

Lower bandwidth consumption and less waiting with Dropbox Business

Dropbox Business performed large file downloads, uploads, and peer-to-peer sharing faster than tested competitors

Moving from an onsite file-sharing solution to a cloud-based service can reduce wait times and improve productivity. But with so many to choose from, how do you know you're picking the best option? Implementing the right solution could mean fewer workflow interruptions and increased productivity for your employees.

In our tests, Dropbox Business consumed less bandwidth when sharing large files compared to Microsoft® OneDrive® for Business, Box Business, and Google Drive™. Dropbox also performed large file uploads, downloads, and sharing faster than those competitors.

High bandwidth consumption and long wait times for downloading, uploading, or sharing large files can leave your team waiting while a deadline looms. This diminishes productivity, hurts employee collaboration, and delays project completion. You can save precious time and reduce these headaches with Dropbox.



Up to
65%
lower bandwidth
consumption



Up to
32X
faster downloads



Up to
5X
faster uploads

Finish projects faster

If your employees routinely download, upload, and share large files like videos or disk images, they know how unproductive it is to have to wait for those tasks to complete. They may spend precious work time idle, handcuffed by the speed of their current file transfer method. Completing these tasks faster can alleviate this problem and prevent unnecessary interruptions in your employees' workflow. Preventing those interruptions allows them to stay on task, avoid distractions, and complete projects faster. In addition, lower bandwidth consumption when sharing large files helps avoid interruptions for others working on the same Internet connection.

What we found

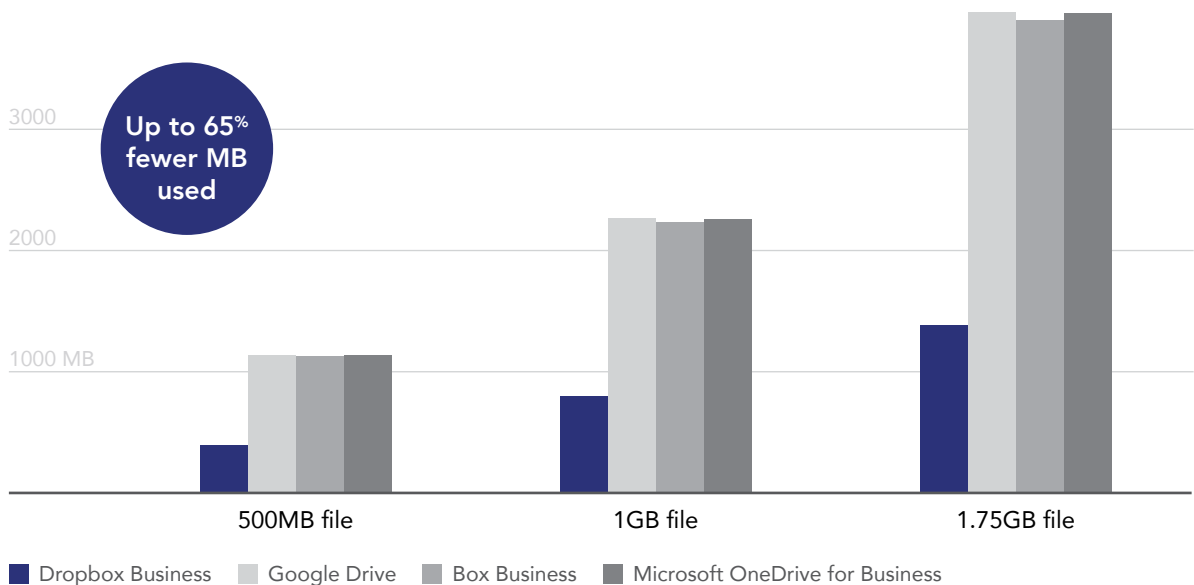
Lower bandwidth consumption while sharing

In our tests, Dropbox Business used less bandwidth for large file sharing. Lower bandwidth consumption can improve the experience of others using the same network.



Bandwidth used when sharing large files (MB transferred)

Lower is better

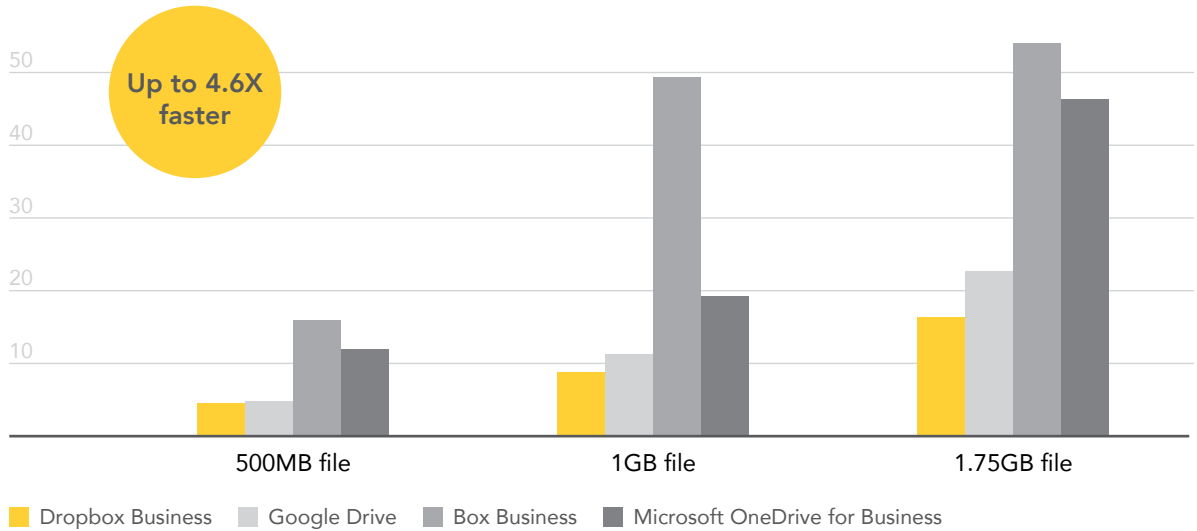


Faster sharing

Along with using less bandwidth, Dropbox Business shared large files faster than the competitors did.



Time to share large files (minutes)
Lower is better

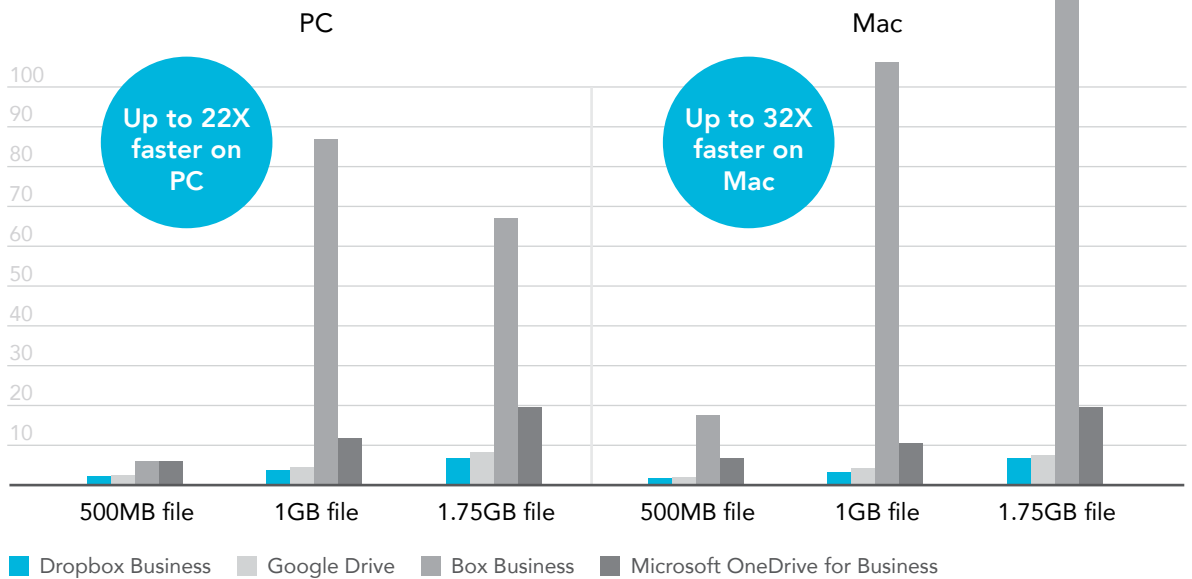


Faster downloads

Dropbox Business downloaded the same three large files faster than all three competitors. The chart below shows the wins for Dropbox Business on both PC and Mac laptops.



Time to download large files (minutes)
Lower is better



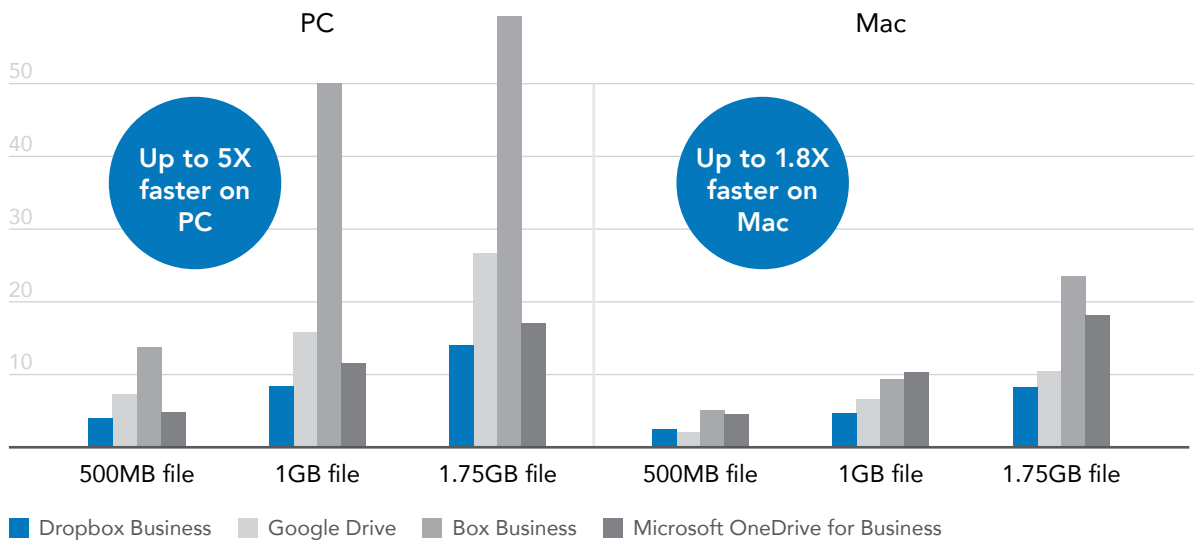
Faster uploads

Dropbox Business also uploaded the same three large files faster than the competition in almost every instance. The chart below again shows those wins.



Time to upload large files (minutes)

Lower is better



Conclusion

Dealing with large files efficiently is a necessity for every business. Choosing a cloud-based file-hosting service that allows your employees to upload, download, and share large files with less lag time means they can get back to their projects sooner and stay productive. Lower bandwidth consumption during large file sharing also helps prevent lost productivity or workflow interruptions. To regain valuable work time and reduce the workflow hassles that come from transferring large files, consider Dropbox Business for your cloud-based file-hosting needs.

On May 11, 2016, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on June 28, 2016.

Appendix A – System configuration information

System	HP ProBook 430	Apple® MacBook Air®
Screen size (inches)	13.3	13.3
Display resolution	1,366 × 768	1,440 × 900
PPI	118	127.68
Dimensions – length × width × height (inches)	12-7/8 × 9-1/4 × 3/4	12-3/4 × 9 × 1/2
Weight (lbs.)	3.40	2.90
CPU	Intel® Core™ i3-4010U 1.7 GHz	Intel Core i5-4260U 1.4 GHz
Storage	Samsung® 128GB SSD	Apple 256GB SSD
OS	Windows® 7 Professional SP1	Apple OS X® 10.11.4

Appendix B - How we tested

As the table below shows, we tested four identical models of an HP ProBook 430 running Windows 7 and four identical models of an Apple MacBook Air running OS X. We installed one file-storage service client on each device.

HP ProBook 430	
Device number	File-hosting service
1	Dropbox Business
2	Google Drive
3	Microsoft OneDrive for Business
4	Box Business

Apple MacBook Air	
Device number	File-hosting service
1	Dropbox Business
2	Google Drive
3	Microsoft OneDrive for Business
4	Box Business

We performed each test sequentially for each service and device at approximately the same time of day in Durham, North Carolina. We used a 100Mbit business-class symmetric internet connection. To avoid possible bandwidth conflicts among applications, only the device under test was connected to the network. We used a stopwatch to record the time it took each file-hosting service to download, upload, and perform end-to-end synchronization of files of each size, respectively. For each task on each service, we started the stopwatch as explained in the methodologies, and stopped the stopwatch when we observed the following indicators (all indicators were the same for downloads, uploads, and end-to-end synchronizing):

- Dropbox Business: The blue arrow became a green checkbox.
- Google Drive: The icon stopped pulsing.
- OneDrive for Business: The animated bar below the cloud disappeared.
- Box Business: The orange arrow became a blue checkbox.

We also collected network traffic data using WireShark 2.0.4, available at <https://www.wireshark.org>. We used a dedicated desktop PC running Windows 10 for this purpose. The configuration ensured that we collected all traffic bound to and from the internet. In addition to packet capturing capabilities, Wireshark provides advanced packet analysis and filtering features.

Setting up the test

1. Create the large single test file for each run (500MB, 1GB, and 1.75GB) using the `make_rnd_file.sh` bash shell script:

```
#!/bin/bash
# create a file (named arg 1) of size (arg 2) n KBytes filled with random data

# usage  make_rnd_file.sh file.txt 10

if [ $# -ne 2 ] ; then
echo "usage: $0 file.txt size_in_kb"
exit 1
fi

file=$1
size=$2

echo "Creating file $file of size $size kB"

dd if=/dev/urandom of="$file" count="$size" bs=1024

# check for error?

ls -lh "$file"
echo Done
```

2. Open a web browser.
3. Navigate to www.dropbox.com, and create a Dropbox Business account.
4. Navigate to drive.google.com, and create a Google Drive account.
5. Navigate to onedrive.live.com/about/en-us/, and create a OneDrive for Business account.
6. Navigate to www.box.com/, and create a Box Business account.
7. Place the test files into the Documents folder on each laptop.

Running the test

Sharing a large test file (500MB, 1GB, 1.75GB)

1. Open the desktop app of the storage solution under test on both the MacBook Air and the HP ProBook. Ensure both machines reside in the same LAN address space.
2. On the MacBook Air, navigate to the Documents folder, and prepare the stopwatch. Prepare WireShark for packet capture.
3. Right-click the large file, and click Copy.
4. Navigate to the desktop sync folder for the storage solution under test.
5. Right-click the desktop sync folder for the storage solution under test, and simultaneously click Paste and start the stopwatch. Start the WireShark packet capture.
6. Switch to the HP ProBook that you set up in step 1.
7. When the large test file has completely synchronized and shows up in the sync folder as synchronized on the HP Probook, stop the stopwatch, and stop the WireShark packet capture.
8. Record the result for each file size.

Downloading a large test file (500MB, 1GB, 1.75GB)

Note: This requires large test files to already be uploaded to the cloud storage solution under test via the web UI on a separate machine, to ensure that no file caching occurs.

1. Open a web browser, and navigate to the web interface of the storage solution under test.
2. Prepare the stopwatch, and prepare WireShark for packet capture.
3. In the web interface of the storage solution under test, simultaneously start the stopwatch and the WireShark packet capture.

4. For Dropbox Business, OneDrive for Business, and Google Drive, move the test file to a folder being synced by the desktop client. For Box Business, select the folder that contains the large test file, and click Properties > Sync to Computer.
5. When the file has completely downloaded, stop the stopwatch, and stop the WireShark packet capture.
6. Record the result for each file size.

Uploading a large test file (500MB, 1GB, 1.75GB)

1. Navigate to the Documents folder, and prepare the stopwatch. Prepare WireShark for packet capture.
2. Right-click the large test file, and click Copy.
3. Navigate to the desktop sync folder for the storage solution under test.
4. Right-click the desktop sync folder for the storage solution under test. Simultaneously click Paste, start the stopwatch, and start the WireShark packet capture.
5. When the file has completely uploaded, stop the stopwatch, and stop the WireShark packet capture.
6. Record the result for each file size.

Repeating the tests

1. Once you have completed each test, reboot the systems, and repeat the tests two more times with a new set of files.

Appendix C - Detailed test results

Each time or bandwidth statistic we report is taken from the average of three test runs.

Lower bandwidth consumption while sharing

Bandwidth used when sharing large files (MB transferred)

	Dropbox Business	Google Drive	Box Business	Microsoft OneDrive for Business
End-to-end single large file (500 MB)	395.9	1,131.9	1,126.9	1,133.2
End-to-end single large file (1 GB)	793.6	2,265.0	2,233.8	2,254.7
End-to-end single large file (1.75 GB)	1,379.5	3,964.5	3,895.7	3,952.5

Faster sharing

Time to share large files (minutes:seconds.milliseconds)

	Dropbox Business	Google Drive	Box Business	Microsoft OneDrive for Business
End-to-end single large file (500 MB)	04:31.59	04:48.76	15:52.34	11:53.04
End-to-end single large file (1 GB)	08:46.54	11:17.67	49:22.00	19:11.69
End-to-end single large file (1.75 GB)	16:23.14	22:40.88	53:57.33	46:15.33

Faster downloads

Time to download large files (minutes:seconds.milliseconds)

	Dropbox Business	Google Drive	Box Business	Microsoft OneDrive for Business
PC results				
Single large file download (500 MB)	02:14.50	02:26.17	06:00.60	06:02.48
Single large file download (1 GB)	03:42.99	04:28.00	86:51.67	11:50.39
Single large file download (1.75 GB)	06:47.59	08:05.46	66:53.00	19:30.49
Mac results				
Single large file download (500 MB)	01:43.41	02:02.51	17:27.64	06:45.47
Single large file download (1 GB)	03:10.28	04:14.14	106:09.67	10:24.62
Single large file download (1.75 GB)	06:48.43	07:30.50	138:44.67	19:25.22

Time to upload large files (minutes:seconds.milliseconds)

	Dropbox Business	Google Drive	Box Business	Microsoft OneDrive for Business
PC results				
Single large file upload (500 MB)	04:02.74	07:15.87	13:47.05	04:45.78
Single large file upload (1 GB)	08:19.72	15:45.57	50:00.00	11:34.25
Single large file upload (1.75 GB)	14:02.68	26:39.55	59:12.33	17:01.41
Mac results				
Single large file upload (500 MB)	02:31.99	02:07.28	05:08.30	04:31.53
Single large file upload (1 GB)	04:44.67	06:35.12	09:19.70	10:16.35
Single large file upload (1.75 GB)	08:16.77	10:26.59	23:33.18	18:07.96

This project was commissioned by Dropbox.



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