

# Web Browsers

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# Table of Contents

- What is a browser?
  - Why should I care?
- Brief History
  - Early Years
  - First Browser War
  - Second Browser War
  - Current Day & Future?
- Major Browsers Past & Today
- FireFox Propaganda



# What is a web browser?

Why should I care?  
And what's in it for me?

What is a web browser?

- According to most users it's the big blue E.





What is a web browser?

*“A software application for retrieving, presenting and traversing information resources on the World Wide Web” (Wikipedia)*

Well blah! That's boring!

Let's think about what we can use them for?



# Why Should I Care/What Can MY Browser Do?

- Browse the Internet
  - Huh, I would have never thought of that...

# Why Should I Care/What Can MY Browser Do?

- Browse the Internet
- Access to information at your fingertips.
- Entertainment



# Why Should I Care/What Can MY Browser Do?

- Browse the Internet
- Access to information at your fingertips.
  - Vandalize Wikipedia!
  - Learn about all the hot sexy singles in your area!
- Entertainment
  - These sites are only slightly shady...
  - And TOTALLY legal.

# Why Should I Care/What Can MY Browser Do?

- Connect with people anywhere in the world
  - Email & Chatrooms
  - Social Media
  - Blog Comments
  - VoIP



# Why Should I Care/What Can MY Browser Do?

- Connect with people anywhere in the world
  - Email & Chatrooms
    - Make new friends on Chat Roulette!
    - KAPPA
  - Social Media
    - I can be a SJW on Tumblr!
  - Blog Comments
    - All of the insightful YouTube comments.
  - VoIP
    - ...I got nothing. Yet.

# Why Should I Care/What Can MY Browser Do?

- Browse the Internet
  - Access to information at your fingertips.
  - Entertainment
- Connect with people anywhere in the world
  - Email & Chatrooms
  - VoIP
  - Social Media
- Play/Edit media
  - Stream Music, Online Video, Live Streams
  - Edit Photos



# Why Should I Care/What Can MY Browser Do?

- Read Books/Documents - PDFs, eBooks
- Create documents & presentations

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- Shitty (and awesome) Flash games
- Actual games such as FTL, Bastion, Super Hexagon (asm.js, NaCl)

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- Create documents & presentations
- SSH, FTP, Torrent, Remote Desktop Connection
- Develop using cloud based IDEs
- Shitty (and awesome) Flash games
- Actual games such as FTL, Bastion, Super Hexagon (asm.js, NaCl)
- Be an OS? (ChromeOS, FirefoxOS) - Difficult to argue.
- Virtual Reality? (Mozilla & Oculus Rift)



tl;dr - A lot more stuff than you thought.

## Brief History



# Brief History - What's a Browser?

- First web browser was WorldWideWeb.
  - For the NeXTstep platform.
    - Original code base for OS X.
- Developed by Tim Berners-Lee.

# Brief History - Answer? Magic!

- First web browser was WorldWideWeb.
  - For the NeXTstep platform.
    - Original code base for OS X.
- Developed by Tim Berners-Lee.
- Released December 25, 1990
  - 24 years ago!
- Currently released under public domain.



# Brief History - Mosaic Years

- Many new browsers by 1993.
- Most influential:
  - NCSA Mosaic Browser
  - National Center for Supercomputing Applications
- By October 1994, Wired stated...  
*“well on its way to becoming the world's standard interface.”*

# Brief History - Mosaic Years

- Marc Andreessen, a Mosaic developer founded Mosaic Communications Corporation.
  - Released Mosaic Netscape.



# Brief History - ~~Mosaic~~ Netscape Years

- Marc Andreessen, a Mosaic developer founded Mosaic Communications Corporation.
  - Released Mosaic Netscape.
- Legal issues ensued.
  - Renamed to Netscape Communications Corporation
  - Similarly - Netscape Navigator.
- Held majority market share.

# Brief History - Microsoft Joins the Fray

- Microsoft and Internet Explorer in 1995.
  - Licensed Mosaic to create Internet Explorer 1.0.
  - Released in MS Windows 95 Plus! Pack in August that year.



# Brief History - Microsoft Joins the Fray

- Microsoft and Internet Explorer in 1995.
  - Licensed Mosaic to create Internet Explorer 1.0.
  - Released in MS Windows 95 Plus! Pack in August that year.
- Netscape held 86% market share by 1996.
  - Microsoft didn't like that...
- The First Browser War had begun.

# Quick Sidenote - IT'S IMPORTANT MKAY

- Why does it matter?
- Popular web browser → Lots of money involved.
  - Default search engine deals.
  - Default bookmark list.
  - Lots of influence.



# Brief History - MUH NEW FEATURES

- Period of rapid development.
  - IE 2.0 released three months after 1.0.
  - NN and IE added tons of new features.
- *NEW FEATURES* >  $\infty$  > Boring bug fixes.

# Brief History - Why aren't we winning yet?

- IE 4.0 changed the tide.
  - Was faster than NN 4.0.
  - Adopted W3C standards more faithfully.
- Netscape still had 72% in 1997.
- MS decided it was time to try some new tactics...



# Brief History - Wait a minute...

- Netscape derived most of its revenue from Navigator.
  - MS had this thing called Windows.
- Speaking of which...
  - Windows had an OS monopoly.
- This is gonna sound crazy but...

# Brief History - You're right. It's crazy.

- Netscape derived most of its revenue from Navigator.
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- Speaking of which...
  - Windows had an OS monopoly.
- This is gonna sound crazy but...
  - What if IE came with Windows?



# Brief History - Windows prints money!

- MS integrated IE with Windows.
  - Good or bad, it increased market share.
- Windows printed money!
  - Free with Windows OS
  - Funded development & marketing.
- Money = Power
  - See Congress for additional details.

# Brief History - We have infinite monies!

- Licensing agreements with OEMs.
  - Required IE on desktop.
  - Penalized for shipping with Netscape.
- Allowed ISPs to release branded versions of IE
- Agreement with AOL to base interface off IE.
- Purchased and released FrontPage.
  - Web authoring tool
  - Created pages that looked better in IE.



# Brief History - It's working!

- Devastating effect
  - Reversed market share within 2 years (~1998).
  - Attained 96% at peak in 2002.
- Netscape couldn't fund their product anymore.
  - Open sourced their product.
  - Mozilla was born.
- Thus ends the first browser war.

# Brief History - It worked! But why?

- Why did this work?
  - I thought Navigator was free...
- Netscape's business model
  - Browser for free.
  - Sell server software.



# Brief History - Aim for the head ~~head~~ air supply!

- MS attacked their revenue stream.
- Bundled Internet Information Server web sever for “free” with Windows server versions.
- Offered MS customers clones of Netscape’s other severs.
- Designed to “cut off Netscape’s air supply.”

# Brief History - WE WON! YEAH!

- Microsoft's IE had killed Netscape Navigator.



# Brief History - Damn it, not again...

- Microsoft's IE had killed Netscape Navigator.
- From the ashes of its dead predecessor arose (Mozilla) Phoenix.
  - Renamed to Firebird due to trademark issues.
  - Renamed again to Firefox in 2004.
- MS released IE6 in 2001.
- Mozilla ~~Firefox~~ Firebird in 2002.
- Apple Safari in 2003.

# Brief History - Round Two! FIGHT!

- Microsoft's IE had killed Netscape Navigator.
- From the ashes of its dead predecessor arose (Mozilla) Phoenix.
  - Renamed to Firebird due to trademark issues.
  - Renamed again to Firefox in 2004.
- MS released IE6 in 2001.
- Mozilla Firefox Firebird in 2002.
- Apple Safari in 2003.
- And so begins the second browser war.



# Brief History - Ohh look! Shiny new features!

- Opera
  - Tabbed browsing, mouse gestures, BitTorrent client
  - First to pass Acid2 test.
- IE7
  - Search bar, Last to pass Acid2.
- Firefox
  - 2.0 - Reopen closed tabs, session restore, spell checker.
  - 3.5 - Native audio/video, private browsing.
- Safari
  - Webkit engine released in 2002/2003.
- Google Chrome released in 2008.
  - Sandboxing

# Brief History - Today

- Chrome and Firefox have dethroned Internet Explorer.
  - Massive props to Google's war chest and Mozilla's stubbornness.
- Massive innovation and changes take place.
  - Flash still completely not dead.
  - HTML5 please save us!
- Mobile browsers surging.
  - Safari, Chrome on iOS.
  - Chrome, Firefox on Android.
  - IE on Windows Mobile.



# IE6 PLS

- IE6 is still a zombie.
- As of Jan 2015, IE6 is used less than 1% in most countries.
- China is 2.3% and Venezuela is 1.2%

# Future?

- Not sure how browsers will evolve.
- With extensions, they can do crazy things.
  - Far beyond what people thought we could do 5 years ago.
- Going back to earlier...
  - Cloud based development w/online workspaces?
  - Plugin-free games.
  - Be an OS (FirefoxOS?)
  - Virtual reality support.
- Only two things are certain.



# Please die.

- Flash still sucks.
- IE6 will remain a zombie.

## ~~Brief~~ History

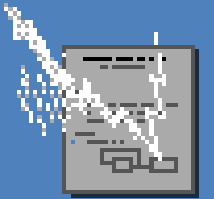
OK, so maybe it wasn't so brief.

Moving on.



# Major Browsers, Past and Current

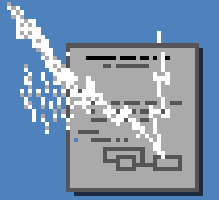
# WorldWideWeb



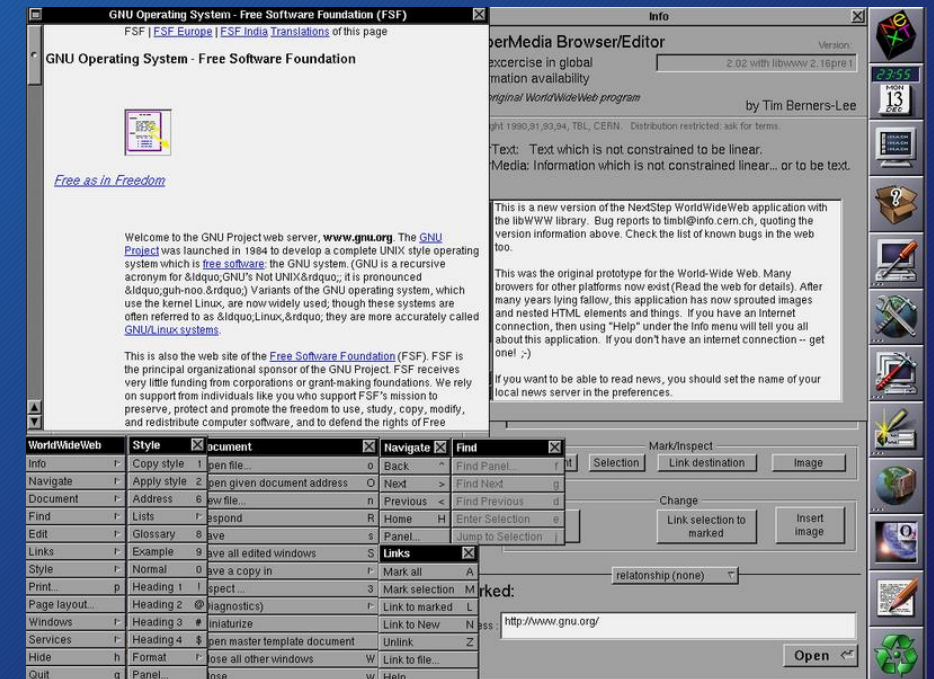
*The very first.*



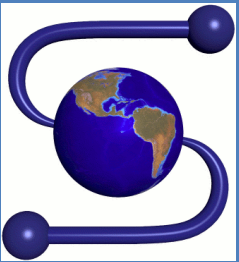
# WorldWideWeb



- Initial Release: 25 December 1990
  - 24 years ago.
- Developer: Tim Berners-Lee for CERN
- OS: NeXTstep
- Written in: Objective-C
- JS Engine: What's JavaScript?
- Claim to fame: First web browser released.
- Discontinued as of Jan 1994.
  - Currently in public domain.



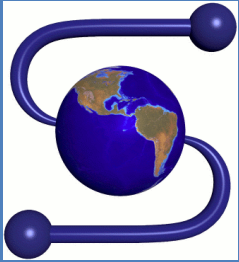
# NCSA Mosaic



*Most influential?*



# NCSA Mosaic



- Initial Release: 23 Jan 1993
  - 23 years ago.
- Developer: NCSA
- OS: AmigaOS, Mac OS, Unix, Windows
- Written in: C
- JS Engine: What's JavaScript?
- Proprietary License.
- Claim to fame: The big 4 retain many characteristics of the Mosaic browser. Including a:
  - GUI
  - URL bar
  - Forward/back/reload buttons



# Microsoft Internet Explorer



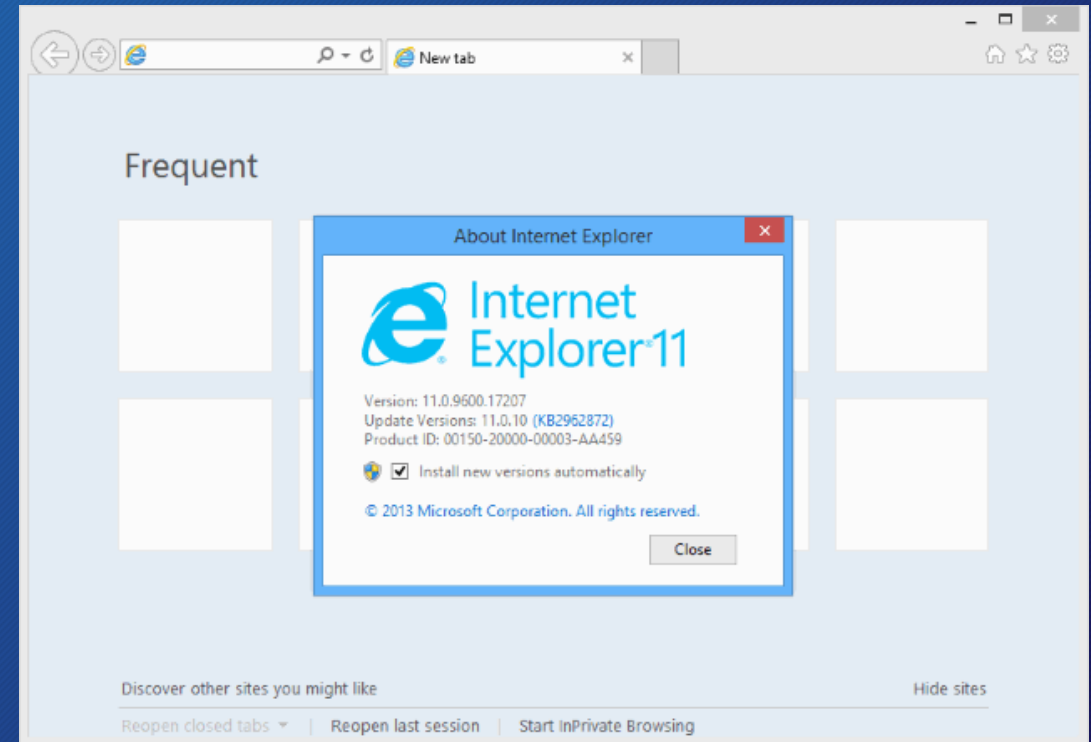
*The browser to download other browsers.*



# Internet Explorer



- Initial Release: 16 August 1995
  - 19 years ago.
- Developer: Microsoft Corporation
- Latest Release: IE11
- OS: Windows, XBox, Windows Mobile
- Written in: C++
- JS Engine: Trident, Chakra, EdgeHTML (W10 only)
- Proprietary License.
- Claim to fame:
  - Being a web developer's favourite browser to test with.
  - And always following accepted standards.
  - Biggest market share at peak.



# Microsoft Project Spartan



*To escape the legacy of IE.*



# Project Spartan



- Initial Release: With Windows 10.
  - 2015?
- Developer: Microsoft Corporation
- OS: Windows 10, Windows Mobile
- Written in: C++
- JS Engine: EdgeHTML
- Proprietary License.
- Claim to fame:
  - It's not IE.
  - Standards support!
  - Extensions?



# Netscape Navigator



*The loser.*



# Netscape Navigator



- Initial Release: 15 December 1994
  - 20 years ago.
- Developer: Netscape Communications Corp.
- OS: Cross-Platform
- Proprietary License.
- Claim to fame:
  - Loser of the first browser war.



# Mozilla Firefox



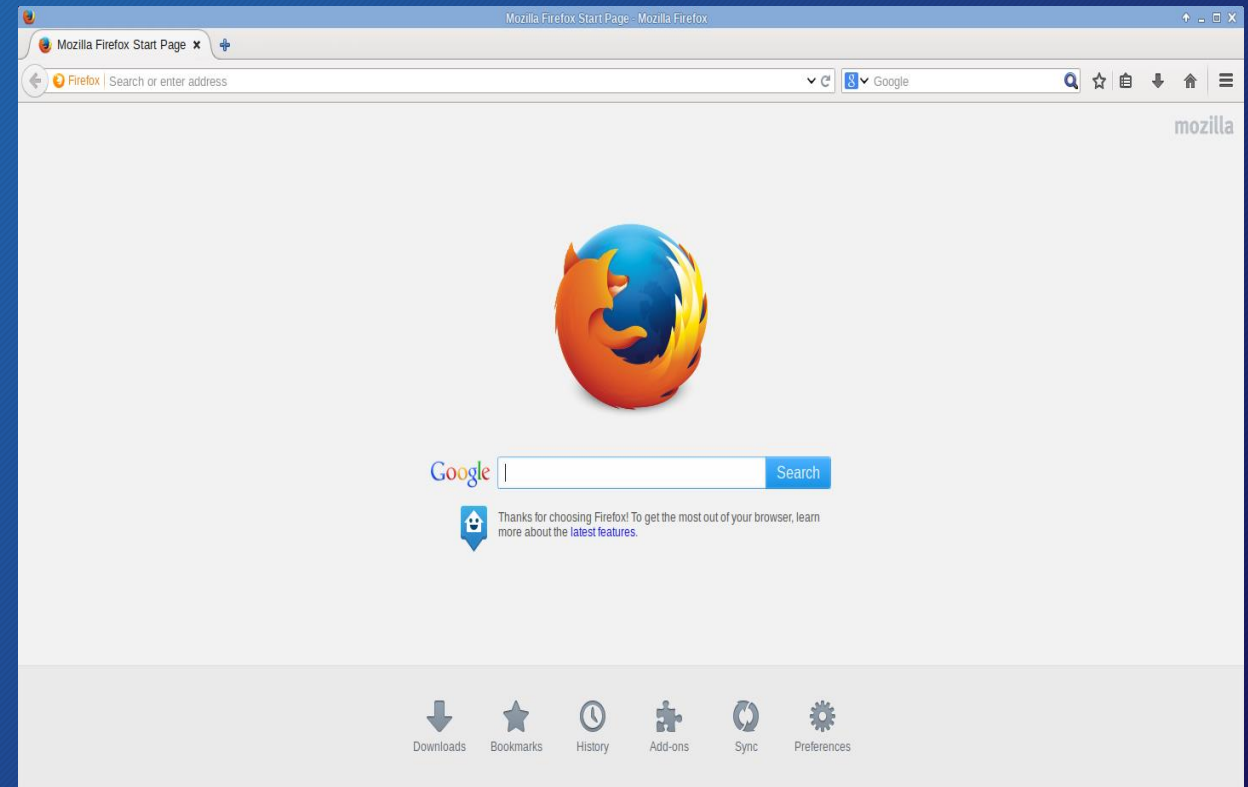
*Different by Design.*



# Mozilla Firefox



- Initial Release: 23 September 2002
  - 12 years ago.
- Developer: Mozilla Corporation
- Latest Release: 36 (Stable Branch)
- OS: Windows, Mac, UNIX, Android, FirefoxOS
- Written in: C++, JS, C, CSS, XUL, XBL
- JS Engine: Gecko, Servo (experimental)
- Mozilla Public License 2.0
- Claim to fame:
  - Open Source
  - Extremely customizable.



# Apple Safari



Comes free with your FaceBook machine!



# Apple Safari



- Initial Release: 7 January 2003
  - 12 years ago.
- Developer: Apple Inc.
- Latest Release: 8.0.3 (for OS X Yosemite)
- OS: Mac, iOS
- Written in: C++, Objective-C
- JS Engine: WebKit, Nitro
- Freeware, some parts GNU LGPL
- Claim to fame:
  - Apple products only.
  - iOS version did not remove Flash.



# Google Chrome



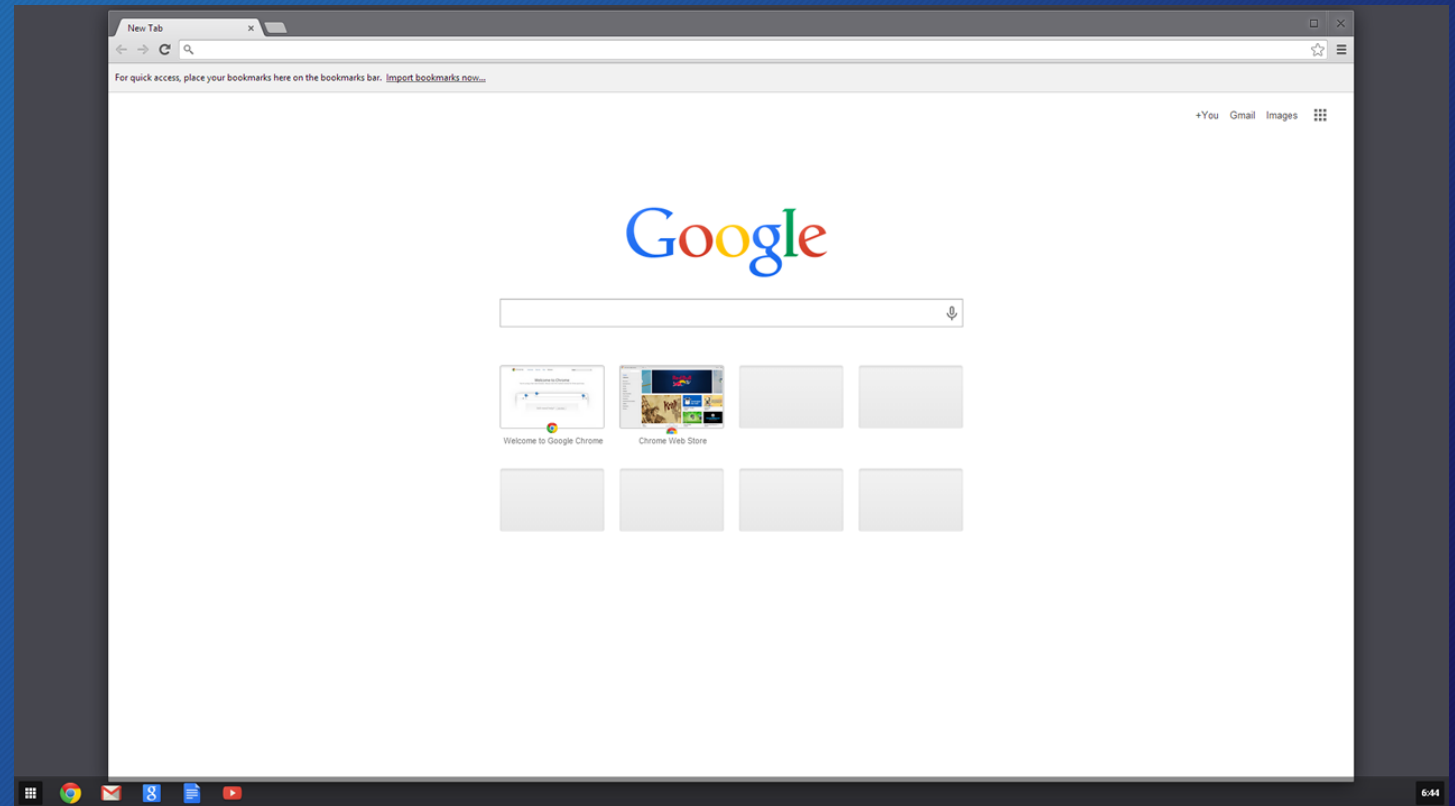
*Give us your personal data!*



# Google Chrome



- Initial Release: 2 September 2008
  - 6 years ago.
- Developer: Google Inc.
- Latest Release: 40.something
- OS: Windows, Mac, UNIX, Android, iOS
- Written in: C++
- JS Engine: ~~WebKit~~ Blink
- Google Chrome is closed source.
  - Chromium is open source.
- Claim to fame:
  - Sandboxing model.
  - Google's war chest.
  - 6 week release cycle.



Opera



*~~The Pioneer~~*

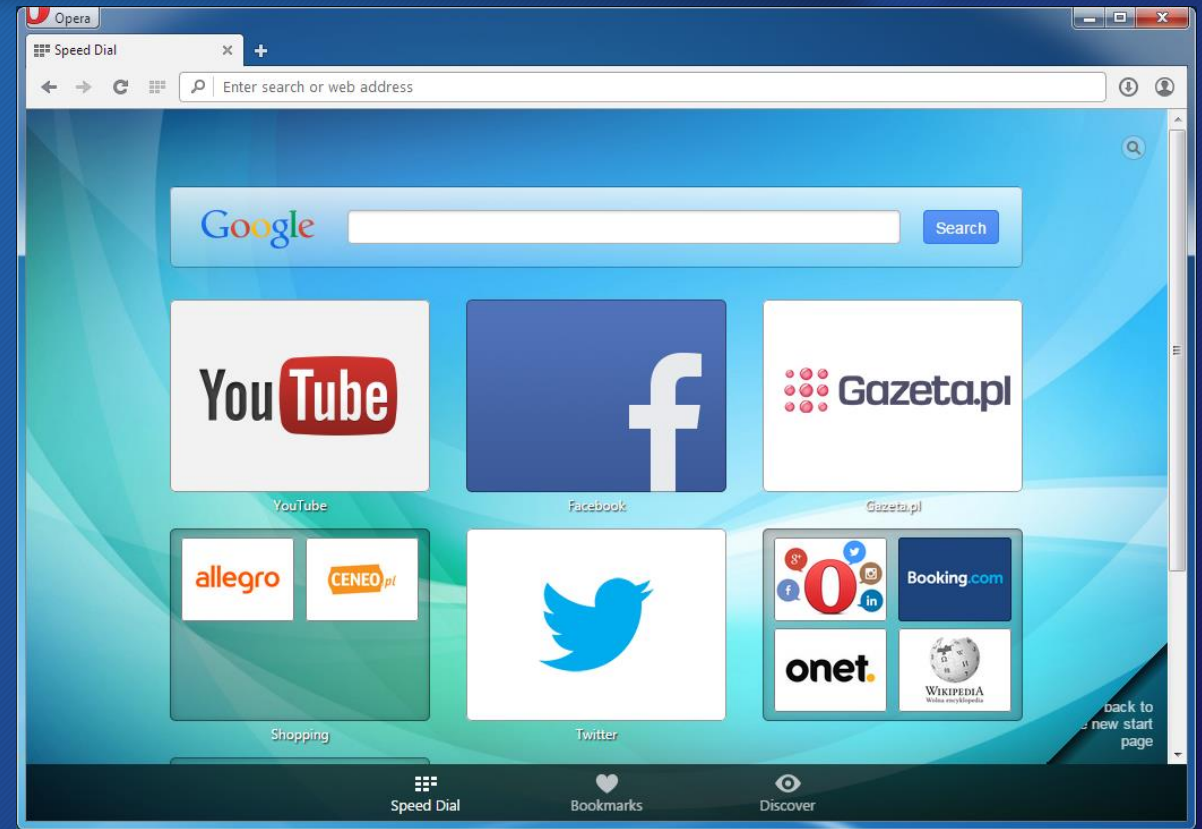
*~~Google~~ Googleless Chrome*



# Opera



- Initial Release: 1995
  - ~19/20 years ago
- Developer: Opera Software
- Latest Release: 27.something
- OS: Everything
- Written in: C++
- JS Engine: Presto Blink, V8
- Claim to fame:
  - Used to be very innovative & feature rich
  - Tabs, Speed Dial, Pop-up blockers, Browser Sessions, etc.
  - Built in mail client, extension support, etc.
  - Is now essentially Chrome without Google branding.



Vivaldi



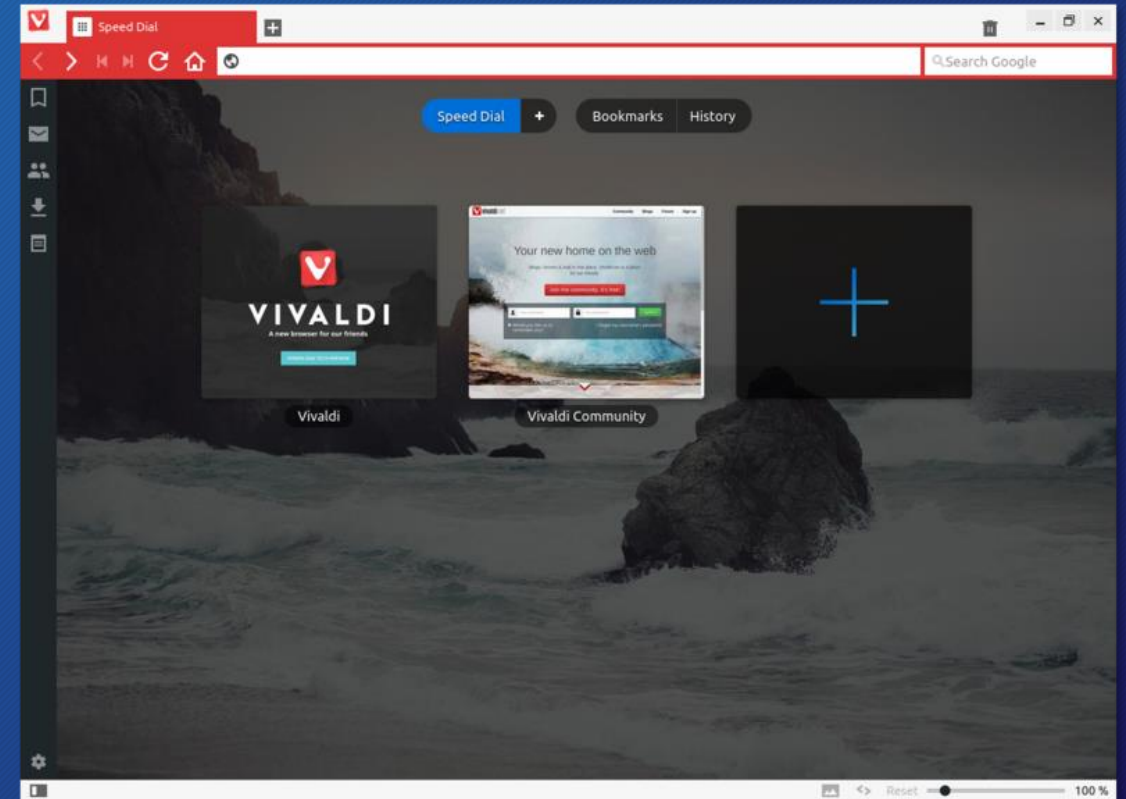
*Opera with features.  
Or as it used to be known, Opera.*



# Vivaldi



- Initial Release: In (public) preview
- Developer: Vivaldi Technologies
- OS: Windows, Linux, OS X
- Written in: HTML5, Node.js, ReactJS
- JS Engine: Blink
- Claim to fame:
  - Meant to be a browser for power users.



# Open Source Browsers

*They're there.*

*They exist.*

*Firefox is nice.*

*Chromium is pretty good.*



# Open Source Browsers

- Midori
- Lynx
- Epiphany
- Konqueror
- Flock
- Emacs (with a plugin)

# Firefox Propaganda