

# EXTENDING BATTERY LIFE WITH MICROSOFT EDGE

If you travel for business, work at a nearby coffee shop, or even spend time navigating your office's conference rooms, you know the importance of battery life. It's not always possible to plug into an outlet, and you need to consider what may be a drain on your battery. It is common practice to keep a browser open much of the time, often with multiple tabs open. How does your browser affect battery life? Today, browsers can recognize when a laptop is running on battery power and employ power-saving measures automatically so you can stay unplugged longer.

Microsoft commissioned Principled Technologies to compare Microsoft Edge to two other popular browsers—Google Chrome and Mozilla Firefox—to see how each affected battery life. While your battery life mileage may vary, using Microsoft Edge our laptop lasted up to 48 percent longer when surfing the web—nearly an hour and a half longer than when using Firefox. Compared to Firefox, Microsoft Edge allowed us to stream videos up to 25 percent longer and provided up to 13 percent longer battery life when collaborating on Skype. It also performed comparably to Chrome and Firefox when streaming music on Pandora.

This means that using Microsoft Edge could let you stay at that coffee shop a little—or a lot—longer before you're forced to retreat to the office. With extended battery life, you can work on your own terms: where and when you want, without worry.



## STAY IN CHARGE WITH MICROSOFT EDGE

It can be a real hassle to find a place to plug in your laptop when you're on the go. Anything that lets you put off plugging into an outlet can improve your workday. Browsers, which have become a big part of workers' digital lives, affect how long laptop batteries last. Workers use browsers for researching things on the web, accessing email, streaming video, and even video conferencing. Completing these tasks throughout the day has a real effect on battery longevity. With this in mind, we compared the battery life of a laptop using Microsoft Edge, Google Chrome, and Mozilla Firefox to complete these kinds of tasks.

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](#).

### Web browsing with multiple tabs open

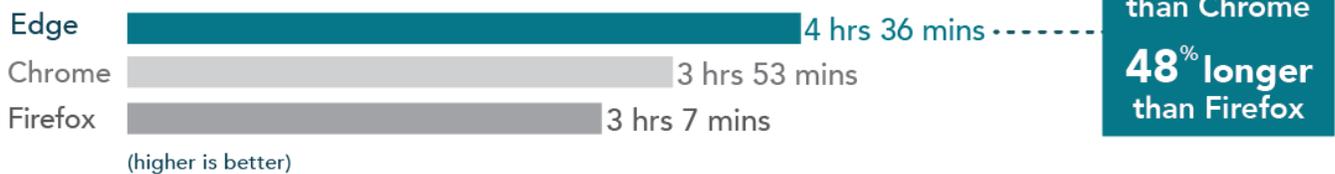


Figure 1: Using Microsoft Edge extended battery life by up to 48 percent over Firefox when browsing multiple tabs.

When browsing, it's rare to have a single tab open. Work requires you to multi-task, looking at websites, keeping mail open, etc. As Figure 1 shows, using Microsoft Edge provided the longest battery life of the three browsers when browsing the web with multiple open tabs. And we're not talking small improvements: the Microsoft Edge browser provided a median of 43 additional minutes of battery life compared to Chrome and an additional 1 hour 29 minutes of battery life compared to Firefox. If your common tasks involve a lot of web browsing, using Microsoft Edge could help you reclaim a significant amount of battery life and make your travels less stressful.

## Video streaming

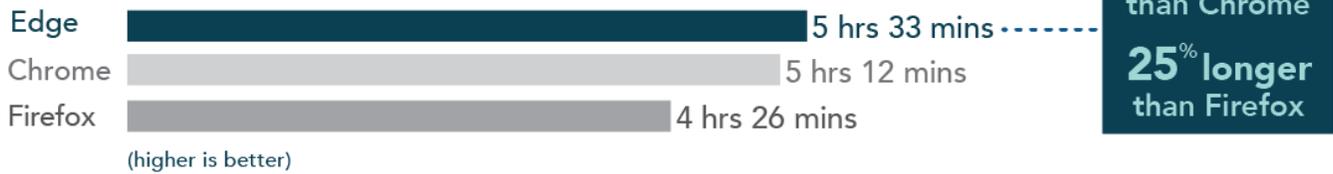


Figure 2: Using Microsoft Edge extended battery life by up to 25 percent over Firefox when streaming video.

You've decided to finally watch that movie while flying from New York to LA to meet with clients. Will your battery last the flight while streaming video? Our tests showed that Microsoft Edge could help ensure that you're able to finish what you're watching without plugging in. As Figure 2 shows, Microsoft Edge provided up to 25 percent longer battery life than Firefox when streaming video. Battery life improved by 21 minutes vs. Chrome and 1 hour 7 minutes vs. Firefox. This means that using Microsoft Edge can lessen the impact on battery of even taxing tasks like video streaming, which can be crucial to on-the-go workers who stream video.

## Video conferencing



Figure 3: Using Microsoft Edge extended battery life by up to 13 percent over Firefox when participating in a video conference on Skype.

Being out of the office doesn't exempt you from collaborating with your colleagues. What could be worse than having your battery die while you're using Skype to lead a video conference with several coworkers and clients? Video conferencing uses a lot of resources, which drains battery faster than tasks like web browsing. But your browser of choice can still extend battery life in these situations.

As Figure 3 shows, Microsoft Edge provided up to 13 percent longer battery life than Firefox during video conferencing using Skype. Microsoft Edge was comparable in

battery life to Chrome while video conferencing on Skype, but added a significant 23 minutes to battery life compared to Firefox. This shows that using Microsoft Edge could help lengthen battery life on even the most intensive-tasks, helping you stay connected to your call for longer and letting you do more.

## Music streaming



Figure 4: Using Microsoft Edge provided long battery life, 3 percent shorter than Chrome and 1 percent longer than Firefox, when streaming music.

Headphones are a traveler’s best friend, and popular music streaming services such as Pandora can give your work a boost when you’re trying to focus. Again, users access these services through the all-important browser.

As Figure 4 shows, Microsoft Edge enabled long battery life while streaming music, lasting for 6 hours 21 minutes. This was comparable, but slightly shorter battery life compared to streaming music with Chrome. Microsoft Edge was comparable streaming music to Firefox, adding an extra 2 minutes in our tests. This shows that while improving battery life on other tasks Microsoft Edge can also keep battery life strong when streaming music to help you block out the noise of bustling airports and cafes.

## CONCLUSION

Keep that battery warning at bay when you’re working away from your desk by using the browser that helps maximize battery life. In our tests, Microsoft Edge extended battery life by as much as 48 percent compared to Firefox. When browsing the web, Microsoft Edge enabled an extra hour and a half of battery life compared to Firefox. That’s nearly a quarter of a typical workday, which can be a huge deal for travelers.

When completing other common tasks, video streaming and web conferencing, Microsoft Edge improved battery life by up to 25 and 13 percent over Firefox, respectively. Microsoft Edge also delivered long battery life streaming music, comparable to its competitors.

Stop worrying about plugging in. If you’re looking for a way to extend your laptop battery and delay the struggle that comes with finding an outlet on the road, choosing Microsoft Edge browser can help.

## APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 5 provides detailed configuration information for the test system.

System	Dell™ Latitude™ E5450
<b>General</b>	
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 x width x height)	13.2 x 9.2 x 1.0 inches
System weight	4.12lbs
<b>CPU</b>	
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 x 32KB + 2 x 32KB
L2 cache	2 x 256KB
L3 cache	3 MB
<b>Platform</b>	
Vendor and model number	Dell
Motherboard model number	OYDPWM-A00
BIOS name and version	Intel Broadwell-U
BIOS settings	Dell A10 (09/01/2015)
<b>Browser versions</b>	
Microsoft Edge	20.20240.16384.0
Google Chrome	46.0.2490.86
Mozilla Firefox	42.0
<b>Memory module(s)</b>	
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
<b>Operating system</b>	
Name	Microsoft Windows® 10 Pro

<b>System</b>	<b>Dell™ Latitude™ E5450</b>
Build number	10.0.10586
Service Pack	N/A
File system	NTFS
Kernel	ACPI x64-based PC
Language	English
Microsoft DirectX version	12
<b>Hard disk</b>	
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)
<b>Graphics</b>	
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 x 768
Driver	Intel 10.18.15.4281 (8/143/2015)
<b>Sound card/subsystem</b>	
Vendor and model number	Realtek High Definition Audio
Driver	Realtek 6.0.1.6075 (6/30/2015)
<b>Ethernet</b>	
Vendor and model number	Intel Ethernet Connection I218-LM
Driver	Intel 12.13.17.4 (8/4/2015)
<b>Wireless</b>	
Vendor and model number	Intel Dual Band Wireless-AC 7265 802.11AC
Driver	Intel 17.15.0.5 (2/22/2015)
<b>USB ports</b>	
Number	3
Type	USB 3.0
Other	SD card
<b>Monitor</b>	
LCD type	HD Anti-Glare LCD
Screen size	14in
Refresh rate	60Hz

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

Figure 5: Configuration information for the laptop we used in our tests.

## APPENDIX B – HOW WE TESTED

We ran each test three times and report the median result of the three runs.

### Browsing with multiple open tabs

#### Running the test

1. Open the browser under test on the system under test and navigate to <http://twitch.tv/>
2. Open a new tab and navigate to <http://gfycat.com/>
3. Open a new tab and navigate to <http://www.msn.com/>
4. Open a new tab and navigate to [http://www.xfinity.com/corporate/shop/productoverview.html?CMP=KNC-IQ\\_ID\\_61300293-VQ2-{network}-VQ3--VQ6-10491613345-VQ16-c-pkw-xfinity-pmt-e&iq\\_id=61300293](http://www.xfinity.com/corporate/shop/productoverview.html?CMP=KNC-IQ_ID_61300293-VQ2-{network}-VQ3--VQ6-10491613345-VQ16-c-pkw-xfinity-pmt-e&iq_id=61300293)
5. Open a new tab and navigate to <http://www.nfl.com/>
6. Select the first tab so that <http://twitch.tv/> is the visible page and prepare the stopwatch.
7. Simultaneously start the stopwatch and unplug the system under test.
8. When the system under test shuts down, stop the stopwatch, and record the results.

### Streaming video

#### Setting up the test

1. Create a paid “4 Screens + Ultra HD” Netflix account.

#### Running the test

1. Open the browser under test on the system under test and navigate to <https://www.netflix.com/?locale=en-US>
2. Log into Netflix.
3. Click Search and type *friends*
4. Click on the Friends icon.
5. Select Episodes and prepare the stopwatch.
6. Select episode One.
7. As soon as the episode begins to play, simultaneously start the stopwatch and unplug the system under test.
8. When the system under test shuts down, stop the stopwatch, and record the results.

### Web conferencing with Skype

#### Setting up the test

1. On a secondary laptop, download and install the Skype desktop program found here: <http://www.skype.com/en/download-skype/skype-for-computer/>
2. On a third laptop, place the video file (Skype\_Intermediate.mp4).

#### Running the test

1. Open the Skype desktop app and log in on a secondary computer.
2. Open the web browser under test on the system under test, and go to [https://login.skype.com/login?client\\_id=578134&redirect\\_uri=https%3A%2F%2Fweb.skype.com%2F](https://login.skype.com/login?client_id=578134&redirect_uri=https%3A%2F%2Fweb.skype.com%2F)
3. On the secondary computer, make a video conference call to the system under test.
4. On the system under test, accept the Conference call.
5. On the third system, start the video with Windows Media Player.
6. Select the replay video button.
7. Face the secondary system so that its webcam is recording the audio and visual of the third system and transmitting it over Skype to the system under test.
8. Simultaneously start the stopwatch and unplug the system under test.
9. When the system under test shuts down, stop the stopwatch, and record the results.

## Streaming audio

### Setting up the test

1. Create a paid Pandora One account.
2. Create a Classical radio station.

### Running the test

1. Open the browser under test on the system under test and navigate to <http://www.pandora.com/>
2. Log into Pandora.
3. Select the Classical Radio station.
4. Simultaneously start the stopwatch and unplug the system under test.
5. When the system under test shuts down, stop the stopwatch, and record the results.

## ABOUT PRINCIPLED TECHNOLOGIES



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