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Web performance in the real world

How to make fast websites
What is performance?
Page Load Time (PLT)
Page Load Time (PLT)
Animation / Framerate
Animation / Framerate
Responsiveness
Responsiveness

This page is mad busy but you should click this link right here.
What is performance?

- Page Load Time (PLT)
- Animation, framerate
- Responsiveness
- Many more definitions of “fast”
TWO PERSPECTIVES ON PERFORMANCE
Web devs wants to avoid antipatterns.

Browser devs want to make antipatterns *faster*.

– Nolan Lawson

“Web performance in the real world” (the talk you are watching right now)
How web devs see the world

I want my website to be fast on all these browsers...
How browsers see the world

I want my browser to be fast on all these websites...
What’s wrong with this code? */

```javascript
function doStuff(el) {
  el.style.height = 0
  el.getBoundingClientRect()
}

for (var i = 0; i < 5000; i++) {
  doStuff(el)
}
```
/* What’s wrong with this code? */

function doStuff(el) {
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/ What’s wrong with this code? */

function doStuff(el) {
    el.style.height = 0
    el.getBoundingClientRect()
}

for (var i = 0; i < 5000; i++) {
    doStuff(el)
}
0 !== '0px'
Goal
Goal
Goal
Performance Club
Performance Club
Performance Club
Performance Club
PERF CLUB PARTNERS

- NotFlorx
- Toozled
- OwnDroop
- Astro.com
- Aloop Poodle
- Pongo Boy
- Addled Mustache
- Obelisk Wet Angels
- Forested
- Mazerati Tables
- Zorpy.com
- And many more!
You’ve found a perf issue!
You’ve found a perf issue!
You’ve found a perf issue!
SOLUTION: NO SHAME ZONE
Thank you!
Thank you!

...just kidding.
LEARNINGS FROM PERF CLUBS

• Every site is a special snowflake
• You can learn 1,000 perf tricks, then your site needs the 1,001st
• Learn how to learn about perf
TOPICS

• Marks/measures
• Scrolling performance
• IntersectionObserver
Performance marks/measures

• Set a start/end, measure total time
Performance marks/measures
Performance marks/measures
Performance marks/measures

```javascript
performance.mark('start')
doExpensiveThing()
performance.mark('end')
performance.measure('total', 'start', 'end')
const duration = performance
    .getEntriesByType('measure')
    .slice(-1)[0].duration
```
Performance marks/measures

```javascript
performance.mark('start')
doExpensiveThing()
performance.mark('end')
performance.measure('total', 'start', 'end')
const duration = performance.getEntriesByType('measure').slice(-1)[0].duration
```
Performance marks/measures

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Performance marks/measures

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performance.mark('start')
doExpensiveThing()
performance.mark('end')
performance.measure('total', 'start', 'end')
const duration = performance
  .getEntriesByType('measure')
  .slice(-1)[0].duration
```
const marky = require('marky')
marky.mark('total')
doExpensiveThing()
const duration =
    marky.stop('total').duration
const marky = require('marky')
marky.mark('total')
doExpensiveThing()
const duration =
    marky.stop('total').duration
Scrolling performance

• The web is multi-threaded
document.addEventListener('wheel', event => {
    if (someCondition()) {
        event.preventDefault();
    }
});
document.addEventListener('wheel', event => {
    if (someCondition() {
        event.preventDefault();
    }
})
document.addEventListener('wheel', event => {
  if (someCondition()) {
    event.preventDefault();
  }
})
document.addEventListener('wheel', event => {
  if (someCondition()) {
    event.preventDefault()
  }
})
subscroller.addEventListener('wheel', event => {
  if (someCondition()) {
    event.preventDefault();
  }
})
subscroller.addEventListener('wheel', event => {
    if (someCondition()) {
        event.preventDefault();
    }
})
document.addEventListener('scroll', () => {
    /* scroll logic here */
})
document.addEventListener('scroll', () => {
    /* scroll logic here */
})
document.addEventListener('scroll', () => {
    /* scroll logic here */
})
document.addEventListener('wheel', () => {
    /* wheel logic here */
}, {passive: true})
document.addEventListener('wheel', () => {
    /* wheel logic here */
}, {passive: true})
HAVE YOU BLOCKED SCROLLING?
/* THE JANKINATOR */

setInterval(() => {
}, 5000)
/* THE JANKINATOR */

setInterval(() => {
    let start = Date.now()
}, 5000)
/* THE JANKINATOR */

setInterval(() => {
    let start = Date.now()
    while (Date.now() - start < 4000) {
        /* JANK ME AMADEUS */
    }
}, 5000)
31 flavors of scrolling
Scrolling is one of the oldest interactions on the web. Long before we had pull-to-refresh or infinite-loading lists, the humble scrollbar solved the web’s original scaling problem: how can we interact with content that’s stretched beyond the available viewport?
LAST TIP: INTERSECTION OBSERVER
Several expensive `getBoundingClientRect()` calls
IntersectionObserver!
IntersectionObserver!
IntersectionObserver!
```json
{
  "isIntersecting": false,
  "intersectionRatio": 0,
  "time": 50977.05268970587,
  "rootBounds": {
    "top": 210,
    "left": 530.5,
    "bottom": 510,
    "right": 830.5,
    "height": 300,
    "width": 300
  },
  "boundingClientRect": {
    "top": 593,
    "left": 530.5,
    "bottom": 638,
    "right": 830.5,
    "height": 45,
    "width": 300
  },
  "target": <HTMLElement>
}
```
const outer = document.getElementById('outer')
const inner = document.getElementById('inner')
```javascript
const outer = document.getElementById('outer')
const inner = document.getElementById('inner')

const observer = new IntersectionObserver(
    callback, {root: outer}
)
observer.observe(inner)
```
```javascript
const outer = document.getElementById('outer')
const inner = document.getElementById('inner')

const observer = new IntersectionObserver(
  callback, {root: outer}
)
observer.observe(inner)

function callback(entries) {
  for (let entry of entries) {
    const innerRect = entry.boundingClientRect
    const outerRect = entry.rootBounds
    /* your code here */
  }
}
```
const outer = document.getElementById('outer')
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observer.observe(inner)

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  for (let entry of entries) {
    const innerRect = entry.boundingClientRect
    const outerRect = entry.rootBounds
    /* your code here */
  }
}
Use IntersectionObserver for...

- Virtual lists
- Ads
- Ellipsis effects
- Anything where one box is on top of another box
REVIEW

• Marks/measures
• Scrolling performance
• IntersectionObserver
CONCLUSION

• Perf is more than “fast”
• 1000 tips aren’t always enough
• Measure, measure, measure
• Test on slow machines
• Test iteratively
DO A PERF CLUB

perfclub@microsoft.com
Thank you!

DECK & RESOURCES

aka.ms/summit2017perf

TWITTER

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GITHUB

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