EMPOWER EMPLOYEES TO BROWSE FASTER WITH MICROSOFT EDGE

The people in your organization are continuously connected to limitless information via the Internet. Whether they're using their browser for work-related tasks or taking a quick break to manage their personal lives, a better browser can improve productivity. Microsoft Edge aims to deliver a web that is more responsive due to quicker loading and new features that can limit distraction.

Microsoft commissioned Principled Technologies to compare Microsoft Edge to two other popular browsers—Google Chrome and Mozilla Firefox—to see how it could save time and improve productivity. We found that Microsoft Edge loaded the majority of websites faster than the other browsers, with some pages loading as much as 44 percent faster compared to Google Chrome. That means more immediate access to information and less frustration for users, who can use their extra time to get more done.

This faster performance meant that Microsoft Edge was also a median of 26 percent quicker at completing some common work scenarios than in Chrome. And in our benchmark tests, Microsoft Edge delivered better performance while browsing on battery, so you know your browsing speed won't suffer when you can't plug in.

The time saved with Microsoft Edge can really add up over the course of a workday where employees are checking mail, researching on the web, or collaborating through file sharing or sales portal sites.

SAVE TIME. GET MORE PRODUCTIVE.

In business, speed is everything. In today's corporate settings, so much of what workers do day-to-day involves accessing sites and files through web browsers. You don't want the people in your organization to be held back by sluggish web browsers while they're trying to get their work done. That's why we compared Microsoft Edge to Chrome and Firefox in a number of ways: pages loads, common scenarios, and benchmarks. We used the same laptop system for all testing (see Appendix A for details) running Windows® 10 (build 10586, also known as Threshold 2) to make sure the browsers could take every advantage of up-to-date software. To have a look at the detailed steps we followed in our testing, visit Appendix B.

Faster page loads with Microsoft Edge

When you're waiting for a page to load, even hundredths of a second can be perceptible. Palpable browsing lag can lead to frustration and distraction, which can really hurt employee productivity. We selected the top 100 websites (as reported by Alexa on 11/9/15) and used each browser to load them all.

Microsoft Edge loaded 88 percent of those web pages faster than Chrome and 79 percent of websites faster than Firefox. As Figure 1 shows, Microsoft Edge loaded pages up to 44 percent faster than Chrome, based on median times we measured for the 100 websites. This means that every browser-related task could give a slight boost to employee productivity that adds up throughout the workday. For detailed results for each website, see Appendix C.

Page load

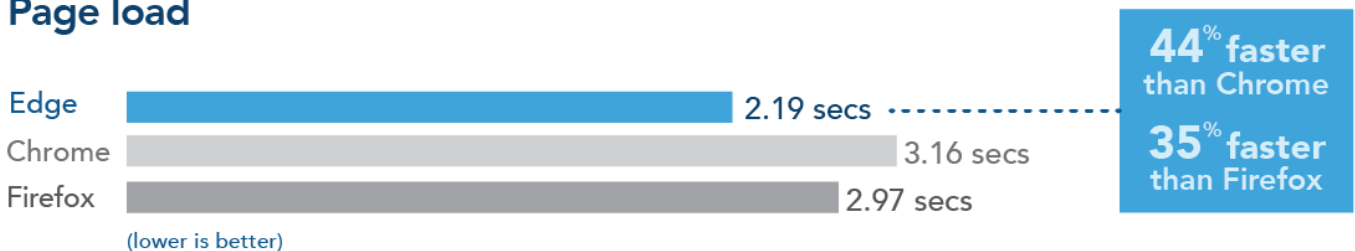|		
Edge	2.19 secs	44% faster than Chrome
Chrome	3.16 secs	35% faster than Firefox
Firefox	2.97 secs	

(lower is better)

Figure 1: Microsoft Edge loaded pages up to 44 percent faster than Chrome.

For the timings in Figure 1, we cleared the cache in each browser before each page load we timed. Because users often leave their browsers open and simply refresh popular pages, we tested the top 10 pages from Alexa plus an additional 15 pages randomly chosen from the top 100, measuring the page refresh time in each browser. This sample should reflect the sites most users visit. Microsoft Edge refreshed 56 percent of the pages more quickly than Chrome and 72 percent of the pages more

quickly than Firefox. Adding the refresh times together for these 25 sites, Microsoft Edge reduced the time over Firefox by 5 percent, but increased refresh times over Chrome by 10 percent. Chrome clocked in at 56 seconds, Microsoft Edge at 62 seconds, and Firefox at 65 seconds. This means that employees who choose to refresh pages in their browser could still realize time saving advantages by using Microsoft Edge. See Figure 9 in Appendix C for detailed results.

What this means for the workplace

Now that we've determined Microsoft Edge was generally faster at loading pages, it's time to see how that performance might affect a worker's productivity throughout the course of the day. We tested three scenarios: an employee beginning the day, collaborating in a group, and working remotely. In all three, Microsoft Edge completed tasks faster than Chrome or Firefox.
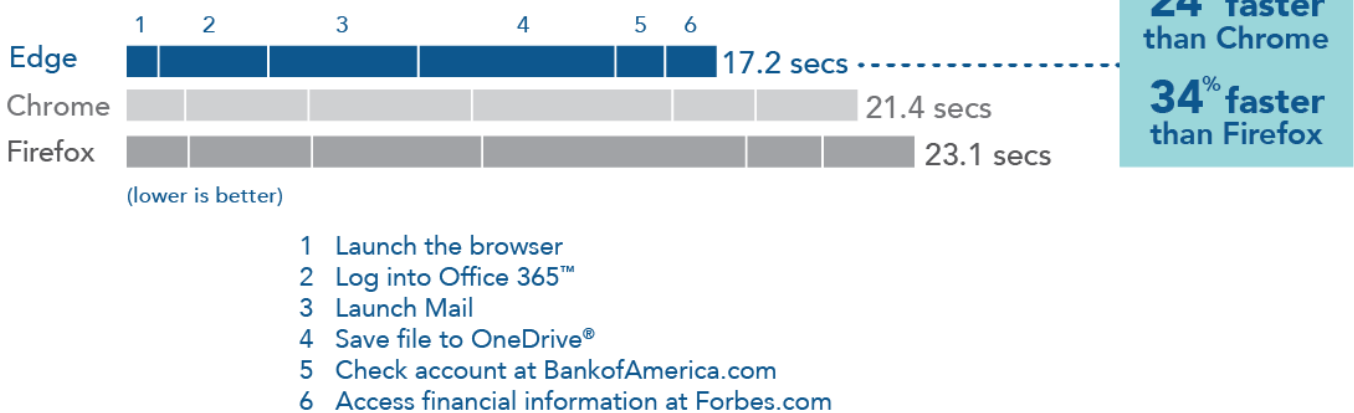
Beginning the day

	1	2	3	4	5	6	
Edge							17.2 secs — 24% faster than Chrome
Chrome							21.4 secs
Firefox							23.1 secs — 34% faster than Firefox

(lower is better)

1 Launch the browser
2 Log into Office 365™
3 Launch Mail
4 Save file to OneDrive®
5 Check account at BankofAmerica.com
6 Access financial information at Forbes.com

Figure 2: Microsoft Edge could help workers get to work faster.

Meet Sally. Sally gets into the office a little before 9AM and opens her laptop. Once it boots, she launches her web browser and logs into Office 365. From there, she opens her mail and finds an attachment she needs to work on later. Sally saves the file to her OneDrive. She then goes to Bank of America and Forbes to check on financial information that will inform her focus for the day.

As Figure 2 shows, Microsoft Edge helped Sally complete tasks up to 34 percent faster compared to Firefox. And that's just the beginning. As her day unfolds and she checks her email and visits other sites, Microsoft Edge could keep Sally focused and more productive by saving her time and frustration.

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Working on a project

Edge — 42.1 secs
Chrome — 53.5 secs
Firefox — 49.4 secs

(lower is better)

27% faster than Chrome

17% faster than Firefox

1 Launch Delve™
2 Edit large Word document
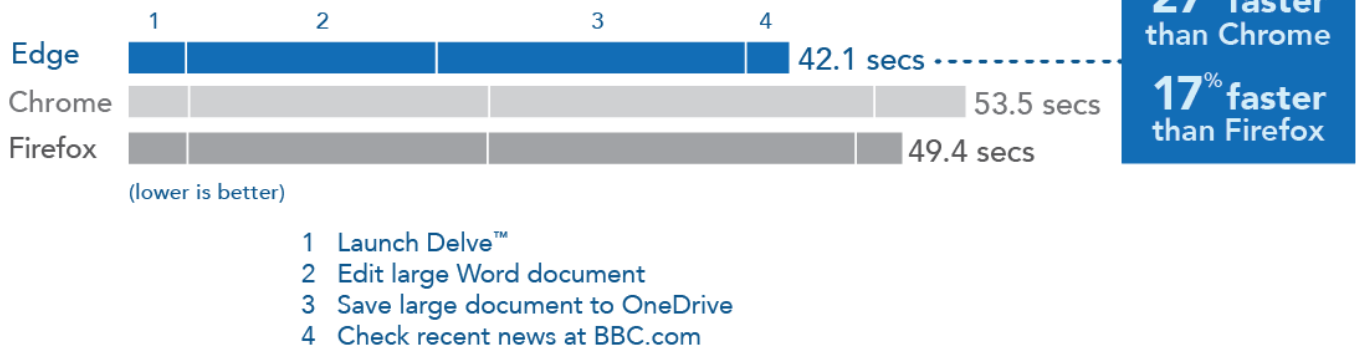3 Save large document to OneDrive
4 Check recent news at BBC.com

Figure 3: For working on a project, Microsoft Edge can save valuable time.

Meet Jamal. Jamal leads a small office team, which is currently working together on a shared document. He launches Delve on Office 365 to find the file's most recent version. He chooses to edit the large Word document in Word Online, and then saves his progress to OneDrive for future work. Because the project deals with international clients, Jamal checks BBC's website for recent news from the client's home country.

As Figure 3 shows, Microsoft Edge could make group collaboration tasks up to 27 percent faster for Jamal and his team compared to Chrome. And every member of the team would reap the benefit of the faster browser as they pass the document back and forth. The ability to collaborate more quickly and without frustration can help the group work together better and wrap up the project on schedule.
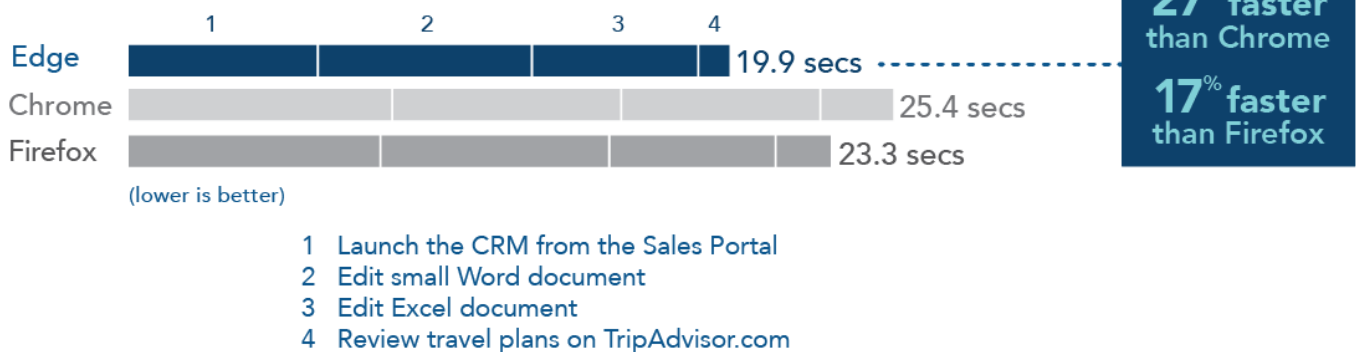
Working remotely and on battery

Edge — 19.9 secs
Chrome — 25.4 secs
Firefox — 23.3 secs

(lower is better)

27% faster than Chrome

17% faster than Firefox

1 Launch the CRM from the Sales Portal
2 Edit small Word document
3 Edit Excel document
4 Review travel plans on TripAdvisor.com

Figure 4: When working remotely, Microsoft Edge can complete work tasks faster.

Meet Prisha. Prisha is out-of-state for the second time this month on a business trip and needs to work from a coffee shop, accessing her company's network via VPN.

She can't plug in because there's no outlet nearby, and must rely on her laptop battery to meet her needs. Prisha logs into the intranet portal for the Sales team and launches the CRM to log in and begin work for the day. She does some work editing a smaller word document in Word Online, then edits an Excel file in Excel Online. Finally, Prisha checks TripAdvisor® to see if her travel plans for her next business trip are still the most cost-effective.

As Figure 4 shows, Microsoft Edge can help complete common work tasks up to 27 percent faster than Chrome, even if Prisha needs to operate on battery power alone. This means that she can maintain her focus and get back to her hotel quicker than if she were using another browser for remote work.

Another way to look at browser performance

Industry-standard benchmarks test components of systems or applications and provide scores to make comparisons against other systems. We ran four benchmarks while the laptop ran on battery power and when it was plugged into the wall to see if relative browser performance changed when we unplugged from AC power. As Figure 5 shows, Microsoft Edge outperformed Chrome and Firefox on all of these benchmarks when running on battery power.

On the Oort Online benchmark, Microsoft Edge's performance relative to Firefox improved from 115 percent faster on AC to 133 percent faster than Firefox when running on battery. Taken together, these benchmarks show that Microsoft Edge provides better performance on battery. Microsoft Edge recognizes when a laptop is running on battery power and makes sure that performance is optimized.

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Browsing while unplugged

WebXPRT

Edge	321
Chrome	292
Firefox	252

(higher is better)

10% better than Chrome

27% better than Firefox

CanvasMark 2013

Edge	8,583
Chrome	7,500
Firefox	7,571

(higher is better)

14% better than Chrome

13% better than Firefox

Octane 2.0

Edge	25,018
Chrome	24,279
Firefox	21,917

(higher is better)

3% better than Chrome

14% better than Firefox

Oort Online

Edge	5,540
Chrome	5,430
Firefox	2,380
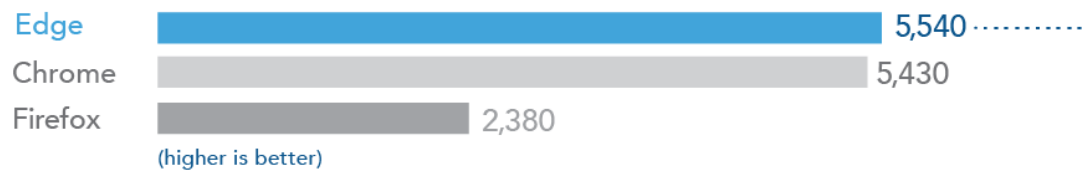
(higher is better)

2% better than Chrome

133% better than Firefox

Figure 5: Microsoft Edge did better on industry-standard web benchmarks than its competitors did while running on battery. (Higher is better.)

	Microsoft Edge	Google Chrome	Mozilla Firefox
WebXPRT	345	316	277
CanvasMark 2013	8,555	8,738	8,583
Octane 2.0	25,232	24,881	22,735
Oort Online	6,270	6,280	2,910

Figure 6: Benchmark scores while plugged into AC power. (Higher is better.)

Commissioned by Microsoft

CONCLUSION

What employees do with their time matters. By making the tools they use to browse the web faster and improving performance when they're not plugged in, you can reduce their frustration and boost productivity.

In our tests, Microsoft Edge outperformed Google Chrome and Mozilla Firefox: it loaded popular websites up to 44 percent faster vs. Chrome and sped up some common work scenarios by a median of 26 percent. Microsoft Edge also performed better in four industry-standard benchmarks while running on battery alone, which means that employees could get work done faster even when they're on the go. As organizations continue to integrate the web into daily tasks, browser speed can give a big boost to productivity.

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 7 provides detailed configuration information for the test system.

System	Dell™ Latitude™ E5450
General	
Number of processor packages	1
Number of cores per processor	2
Number of hardware threads per core	2
Total number of processor threads in system	4
System power management policy	Balanced
Processor power-saving option	Enhanced Intel® SpeedStep® Technology
System dimensions (length × width × height)	13.2 × 9.2 × 1.0 inches
System weight	4.12lbs
CPU	
Vendor	Intel
Name	Core i5
Model number	5200U
Stepping	E0/F0
Socket type	1168 BGA
Core frequency (GHz)	2.2-2.7(Max Turbo)
Bus frequency	DMI2 5 GT/s
L1 cache	2 × 32KB + 2 × 32KB
L2 cache	2 × 256KB
L3 cache	3 MB
Platform	
Vendor and model number	Dell
Motherboard model number	0YDPWM-A00
BIOS name and version	Intel Broadwell-U
BIOS settings	Dell A10 (09/01/2015)
Browser versions	
Microsoft Edge	20.20240.16384.0
Google Chrome	46.0.2490.86
Mozilla Firefox	42.0
Memory module(s)	
Vendor and model number	Hyundai HMT41GS6BFR8A-PB
Type	PC3-12800
Speed (MHz)	1,600
Speed running in the system (MHz)	1,600
Timing/Latency (tCL-tRCD-tRP-tRASmin)	11-11-11-28-208
Size (GB)	8,192
Number of RAM module(s)	1
Total RAM in system (GB)	8
Channel (single/dual)	Single
Operating system	
Name	Microsoft Windows 10 Pro

System	Dell™ Latitude™ E5450
Build number	10.0.10586
Service Pack	N/A
File system	NTFS
Kernel	ACPI x64-based PC
Language	English
Microsoft DirectX version	12
Hard disk	
Vendor and model number	Micron® M510
Number of disks in system	1
Size (GB)	256
Type	SSD
Controller	Intel Mobile Express Chipset SATA RAID
Driver	13.2.0.1016 (6/20/2014)
Graphics	
Vendor and model number	Intel HD Graphics 5500
Type	Integrated
Chipset	Intel HD Graphics Family
BIOS version	1032.17
Total available graphics memory (MB)	1,696
Dedicated video memory (MB)	64
System video memory (MB)	0
Shared system memory (MB)	1,632
Resolution	1,366 × 768
Driver	Intel 10.18.15.4281 (8/143/2015)
Sound card/subsystem	
Vendor and model number	Realtek® High Definition Audio
Driver	Realtek 6.0.1.6075 (6/30/2015)
Ethernet	
Vendor and model number	Intel Ethernet Connection I218-LM
Driver	Intel 12.13.17.4 (8/4/2015)
Wireless	
Vendor and model number	Intel Dual Band Wireless-AC 7265 802.11AC
Driver	Intel 17.15.0.5 (2/22/2015)
USB ports	
Number	3
Type	USB 3.0
Other	SD™ card
Monitor	
LCD type	HD Anti-Glare LCD
Screen size	14in
Refresh rate	60Hz

System	Dell™ Latitude™ E5450
Battery	
Type	RYXXH Lithium-ion
Size (length x width x height)	Integrated
Rated capacity	38Wh
Weight	Integrated

Figure 7: Configuration information for the laptop we used in our tests.

APPENDIX B – HOW WE TESTED

Measuring page load times of the 100 top websites

We timed how long it took each browser to fully load and render each page, reporting the median of three runs. Between each page's launch and timing, we cleared the browser cache to ensure that the site's content loaded from the Internet rather than the local cache. Starting from the desktop GUI:

1. Launch the browser under test (Microsoft Edge, Google Chrome, or Mozilla Firefox).
2. Type the URL of the website to be timed into the address bar.
3. Simultaneously press Go and start the timer.
4. Stop the timer when the web page is fully rendered. Record the result.
5. Open new tab.
6. Close the test site tab.
7. Clear Browsing Data.
8. Close the browser.
9. Repeat steps 1 through 8 for each page load time to be collected.

We also looked at how the websites functioned once loaded, looking for any elements that didn't perform correctly or were missing. We specifically looked at videos, special functions, moving parts, and general site behavior during zooming or scrolling. We noted any issues we found, excluded any that appeared on all of the devices, and calculated a percentage failed by comparing the total sites tested to the number of sites with issues on that device.

We then tested how quickly the browsers refreshed the top 10 websites, using the following steps:

1. Completely load the page.
2. Refresh the page, and time how long it takes the page to load.
3. Repeat that page refresh process two more times.
4. Report the median of those three times.

Testing typical workplace scenarios

We installed Google Chrome and Mozilla Firefox on a laptop running Windows 10 with Microsoft Edge and tested each scenario on the same laptop. We used an Ethernet connection and AC power for Scenario 1 and Scenario 2, and we ran Scenario 3 on battery power and a Wi-Fi® connection. Results represent the median value of three test runs.

Scenario 1: Beginning the work day

1. Simultaneously launch the browser and start the stopwatch.
2. When the address bar appears, stop the stopwatch. Record the time.
3. Navigate to `https://login.microsoftonline.com`
4. Enter your email address and password.
5. Simultaneously click Sign in and start the stopwatch.
6. When the portal page fully loads, stop the stopwatch. Record the time.
7. Simultaneously click the Mail icon and start the stopwatch.
8. When the page fully loads, stop the stopwatch. Record the time.
9. Open the email with the attachment Test1.pptx.
10. Simultaneously click Save to OneDrive and start the stopwatch.

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11. When the green checkmark appears, stop the stopwatch. Record the time.
12. Open a new tab.
13. Type `http://bankofamerica.com` in the address bar.
14. Simultaneously press Enter and start the stopwatch.
15. When the page load icon disappears or the page appears fully loaded (whichever happens second), stop the stopwatch. Record the time.
16. Type `http://forbes.com` in the address bar.
17. Simultaneously press Enter and start the stopwatch.
18. When the page load icon disappears or the page appears fully loaded (whichever happens second), stop the stopwatch. Record the time.
19. Repeat steps 1 through 18 two more times.

Scenario 2: Group collaboration

1. Navigate to `https://login.microsoftonline.com`
2. Enter your email address and password, and click Sign in.
3. Simultaneously click the Delve icon and start the stopwatch.
4. When the page fully loads, stop the stopwatch. Record the time.
5. Navigate to OneDrive.
6. Open the file OfficeTest.docx
7. Click Edit Document.
8. Simultaneously click Edit in Word Online and start the stopwatch.
9. When the document fully loads for editing, stop the stopwatch. Record the time.
10. Click File.
11. Click Save As.
12. Click Save a copy online.
13. Enter a new name for the file.
14. Simultaneously click save and start the stopwatch.
15. When the document fully loads for editing with the new name, stop the stopwatch. Record the time.
16. Open a new tab.
17. Type `http://bbc.com` into the address bar.
18. Simultaneously press Enter and start the stopwatch.
19. When the page load icon disappears or the page appears fully loaded (whichever happens second), stop the stopwatch. Record the time.
20. Repeat steps 1 through 19 two more times.

Scenario 3: Working remotely

1. Unplug the AC power adapter.
2. Unplug the Ethernet cable. Ensure the laptop has successfully connected to the WiFi network.
3. Navigate to `http://sales/PTportal/`
4. Simultaneously click Sugar and start the stopwatch.
5. When the Sugar CRM login page fully loads, stop the stopwatch. Record the time.

6. Navigate to `https://login.microsoftonline.com`
7. Enter your email address and password, and click Sign in.
8. Click OneDrive.
9. Open the file Test1.docx
10. Click Edit Document.
11. Simultaneously click Edit in Word Online and start the stopwatch.
12. When the document fully loads for editing, stop the stopwatch. Record the time.
13. Navigate to OneDrive again.
14. Open the file Test1.xslx
15. Click Edit Document.
16. Simultaneously click Edit in Excel Online and start the stopwatch.
17. When the document fully loads for editing, stop the stopwatch. Record the time.
18. Type `http://tripadvisor.com` into the address bar.
19. Simultaneously press Enter and start the stopwatch.
20. When the page load icon disappears or the page appears fully loaded (whichever happens second), stop the stopwatch. Record the time.
21. Repeat steps 1 through 20 two more times.

Measuring performance with industry-standard benchmarks

We ran each of the following benchmarks three times while plugged into the wall and three times while running on battery. We report the median of the three runs for each set.

WebXPRT 2015
1. Open the web browser under test, and go to www.principledtechnologies.com/benchmarkxprt/webxprt/.
2. Click Run WebXPRT 2015.
3. At the Ready to test your browser screen, click Continue.
4. Click the red "play" icon.
5. When the test completes, record the results.

CanvasMark 2013
1. Open the web browser under test, and go to http://www.kevs3d.co.uk/dev/canvasmark/.
2. To start the test, press the space bar.
3. When the test completes, record the results.

Octane 2.0
1. Open the web browser under test, and go to https://developers.google.com/octane/.
2. Click RUN OCTANE 2.0 NOW!.
3. When the test completes, record the results.

Oort Online benchmark
1. Open the web browser under test, and go to http://oortonline.gl/.
2. Click START TEST.
3. When the test completes, record the results.

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APPENDIX C – DETAILED TEST RESULTS

Figure 8 presents the time (in seconds) it took each browser to load each of the top 100 websites, as identified by Alexa Top Sites 500 on 11/09/15.

Website	Microsoft Edge	Google Chrome	Mozilla Firefox
http://google.com	0.81	1.05	1.14
http://facebook.com	1.16	1.63	2.61
http://amazon.com	2.43	4.06	4.09
http://youtube.com	5.47	4.13	4.37
http://yahoo.com	1.40	2.33	2.22
http://wikipedia.org	0.63	1.34	1.03
http://ebay.com	3.75	4.06	3.66
http://twitter.com	1.85	2.86	2.98
http://reddit.com	1.40	1.98	1.56
http://go.com	1.34	3.06	5.06
http://craigslist.org	1.90	2.41	2.25
http://live.com	1.03	1.88	1.66
http://pinterest.com	1.56	2.56	1.91
http://netflix.com	1.84	2.82	2.72
http://bing.com	0.57	0.85	0.88
http://linkedin.com	1.19	1.62	1.53
http://imgur.com	1.92	2.25	1.62
http://espn.go.com	6.22	5.53	4.97
http://tumblr.com	3.93	4.72	4.37
http://chase.com	2.22	3.13	4.23
http://paypal.com	2.65	3.19	3.06
http://cnn.com	8.53	8.09	7.66
http://instagram.com	1.59	1.97	2.03
http://blogspot.com	1.25	1.57	1.50
http://imdb.com	3.09	4.44	3.34
http://nytimes.com	7.82	7.96	6.61
http://msn.com	6.87	4.09	4.13
http://walmart.com	4.10	7.62	3.72
http://apple.com	1.28	1.81	1.66
http://bankofamerica.com	1.34	3.53	3.61
http://yelp.com	3.47	4.28	3.68
http://huffingtonpost.com	4.09	6.82	5.85
http://diply.com	2.43	2.97	2.44
http://wellsfargo.com	2.19	2.19	2.28
http://target.com	2.84	3.06	3.88
http://weather.com	4.16	6.28	5.69
http://wordpress.com	0.75	1.18	0.97
http://zillow.com	1.84	2.40	2.03
http://buzzfeed.com	3.91	4.78	4.44
http://etsy.com	1.66	3.75	3.19

Website	Microsoft Edge	Google Chrome	Mozilla Firefox
http://aol.com	3.00	4.62	3.52
http://microsoft.com	1.81	2.84	2.63
http://bestbuy.com	2.22	2.66	5.10
http://comcast.net	4.28	5.46	4.47
http://foxnews.com	9.22	7.28	9.06
http://wikia.com	2.44	3.68	3.53
http://homedepot.com	2.46	2.56	3.36
http://microsoftonline.com	1.34	1.47	1.44
http://washingtonpost.com	6.41	5.52	5.88
http://outbrain.com	2.16	3.12	2.46
http://xfinity.com	5.25	5.44	4.56
http://hulu.com	4.53	5.12	4.31
http://usps.com	1.44	2.22	2.65
http://indeed.com	0.90	1.27	1.12
http://groupon.com	2.19	4.19	3.57
http://capitalone.com	2.41	2.81	2.75
http://office.com	1.75	1.81	1.84
http://pandora.com	4.94	4.15	2.63
http://americanexpress.com	0.94	2.04	1.82
http://nfl.com	6.40	7.25	6.38
http://dropbox.com	1.91	3.78	5.69
http://ups.com	0.84	1.56	1.44
http://ask.com	0.84	1.53	1.24
http://att.com	2.44	2.85	2.62
http://usatoday.com	5.85	5.75	6.10
http://forbes.com	1.44	4.03	2.49
http://tripadvisor.com	1.19	2.41	2.59
http://cnet.com	10.81	9.44	7.88
http://dailymail.co.uk	4.29	8.28	9.91
http://verizonwireless.com	1.88	3.66	2.81
http://macys.com	1.90	3.19	2.81
http://baidu.com	2.59	3.50	2.96
http://adobe.com	4.12	5.63	3.97
http://gfycat.com	2.63	2.11	2.19
http://kohls.com	2.56	4.09	3.68
http://ijreview.com	0.94	1.47	2.13
http://about.com	1.72	2.10	1.97
http://fedex.com	1.10	1.72	1.41
http://stackoverflow.com	1.00	1.22	1.00
http://answers.com	2.19	2.47	2.22
http://slickdeals.net	7.78	9.83	9.21
http://twitch.tv	2.10	4.47	3.68
http://vice.com	9.58	7.85	7.09
http://aws.amazon.com	2.81	3.11	3.59

Website	Microsoft Edge	Google Chrome	Mozilla Firefox
http://nih.gov	1.06	1.69	1.34
http://webmd.com	2.01	2.57	2.47
http://citi.com	2.32	2.53	2.47
http://lowes.com	2.16	3.42	2.56
http://businessinsider.com	3.69	6.19	4.91
http://cbssports.com	2.31	5.44	4.43
http://salesforce.com	2.69	3.40	3.18
http://bbc.com	2.16	5.78	4.99
http://bleacherreport.com	5.90	6.19	5.75
http://newegg.com	3.78	4.97	3.98
http://gap.com	2.13	5.00	3.19
http://github.com	1.19	1.26	1.31
http://wsj.com	5.13	5.88	5.16
http://costco.com	1.78	2.26	1.47
http://discovercard.com	1.50	3.10	2.31
http://Nordstrom.com	2.71	3.28	2.88
TOTAL	**291.6**	**370.8**	**342.8**

Figure 8: Time, in seconds, to load the top 100 websites using each browser.

Figure 9 presents the time (in seconds) it took each browser to refresh the 25 websites we selected from the Alexa top 100 sites.

Website	Microsoft Edge	Google Chrome	Mozilla Firefox
http://google.com	0.68	0.75	0.81
http://facebook.com	0.94	0.93	0.94
http://amazon.com	2.56	3.00	3.35
http://youtube.com	3.44	2.47	2.50
http://yahoo.com	2.18	2.40	2.67
http://ebay.com	3.09	3.28	3.84
http://wikipedia.org	0.34	0.37	0.44
http://twitter.com	1.78	1.97	2.13
http://craisgslist.org	1.25	0.94	1.06
http://reddit.com	0.90	1.25	1.12
http://linkedin.com	0.69	0.87	0.78
http://tumblr.com	2.75	3.47	3.47
http://chase.com	2.12	2.44	2.97
http://imdb.com	2.03	2.25	2.84
http://huffingtonpost.com	3.22	3.48	3.94
http://zillow.com	1.28	1.16	1.47
http://microsoft.com	1.69	2.03	2.11
http://aol.com	4.19	3.34	4.22
http://wikia.com	1.79	1.85	2.34
http://xfinity.com	4.10	3.15	3.40
http://capitalone.com	2.09	1.44	2.00
http://pandora.com	6.69	3.37	5.47

Website	Microsoft Edge	Google Chrome	Mozilla Firefox
http://cnet.com	7.50	5.94	6.56
http://dropbox.com	2.15	2.06	2.16
http://about.com	2.53	2.37	2.88
TOTAL	**61.98**	**56.58**	**65.47**

Figure 9: Median refresh page load times for the top 10 websites plus 15 other random websites from the top 100.

ABOUT PRINCIPLED TECHNOLOGIES

Principled
Technologies®

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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.