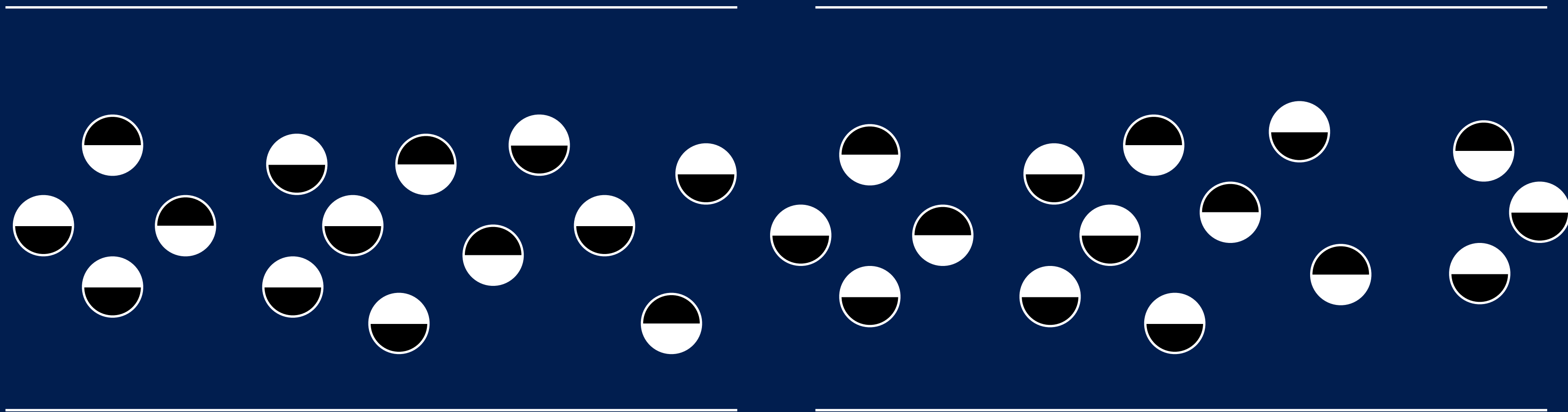
sensors

	mouse events		touch events
	down/up	move	
amazon kindle touch	yes		
pocketbook basic touch	yes		
kobo glow	yes	yes	
sony reader	yes	yes	1 finger

e-ink screens

(slow, slower, slowest)

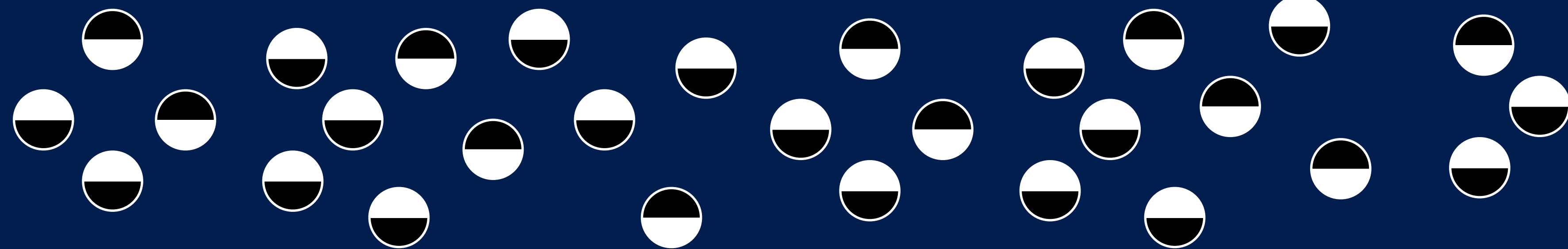
microscopic electrostatic charged balls



microscopic electrostatic charged balls

+

-



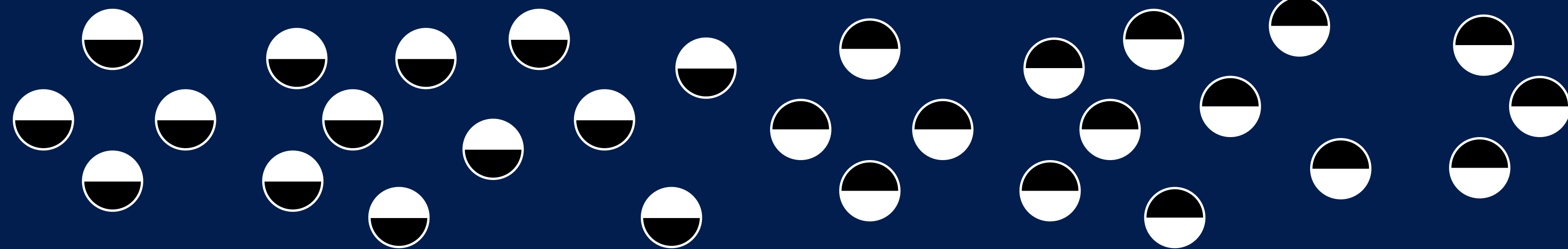
-

+

microscopic electrostatic charged balls

+

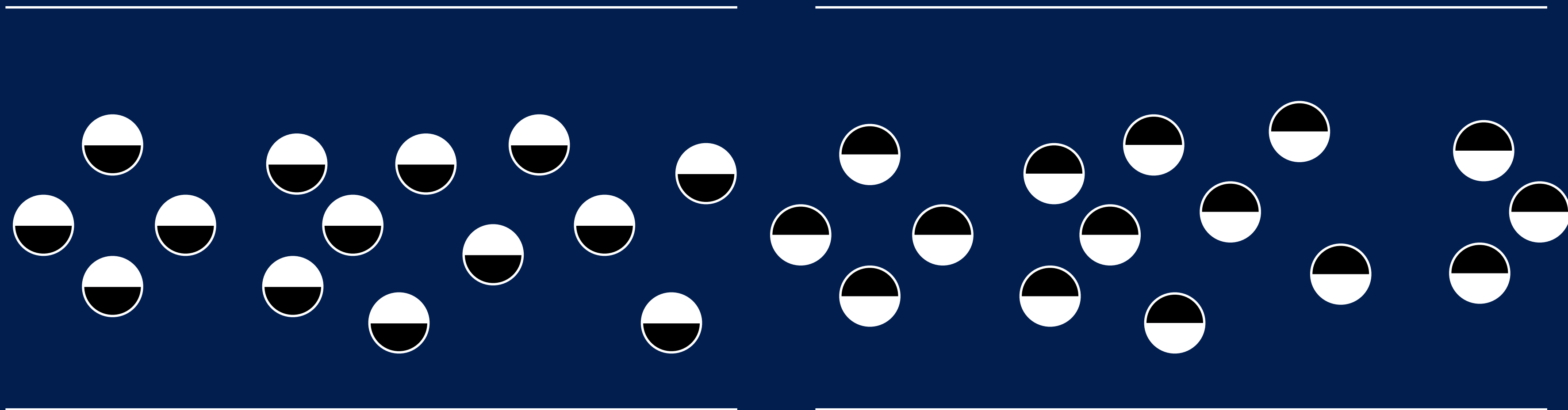
-



-

+

microscopic electrostatic charged balls





HTML5test - How well do...

http://html5test.com/

HTML5 TEST

how well does your browser support html5?

your browser

other browsers

compare

news

device lab

about the test

YOUR BROWSER SCORES
280

OUT OF 555 POINTS

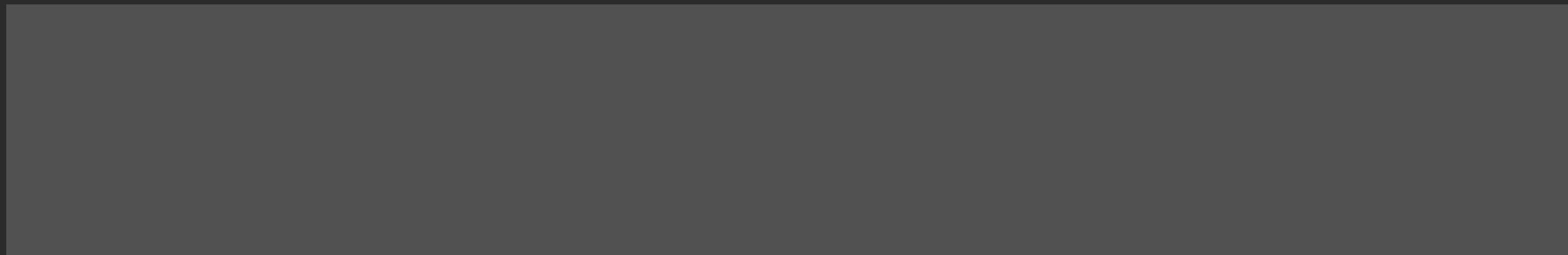
kobo

maybe css animations and transitions
weren't such a great idea after all

two completely different colors can look
exactly the same in black and white



two completely different colors can look
exactly the same in black and white



identifying e-readers

(css for e-ink screens)

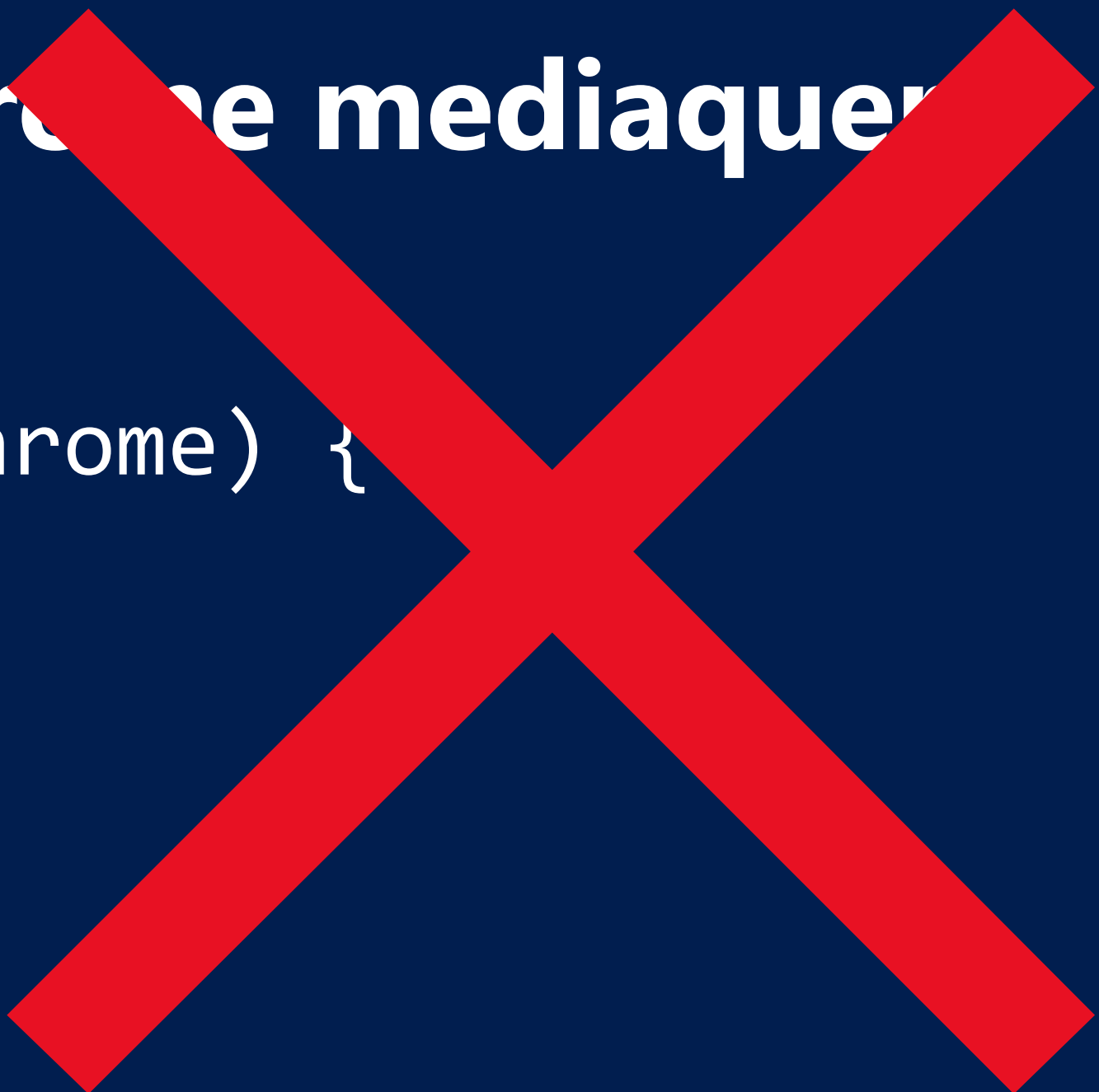
1

css monochrome mediaquery

```
@media (monochrome) {
```

```
...
```

```
}
```



1

css monochrome mediaquery

all tested e-readers act like
they have a color screen

2

useragent sniffing

there is no universal marker in the useragent string, but we can recognise individual manufacturers and models

vr headsets

oculus rift



htc vive



microsoft hololens



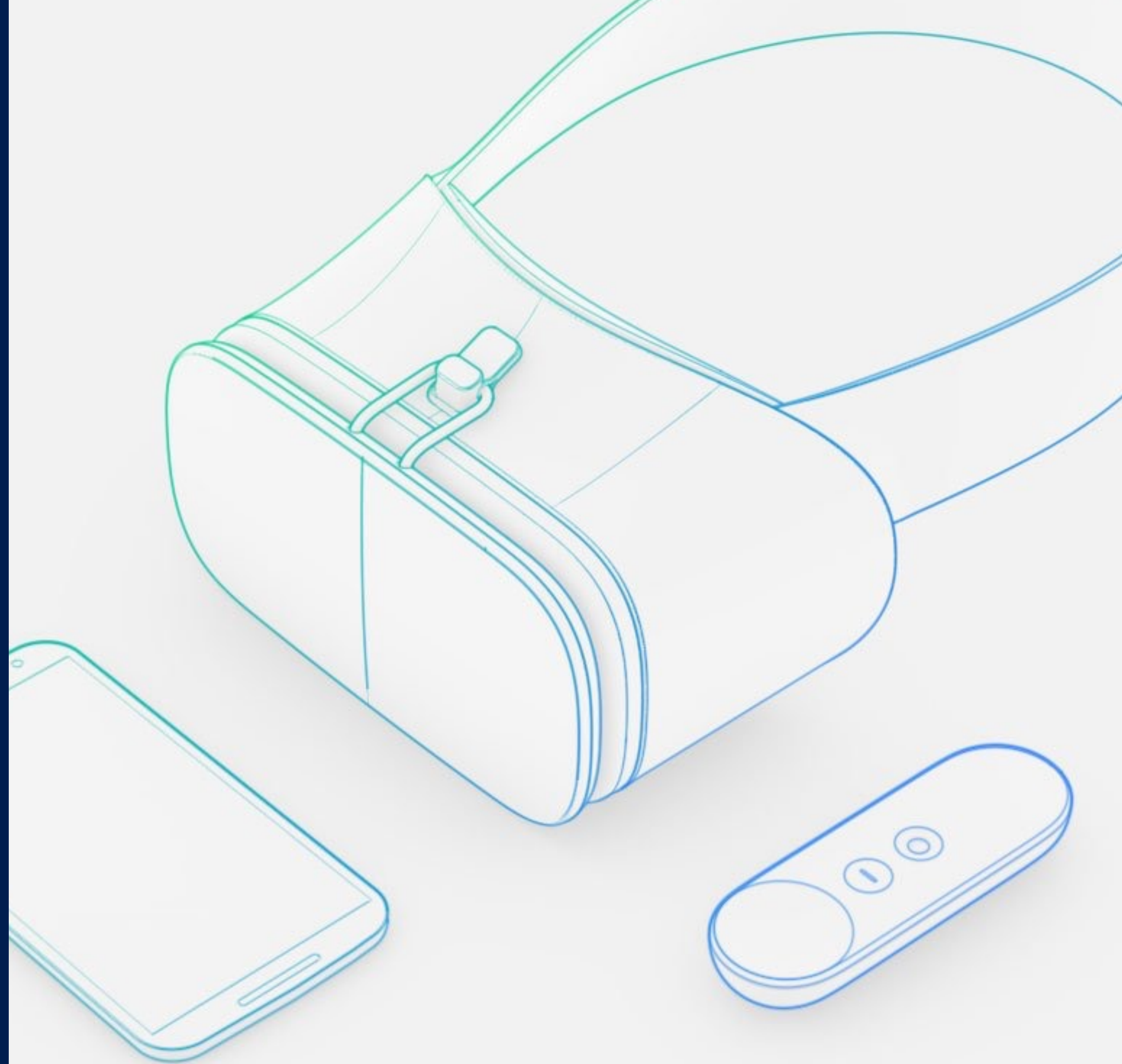
very expensive

but...

google cardboard

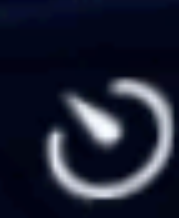


google daydream



samsung gear vr





Most visited



Video history



webvr

(webgl on steroids)

head tracking and camera geometry
project the 3d scene to two different eyes



Chrome

experimental build



Firefox

nightly builds

or



Samsung Internet

behind a flag



Chrome

experimental build



Firefox

nightly builds

or



Samsung Internet

behind a flag

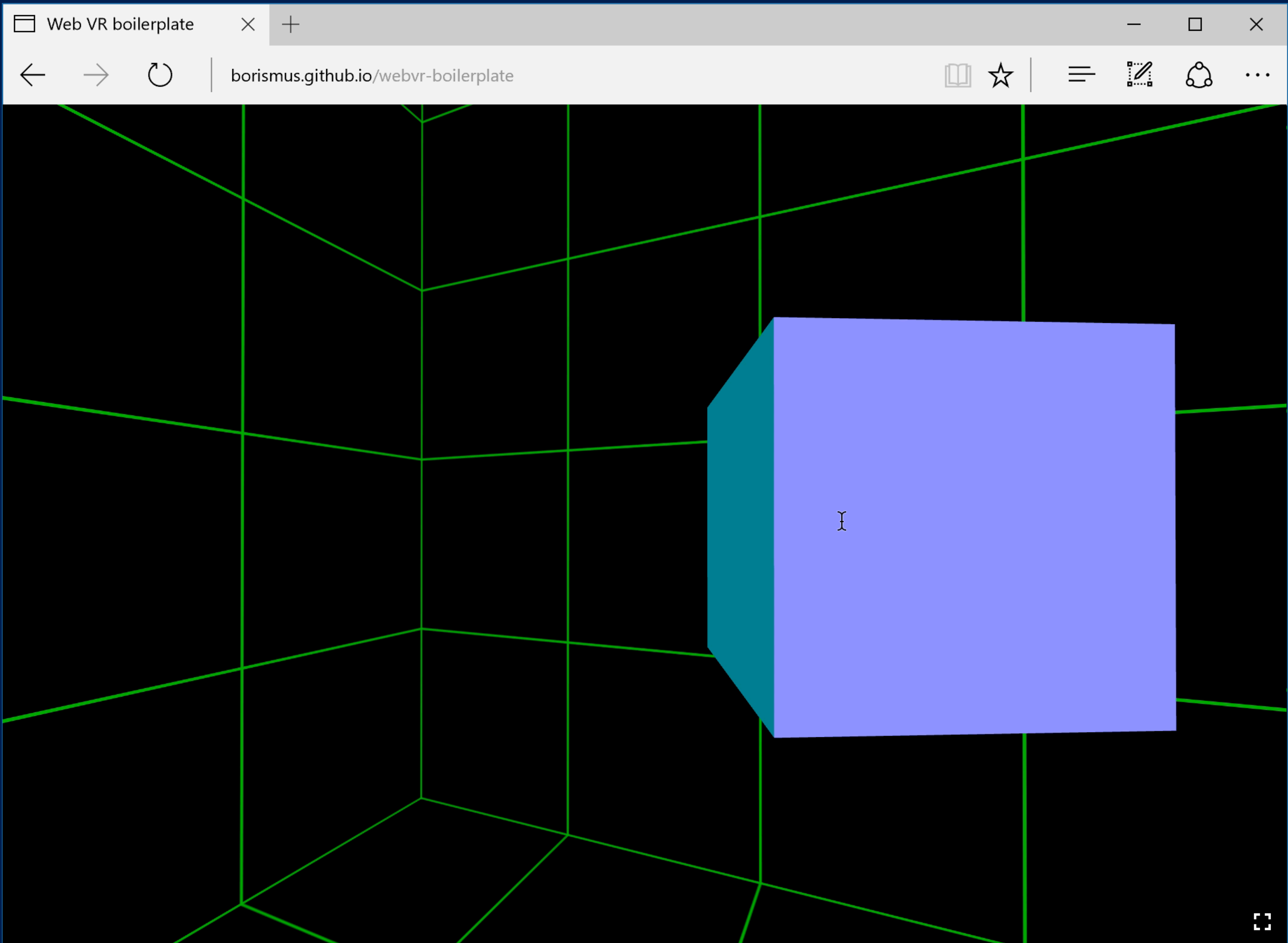
or



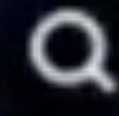
Edge

soon

<https://iswebvrready.org>



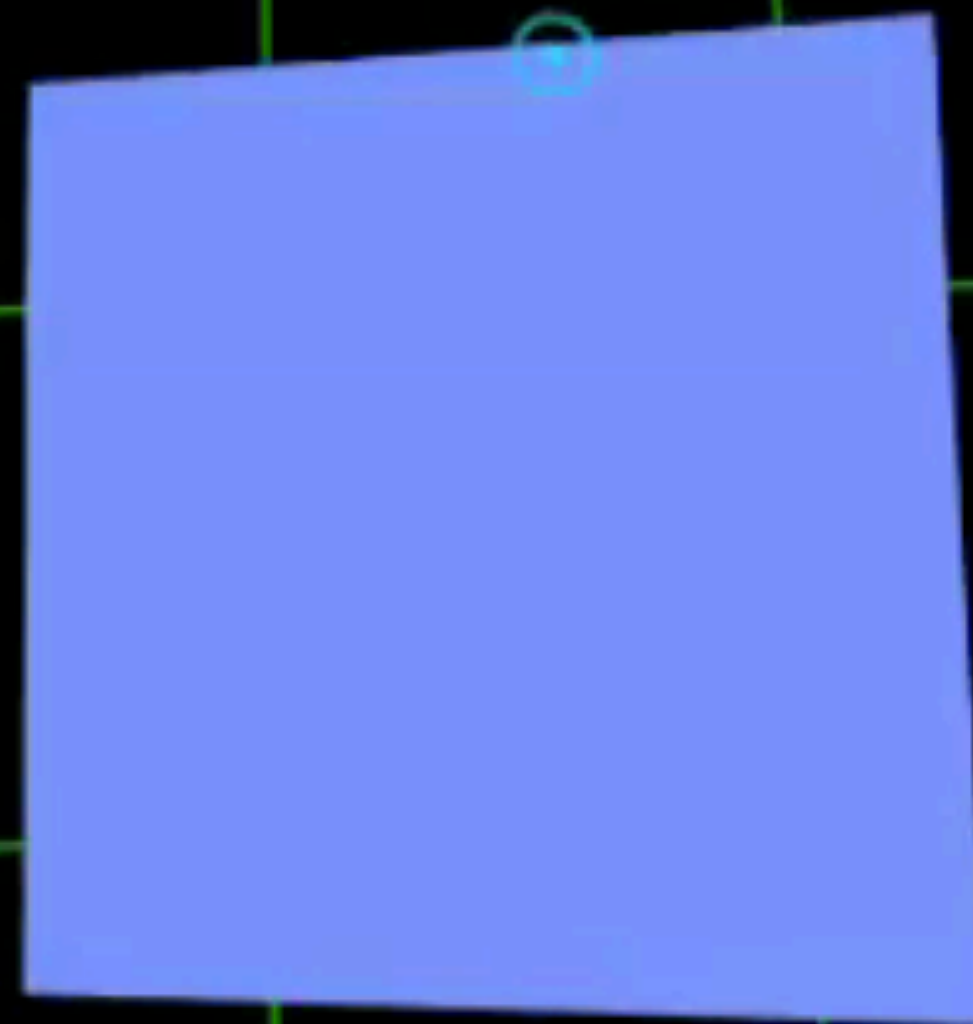
Samsung Internet



NEW TAB

MORE

<http://borismus.github.io/webvr-boilerplate/>



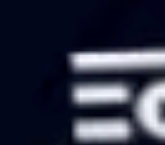
Bookmarks



Quick actions



Most visited



Video

weird browsers!

*"We cannot predict future behavior
from a current experience that sucks"*

– Jason Grigsby

but wait...

weird browsers!

~~weird~~ *browsers!*

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

browsers

thank you

niels leenheer
@html5test