

HTML5 Mobile Web:

USED BY MILLIONS

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belly

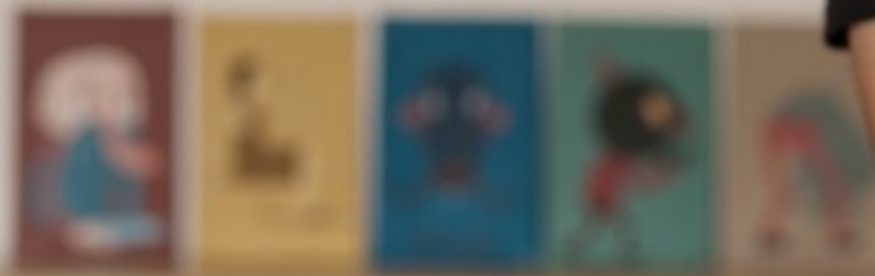


CHICAGO





THE
TOWER
TOYS



belly

Check in with Belly.
Get free stuff more often.

FUN, EASY AND FREE REWARDS PROGRAM

belly Belly

Earn Points Every Visit. Get Amazing Rewards. Repeat.
How? Simply scan a card to visit.

belly

Get Rewards
You Actually
Want.

rotofugi

Tap to Belly

See all of our rewards

100% Satisfaction For The Day! One-day Delivery & One-Day 95% Extra! Check it by Email





Belly is the free loyalty program.

Check-in with email >

1

Grab a card or the app

2

Tap and scan your card

3

Rack up rewards!



Butcher & The Burger
1021 W. Armitage Ave.

Points & Rewards

10

Get A Complimentary Bacon, Avocado, Truffle Mayo...

15

Free Fries (\$2.50 Value)

30

Free Hat (\$10 Value)

45

Free Choice Of Spice Blend In Bottle (\$12 Value)

55

Free Meatloaf (\$15 Value)

TAP TO BELLY >



BELLY ENGINEERING

SQUAD



EST 2011

HANDMADE IN CHICAGO





facebook

Linked 

“The biggest mistake
we made as a company
was **HTML5**” ~Zuck

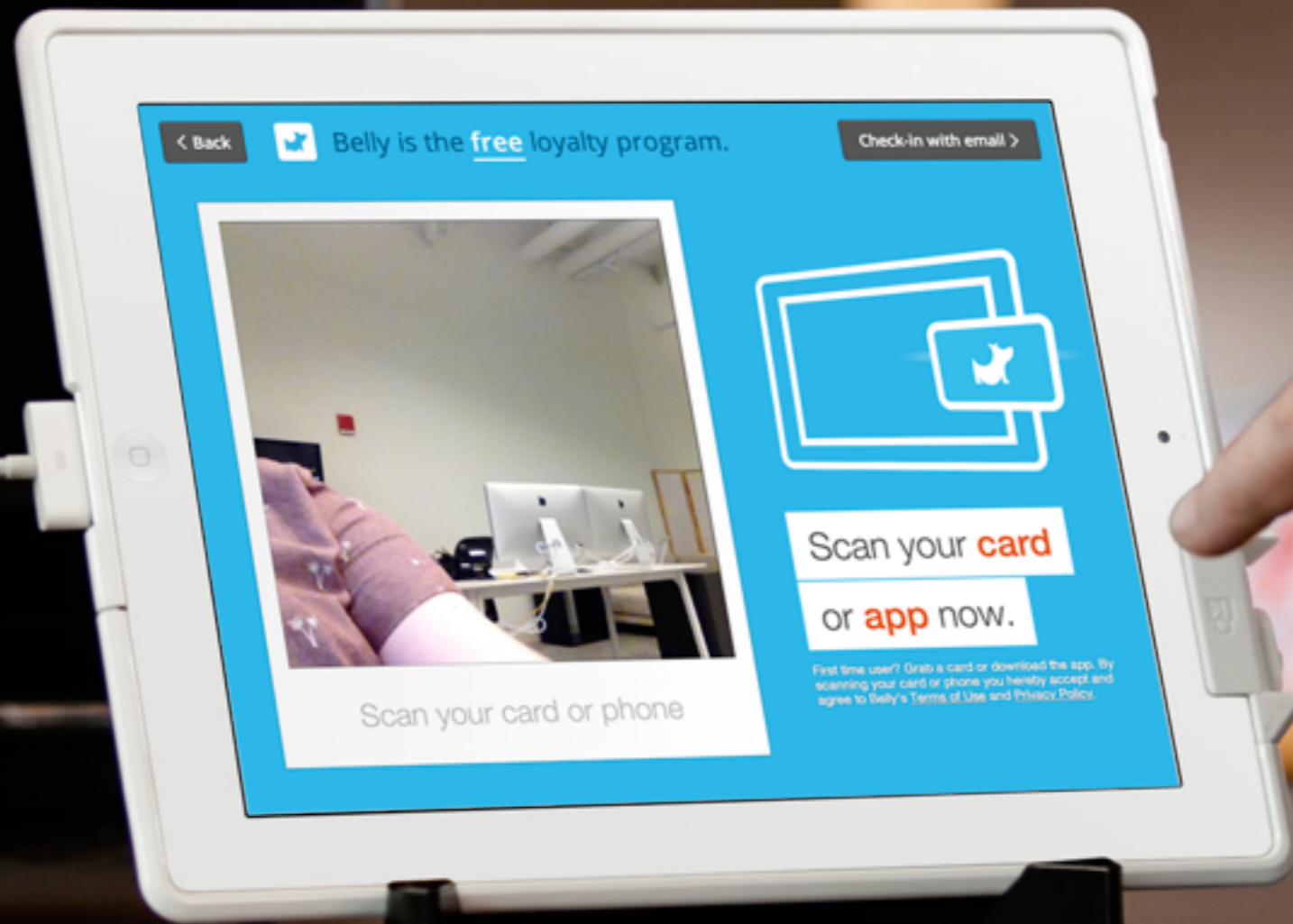
MARK ZUCKERBERG
FACEBOOK FOUNDER





THE PROBLEM

- Deploying took time and money
- Innovation Slowed
- Bugs could kill all activity



< Back



Belly is the free loyalty program.

Check-in with email >



Scan your card or phone

Scan your **card**
or **app** now.

First time user? Grab a card or download the app. By scanning your card or phone you hereby accept and agree to Belly's Terms of Use and Privacy Policy.



The Code

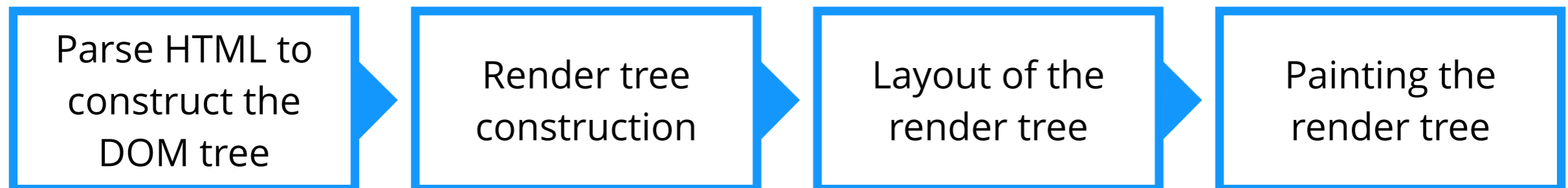
- Backbone.js
- Dogbone.js (Custom)
- Phonegap (For Plugin Architecture)
- Bootloader

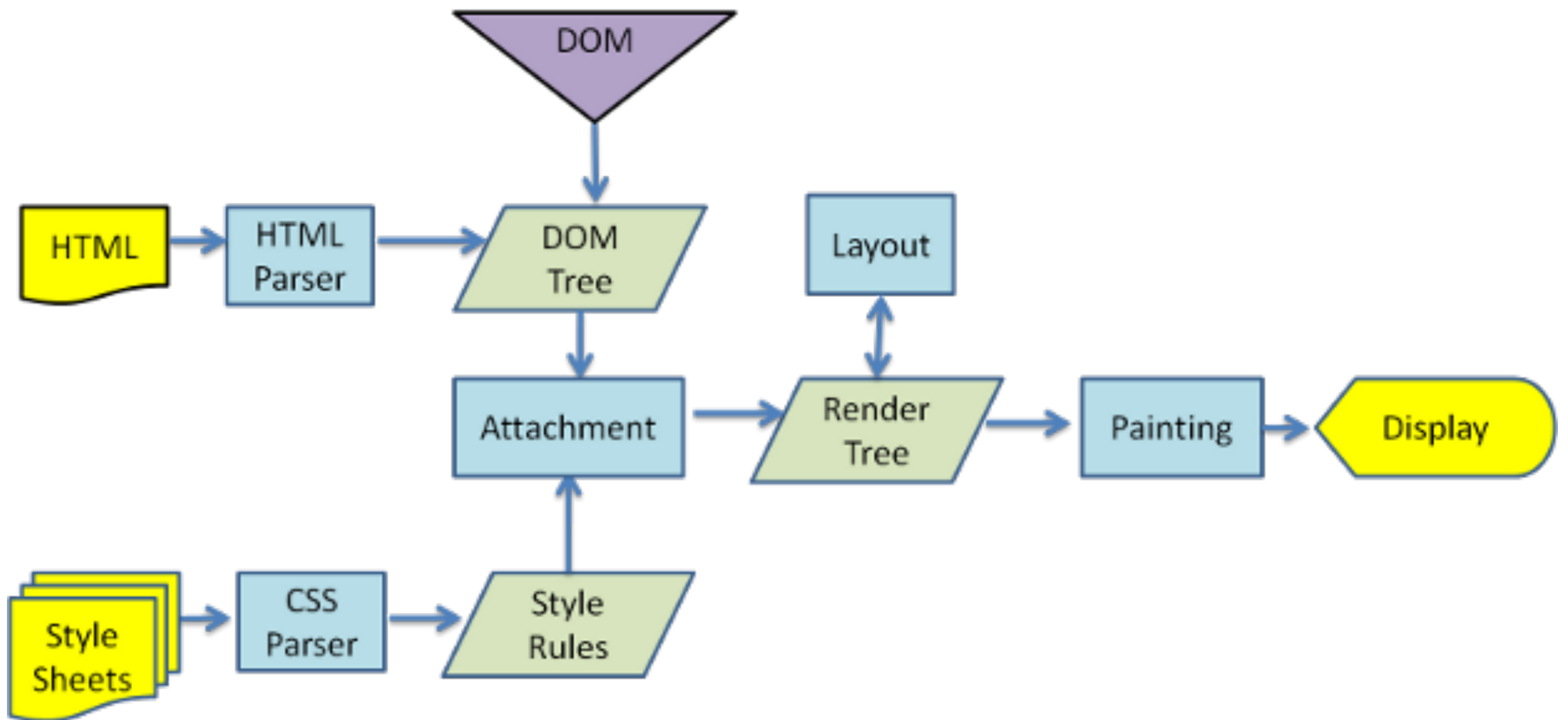
Start Your Engine

Browser Rendering Engine



Rendering Process



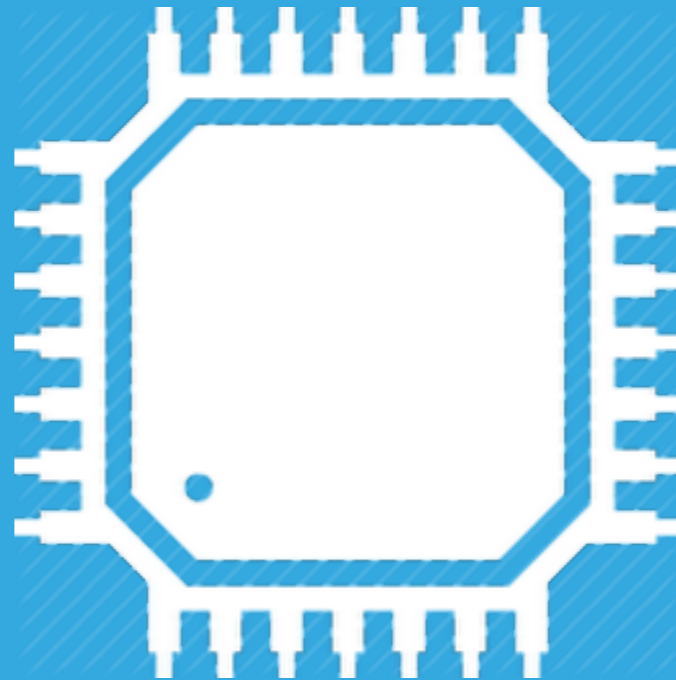


http://www.html5rocks.com/en/tutorials/internals/howbrowserswork/#Rendering_engines

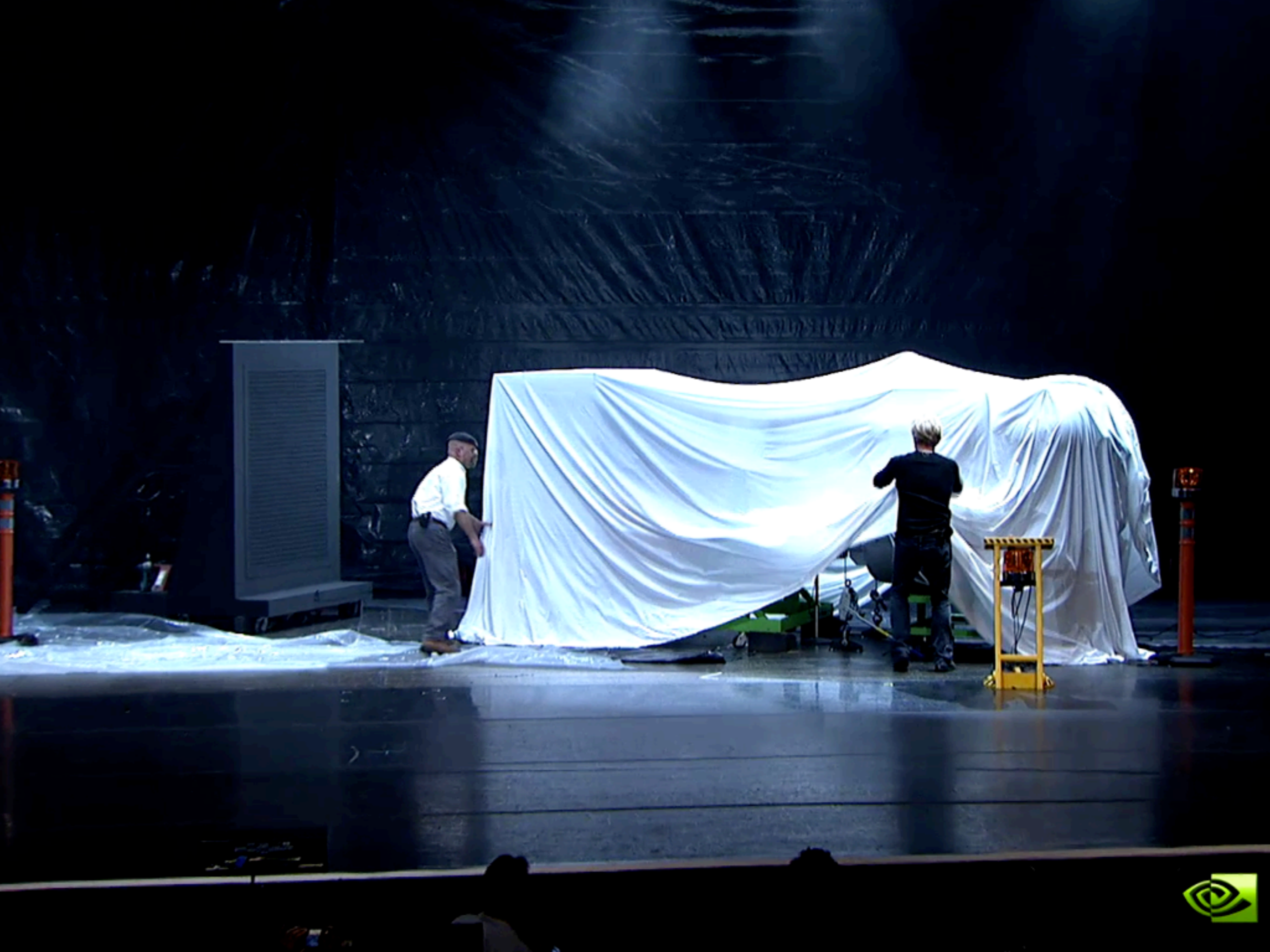


CPU & GPU

You meh' G-Unit











Painting:

The visual representation in memory.

Drawing:

Casting the visual representation onto the screen.

GraphicsContext

“Backing Store”









Not Hardware Accelerated



Hardware Accelerated

Disable Per-Tab Web Processes

Use Buffered Windows

New Buffered Window

Show Caches Window

Show Networking Window

Show Back/Forward Cache Window

Show Frame Rate Meter

Show Render Tree

Show RenderLayer Tree

Start Memory Sampler

Start Stress Test

Start Watchdog Timer

Suppress Alerts

World Leaks ▶

Force Repaint ⌘⌘P

Drawing/Compositing Flags ▶

Miscellaneous Flags ▶

Crash Web Process

Pause Web Process

Go to about:blank Soon



Timeline



Debugger



Console

6

0

0



Inspect



Styles

DOM Tree > html > body > div.background | <> | ≡

Layer Info

Width 1000

Height 367

Paints 8

Memory 5.73

Child Layers

No C

Disable AVFoundation

Disable Accelerated Compositing

Disable Canvas Accelerated Drawing

Disable Full Page Accelerated Drawing in New Windows

Disable QTKit

Disable Tiled Drawing In New Tabs

Host Layers in Safari for Unbuffered Windows

Show Compositing Borders

Show Tiled Scrolling Indicator

Suppress Incremental Rendering

index.html

file:///Users/davearel/Code/loading_test/index.html

Resources Timelines Debugger Console 6 0 0 Inspect Styles Layers Node Resource

index.html DOM Tree html body Layer Info

```
<html>
  <head>_</head>
  <body>
    <div class="background"></div>
    <div id="loading">_</div>
  </body>
</html>
```

Layer Info

No Layer Available

Child Layers

Node	Paints	Memory
div.loading_belly_...	1	147.02 KB
div.background	2	5.73 MB
div#loading	1	5.77 MB

Layer count: 3 Memory: 11.65 MB

Sources Timelines Debugger Console 6 0 0 Inspect Styles Layers Node Resource

index.html > DOM Tree > html > body

```
<head>...</head>  
<body>...</body>
```

Layer Info

No Layer Available

Child Layers

Node	Paints	Memory
div.loading_belly_...	1	147.02 KB
div.loading_belly	1	147.02 KB
div.background	2	5.73 MB


index.html x

file:///Users/davearel/Code/loading_test/index.html

Elements Network Sources Timeline » 1

Console Search Emulation Rendering

FPS: 32.5 5-60



- Show paint rectangles
- Show composited layer borders
- Show FPS meter
- Enable continuous page repainting
- Show potential scroll bottlenecks

The image shows a browser window with a blue background featuring a repeating pattern of food-related icons (pizza, fork, knife, bowl, etc.) and a central white circular logo. The browser's developer tools are open, displaying the 'Rendering' tab. A performance overlay in the top-left corner of the page shows 'FPS: 32.5' and a range of '5-60', with a corresponding line graph below it showing FPS fluctuations. The developer tools interface includes a search bar, a list of tabs (Elements, Network, Sources, Timeline, Console, Search, Emulation, Rendering), and a list of rendering options with checkboxes.

How?!

```
.background, #loading {  
  -webkit-transform: translate3d(0, 0, 0);  
}
```

index.html x

file:///Users/davearel/Code/loading_test/index.html

Elements Network Sources Timeline » 1

```
<div class="background"></div>
<div id="loading">
  <div class="loading_belly"></div>
</div>
```

html body div#loading

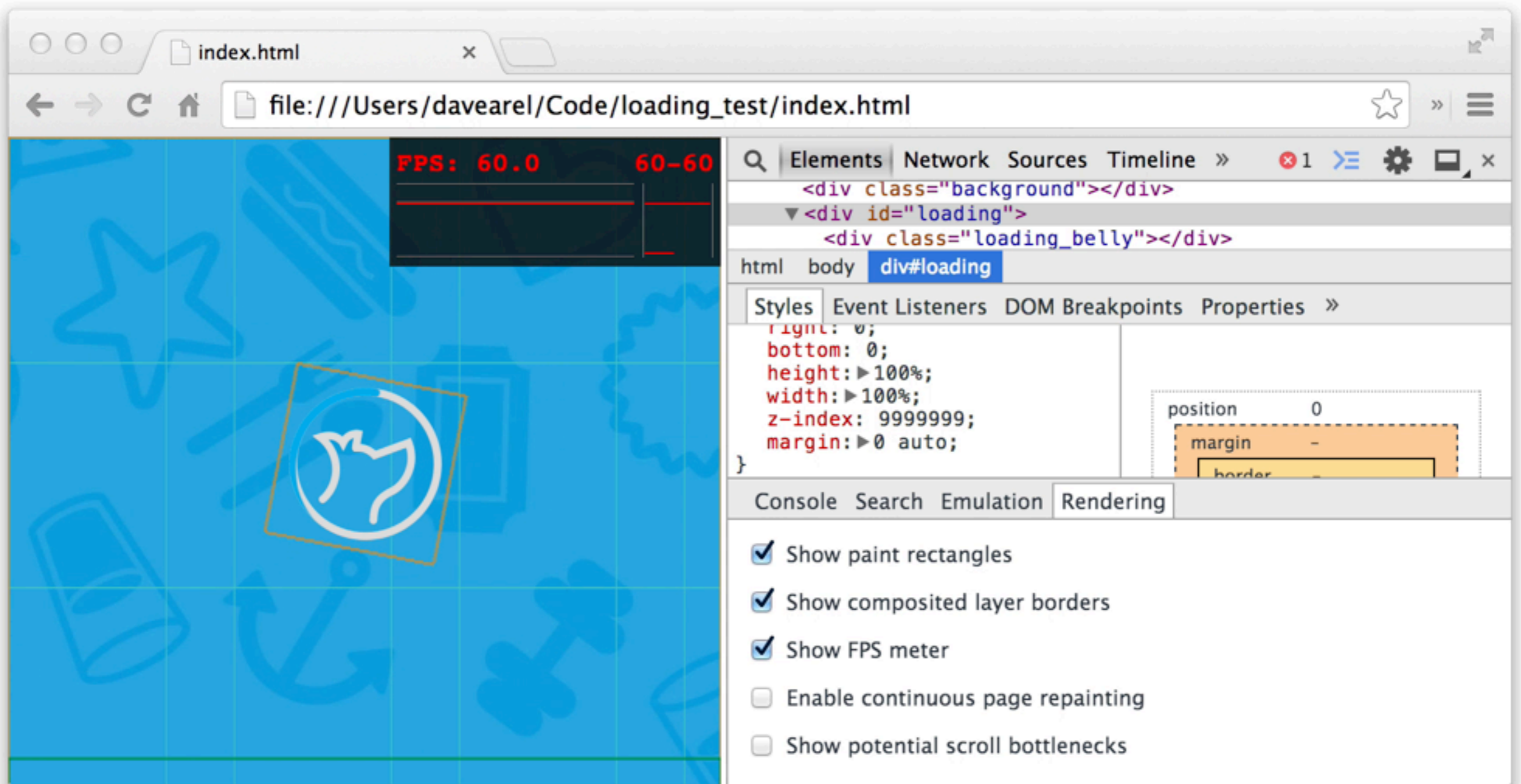
Styles Event Listeners DOM Breakpoints Properties »

```
right: 0;
bottom: 0;
height: 100%;
width: 100%;
z-index: 9999999;
margin: 0 auto;
```

position 0
margin -
border -

Console Search Emulation Rendering

- Show paint rectangles
- Show composited layer borders
- Show FPS meter
- Enable continuous page repainting
- Show potential scroll bottlenecks



“Cacheing”

the free loyalty program.

Check-in with email >

or the app

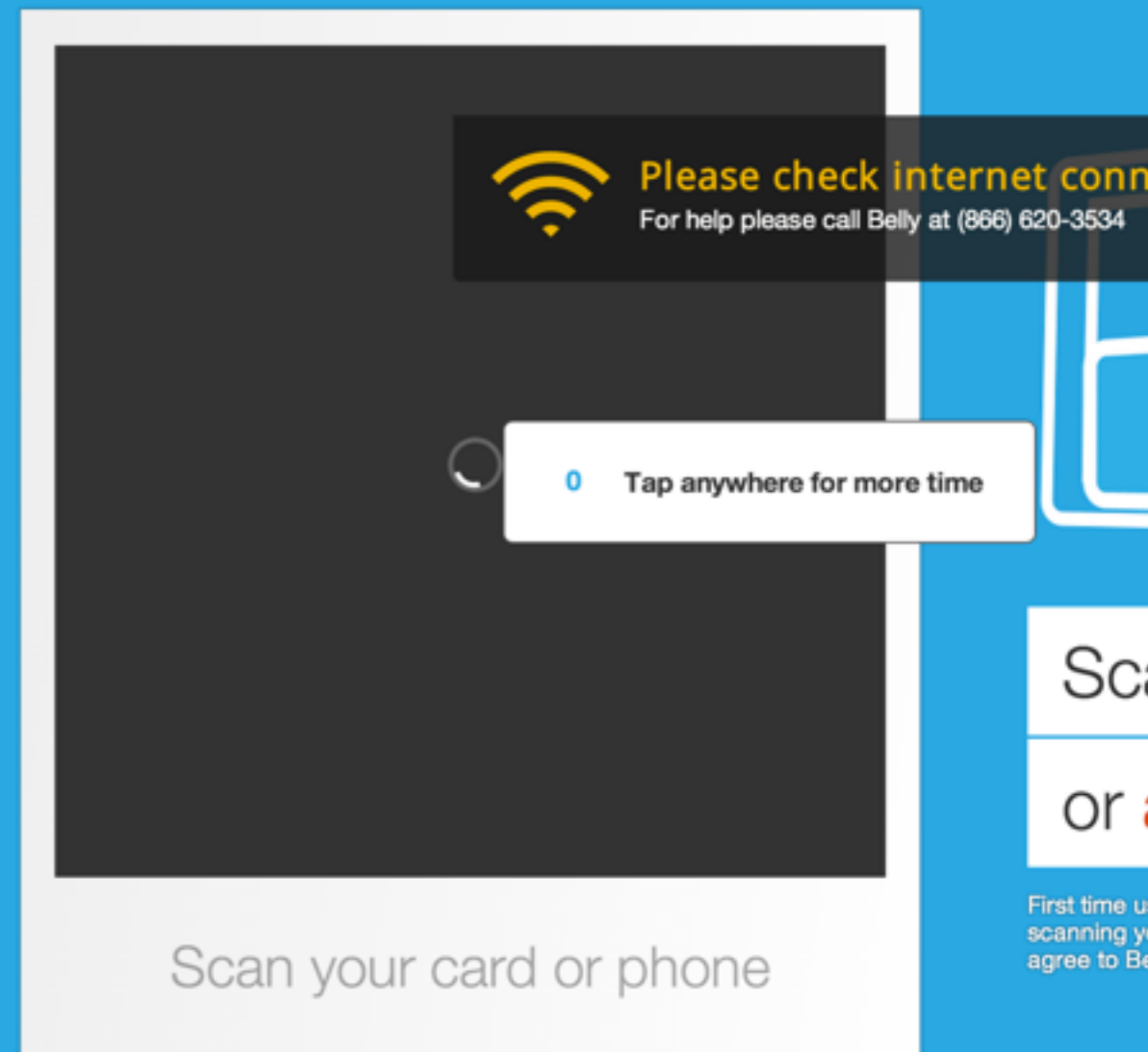
2 Scan the card or app

3 Rack up rewards!

and the stack of cards, **grab one**,

then click that fancy blue button.

TAP TO BELLY >



Scan
or
First time u
scanning y
agree to Be

Child Layers

Node	Paints	Memory
div.flash	12	6.35 MB
component.base_view	4541	3.12 MB
component.base_view	4541	3.12 MB
component.base_view	17	3.00 MB
component.base_view	17	3.00 MB
component	17	3.00 MB
component.base_view.show....	18	3.00 MB
div#app	17	3.00 MB
component.scan	4032	2.68 MB
component.welcome	126	2.68 MB
component.show	16	2.34 MB
div.keyboard.default.show	17	1.75 MB

Cancel

No card? No problem!

Enter your email address to check in.

Check-In

By continuing you agree to Belly's [Terms of Use](#) and [Privacy Policy](#).

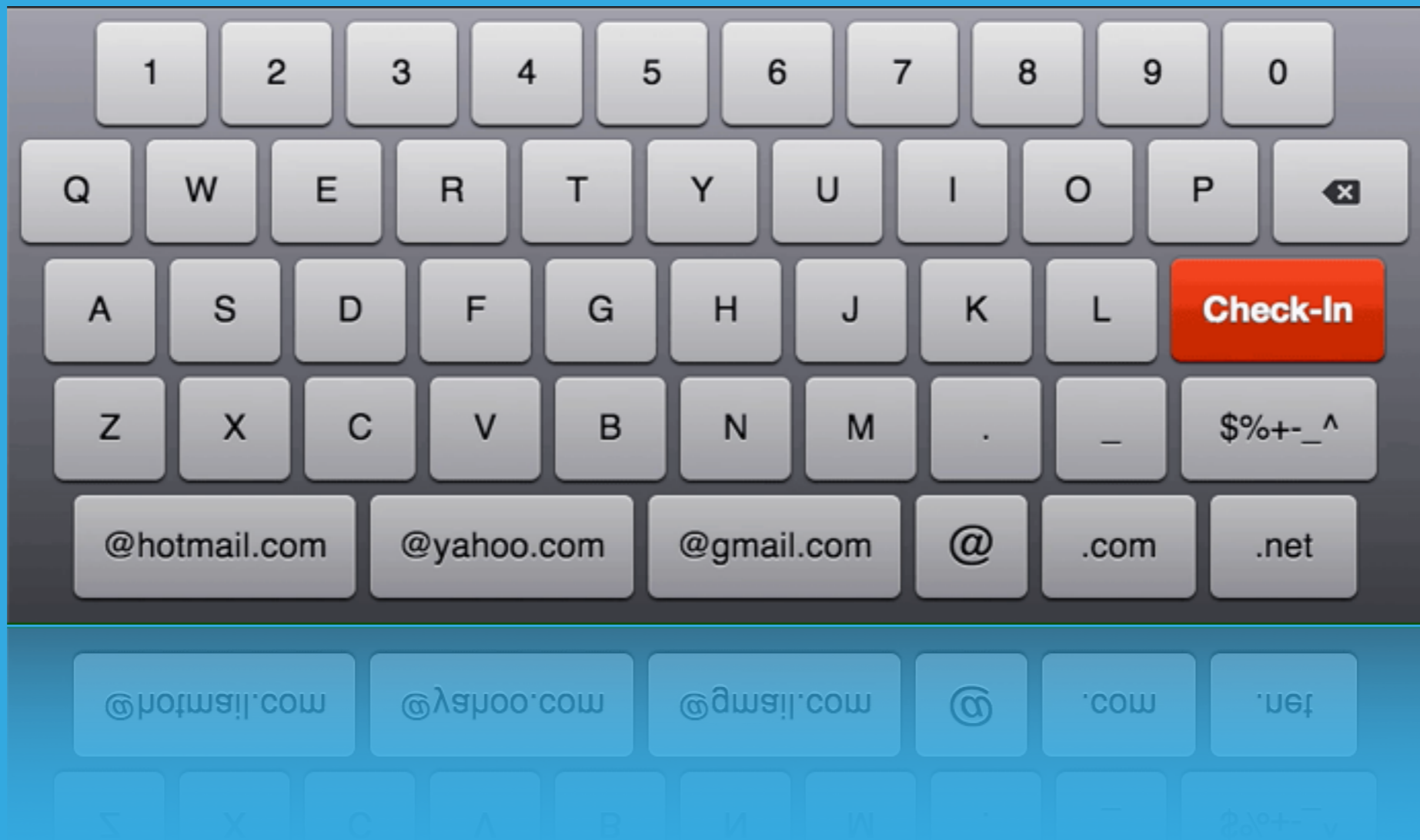
1 2 3 4 5 6 7 8 9 0

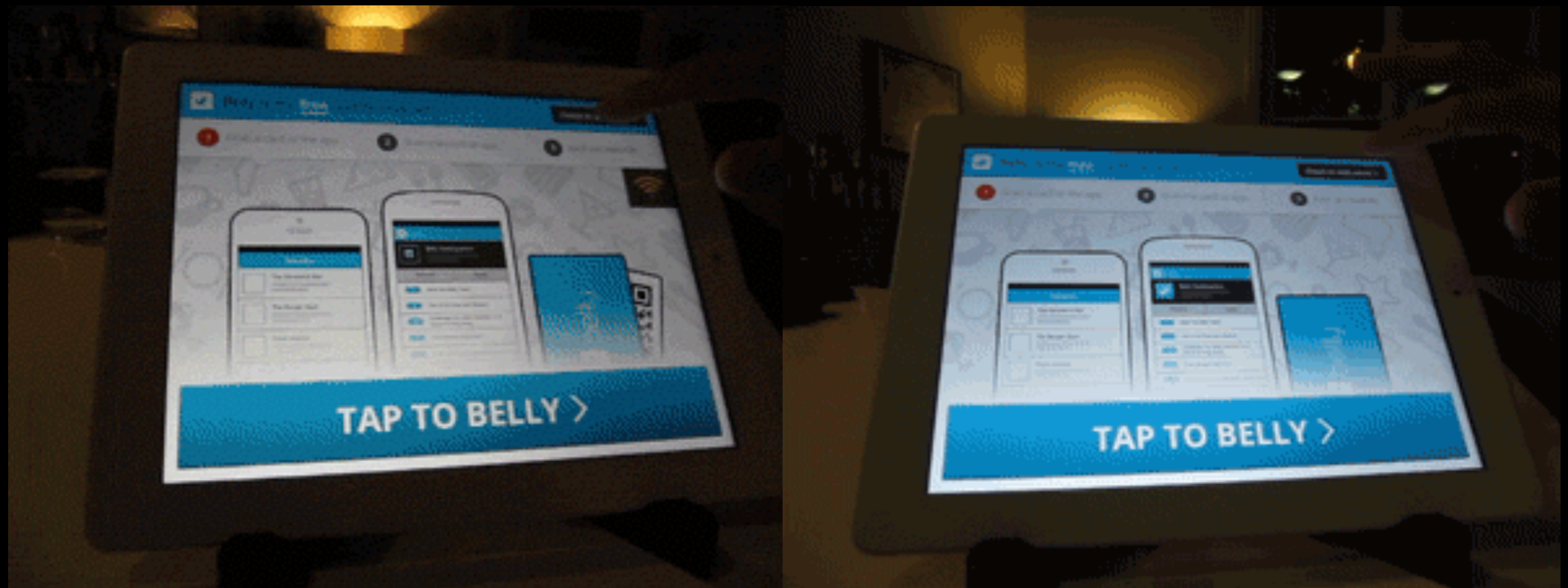
Q W E R T Y U I O P ↵

A S D F G H J K L **Check-In**

Z X C V B N M . _ \$%+ - ^

@hotmail.com @yahoo.com @gmail.com @ .com .net





Reasons for compositing

- Layer has 3D or perspective transform CSS properties
- <video> and <canvas> elements
- CSS animations
- Layer uses accelerated CSS filters
- Layer with a composited descendant has information that needs to be in the composited layer tree, such as a clip or reflection
- Layer has a sibling with a lower z-index which has a compositing layer (in other words the layer is rendered on top of a composited layer)

<http://www.chromium.org/developers/design-documents/gpu-accelerated-compositing-in-chrome>

Tips

- Keep composite layers small
- Composite elements that are updated often (not just animated)
- Compositing layers off screen allows you to buffer / pre-render
- Avoid several texture uploads
- Use Chrome/Safari (or others) to monitor compositing

will-change

The future of compositing

<http://www.w3.org/TR/2014/WD-css-will-change-1-20140429/>



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GET YOUR POINTS >