



A cloud abroad in Paris

A comparison of Google Docs and Microsoft Word Online

Today's worldwide marketplace demands that you set up offices wherever the action is. Storing information in the cloud makes it convenient for teams everywhere to access those files. But having your headquarters in one country and offices in another can affect timely collaboration—so it's essential to use a tool that lets teammates work together efficiently no matter where they are.

G Suite and Microsoft® Office 365® both include real-time editing capabilities—Google Docs™ and Microsoft Word Online respectively. This report provides users with real-world data about real-time collaboration when the cloud tenant is established in the U.S. and offices across the pond use these shared resources.

We set up G Suite and Microsoft Office 365 accounts in the U.S. and our team in France conducted hands-on tests to determine whether Google Docs or Microsoft Word Online provided the superior experience.

Google Docs provided a faster collaboration experience than Microsoft Word Online and was 100 percent error-free in our tests. Read on to learn more.

See
**REAL-TIME
CHANGES**
in up to
98%
LESS TIME
with Google Docs



What does “real time” really mean?

We conducted a series of hands-on tests using laptops and smartphones running multiple operating systems (OS), browsers, and apps. Through our tests, we found that collaborating with Microsoft Word Online was slower than with Google Docs overall. Word Online also had problems with functionality, forcing us to copy changes and refresh the page to try (and fail) again when inserting large amounts of text. This situation is less than ideal when your primary means of team collaboration is through these products.

Before we started testing in France, we set up accounts in G Suite and Microsoft Office 365 at our hands-on testing facility in Durham, North Carolina. We used those accounts for testing in the United States. Then, our team in Paris used those same accounts for testing in France.

Read PT’s five-part series [“Not all clouds are created equal”](#) to see how G Suite and Microsoft Office 365 handled collaboration and productivity tasks in the U.S.

The following scenarios describe the results of our testing in Paris, with a hypothetical headquarters in the United States. These scenarios give us a glimpse into how G Suite and Office 365 perform for employees that travel or who work outside of their U.S. headquarters.



More time to edit on the go

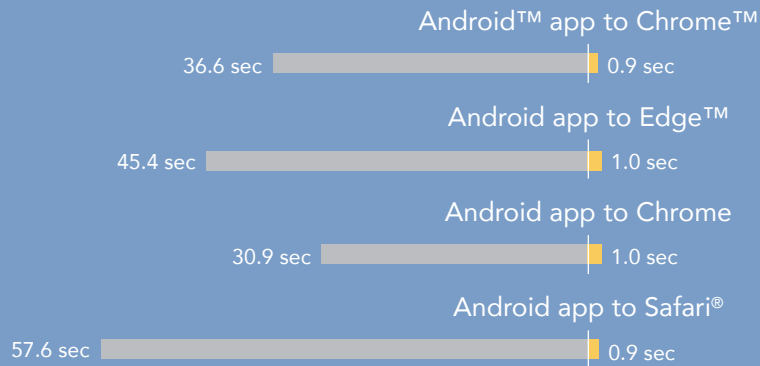
Sasha, a Foreign Service Officer, is in Paris helping the new U.S. diplomat to France settle into her new job. She spends most of her day coordinating staff, checking guest lists for various events, and creating a “Discover France” brochure for American visitors. She uses Google Docs on her phone to share documents with her Parisian coworkers via email.

The data shows that when Sasha inserts a paragraph of text using Google Docs on her phone, her team can see this edit in about a second. If this office were using Word Online, that edit wouldn't appear for about a minute. That's a long time to wait for an update. And using Google Docs means they see any picture under 25 MB that she adds almost a minute sooner with Google Docs compared to Word Online. These pictures could be the size of an average smartphone photo or a high-res image suitable for the brochure.

Display an inserted paragraph up to

56
seconds
sooner

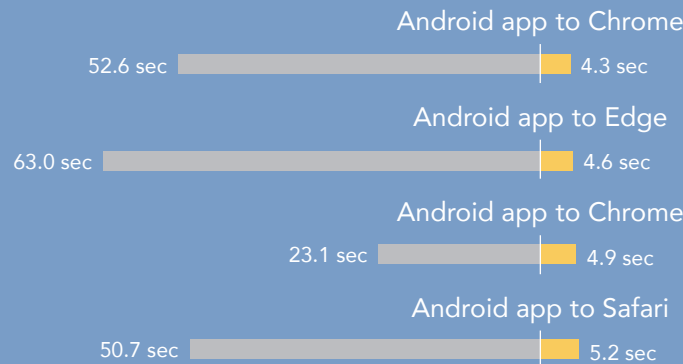
with Google Docs



Display an inserted 2MB image up to

58
seconds
sooner

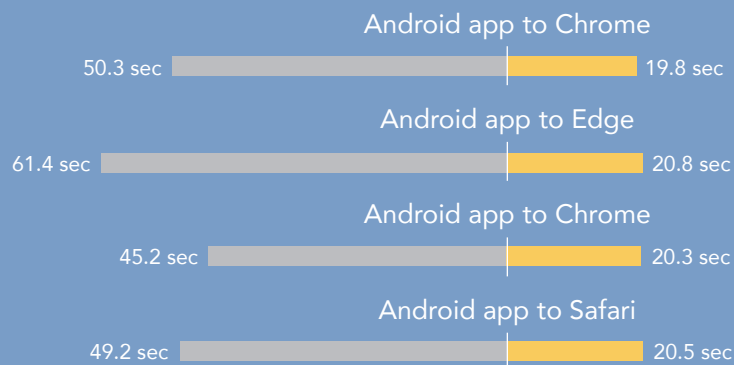
with Google Docs



Display an inserted 22MB image up to

40
seconds
sooner

with Google Docs



■ Word Online ■ Google Docs

Keep projects moving

Yolanda is the Paris consultant for an international design firm based in the U.S. She's the lead sales contact for prospective clients in France. She also works with other teams in the Paris office to help them get their projects and proposals out the door. Everyone she collaborates with in this branch uses Google Docs routinely as part of G Suite.

As soon as Yolanda's colleagues grant her edit rights to their documents, she can start using the editing capabilities of Google Docs on her laptop in real time. She inserts text and images into the doc, where team members for each project can then access and coedit the doc.

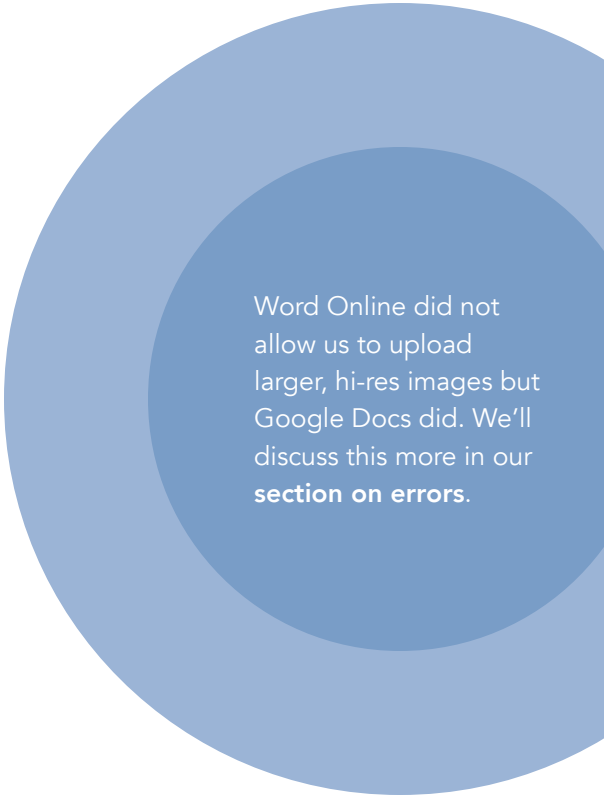
As our testing shows, Google Docs saves Yolanda and her colleagues frustrating delays and edit conflicts over the course of many rounds of edits.

When Yolanda inserts a 2MB image (about the size of an average smartphone photo) into a Google Doc, a team member sees it sooner on their own laptop—up to 24 percent sooner than if they were using Word Online. This was the case in all of the four OS/browser combinations we tested.

When Yolanda inserts 100 KB of text (roughly 50 pages), Google Docs takes up to 68 percent less time to display that text on a collaborator's laptop.

In our testing, these tasks not only generally took longer with Word Online—completing some tasks was impossible.

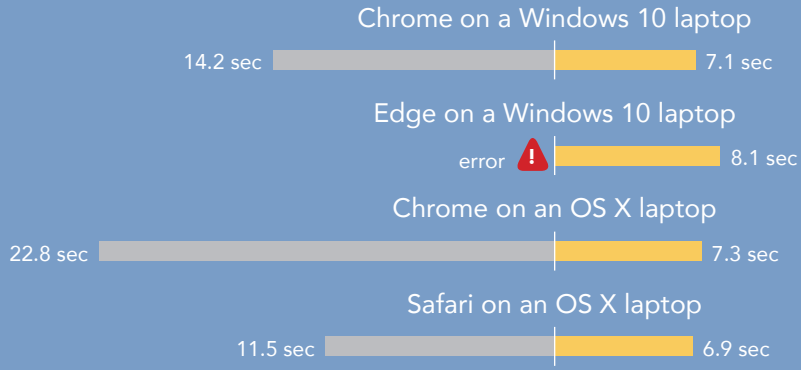
Results on the next page also show that teams using Word Online would be able to insert large blocks of text into documents *only* if they were using a Google Chrome browser on Windows® 10 and OS X® laptops. But any team member using the Microsoft Edge browser on a Windows 10 notebook would encounter problems pasting 100 KB of text to a Word Online file.² As you'll see on page 6, Word Online ran into problems inserting large images across all platforms as well.



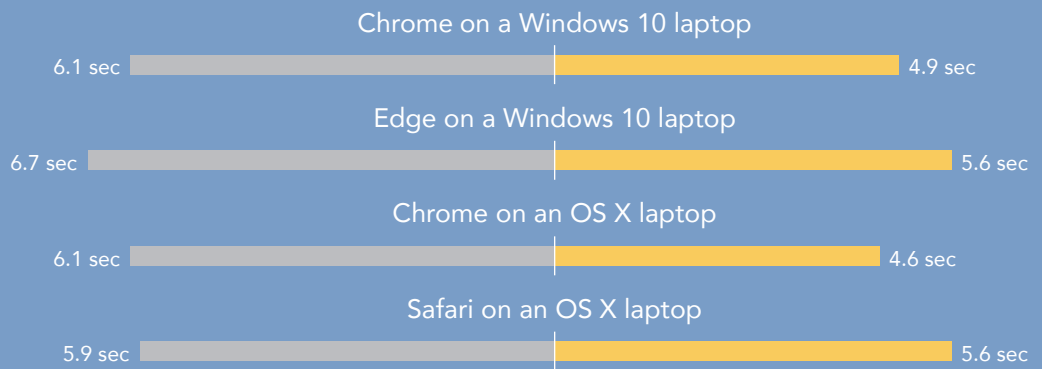
Word Online did not allow us to upload larger, hi-res images but Google Docs did. We'll discuss this more in our **section on errors**.

When you're waiting for a colleague's changes to appear in a document you're both editing simultaneously, even small delays increase the likelihood of editing conflicts and frustration. Seeing each other's edits more quickly with Google Docs helps avoid that and makes the collaboration process smooth and convenient.

Display 100 KB of inserted text in up to **68% less time** with Google Docs



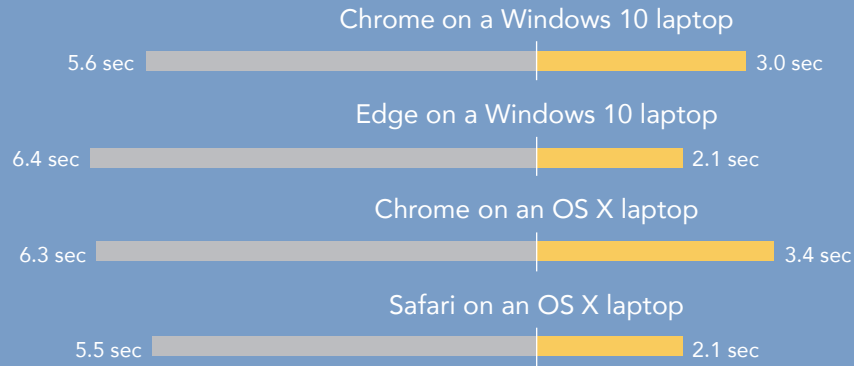
Display an inserted 2MB image in up to **24% less time** with Google Docs



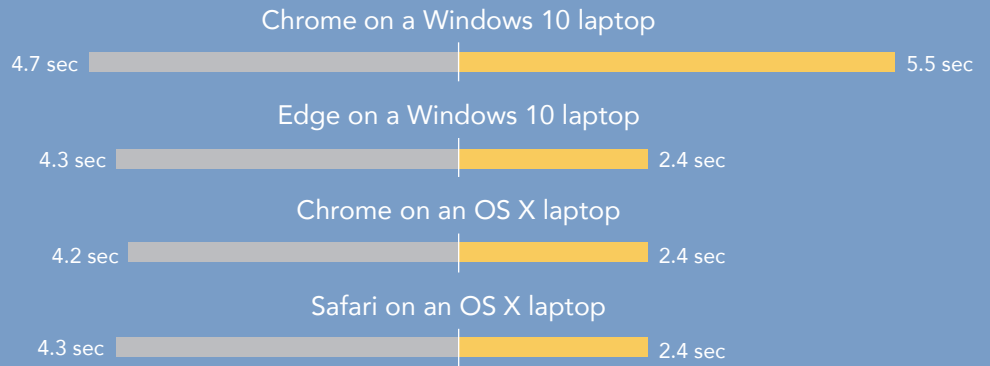
■ Word Online ■ Google Docs

Once Yolanda gets the go-ahead from a new client, she kicks off the project by creating and sharing the new contract with her team members via email. As the data shows, Yolanda can complete these two tasks more quickly with Google Docs in almost every configuration than with Word Online, which would take up to 6 seconds longer to complete both tasks. That might not seem like much time, but when you're collaborating with colleagues on multiple projects and documents on a daily basis, the time saved really adds up—and in the case of Word Online, so does the frustration at the product not working as smoothly as expected.

Create a new document in up to **67%** less time with Google Docs



Share a document via email in up to **44%** less time with Google Docs











■ Word Online ■ Google Docs

Error-free: Avoid roadblocks on the collaboration journey









When collaborating with colleagues, functionality is as crucial as speed. As we mentioned earlier, our testing revealed a number of tasks that Google Docs could handle in Paris but Word Online could not.

The data below shows that with all four OS/browser combinations that we tested, Google Docs let us insert very large amounts of text and large images, while Word Online did not.









Insert 500 KB of text

	Word Online	Google Docs
Chrome on Windows 10 laptops		
Edge on Windows 10 laptops		
Chrome on OS X laptops		
Safari on OS X laptops		

Insert 1 MB of text

	Word Online	Google Docs
Chrome on Windows 10 laptops		
Edge on Windows 10 laptops		
Chrome on OS X laptops		
Safari on OS X laptops		

Insert a 22MB image

	Word Online	Google Docs
Chrome on Windows 10 laptops		
Edge on Windows 10 laptops		
Chrome on OS X laptops		
Safari on OS X laptops		

Conclusion: Google Docs makes collaboration easier

A cloud with built-in productivity tools is a convenient way for multinational companies to share resources—especially when a team in one country sets up the account and teams in other countries aren't penalized with longer wait times because of it.

When you're collaborating in real time on a document, minor lags of even a couple seconds are noticeable and can cause problems. Delays not only frustrate and annoy everyone involved, they may tempt users to abandon coediting entirely. Going back to emailing the file around makes it harder to keep track of changes.

Google Docs made collaboration a smooth and seamless experience, with changes one user made showing up very quickly for a second user. Google Docs also experienced no functionality issues in our hands-on testing.

Collaborating with Microsoft Word Online was more difficult, with wait times up to 61 times as long as Google Docs—totaling almost a full minute of waiting. There were situations where Word Online couldn't handle the amount of text or the size of the images we used, producing error messages in over 30 percent of our test runs. These delays and functionality issues can cause problems for multinational corporations with offices around the world.

Want to try out the tests yourself? Follow the methodologies at the end of this report.

This is the first report in our five-part series that explores the performance of Microsoft Office 365 and G Suite when set up in the United States and accessed abroad from Paris. These scenarios show how the two suites perform for employees that travel or who work outside of their U.S. headquarters. Read the full series for a more complete picture of each cloud's performance for multinational companies



Additional reports in the “A cloud abroad in Paris” series:

[A comparison of Google Drive™, Microsoft OneDrive® for Business, and SharePoint® Online in Paris](#)

[A comparison of Google Hangouts™ and Skype™ for Business in Paris](#)

[A comparison of Gmail™ and Outlook® in Paris](#)

[A comparison of Google Sites™ and Microsoft SharePoint Online in Paris](#)

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- 1 We calculated error rates based on the total runs for all the tasks on laptops included in the report. We did not encounter any errors on mobile devices.
 - 2 We reported an error if we were unable to complete the task on three consecutive runs.

On August 18, 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 August 22, 2016.

On September 29, 2016, Google rebranded Google Apps for Work as “G Suite.” We completed our testing prior to that rebranding.

Appendix A – What we tested

The table below shows the system information for the mobile device we tested.

System	Google Nexus™ 6P
Processor	
Vendor	Qualcomm®
Model number	Snapdragon™ 810
Core frequency (GHz)	1.95 + 1.55
Number of cores	8 (4 + 4)
Memory	
Amount (GB)	3 (built-in onboard)
Type	LPDDR4
Graphics	
Vendor	Qualcomm
Model number	Adreno™ 430
Storage	
Amount (GB)	64
Type	NAND Flash
Connectivity	
Wireless internet	802.11ac (802.11a/b/g/n compatible)
Cellular	LTE Advanced
Bluetooth	4.2
Battery	
Type	Lithium-polymer
Size	Integrated
Rated capacity (Wh)	13.11
Display	
Size	5.7"
Type	AMOLED widescreen Multi-Touch
Resolution	1,440 x 2,560

System	Google Nexus™ 6P
Camera	
Front-facing (MP)	8
Rear-facing (MP)	12.3
Operating system	
Vendor	Google
Name	Android
Build number or version	6.0.1
Dimensions	
Height	6.27"
Width	3.06"
Depth	0.28"
Weight (oz.)	6.27

The table below shows the system information for the laptops we tested.

System	Apple® 13" MacBook Air (Early 2015)	Lenovo™ ThinkPad® X1 Carbon
Processor		
Vendor	Intel®	Intel
Model number	Core™ i5-5250U	Core i7-6600U
Core frequency (GHz)	1.6 (up to 2.7 Turbo Boost)	2.6 (up to 3.4 Turbo Boost)
Number of cores	2	2
Cache	3MB L3	4MB L3
Memory		
Amount (GB)	8 (built-in onboard)	8 (built-in onboard)
Type	LPDDR3	LPDDR3
Speed (MHz)	1,600	1,866
Integrated graphics		
Vendor	Intel	Intel
Model number	HD Graphics 6,000	HD Graphics 520
Storage		
Amount (GB)	256	256
Type	PCIe-based flash	PCIe NVMe™ SSD

System	Apple® 13" MacBook Air (Early 2015)	Lenovo™ ThinkPad® X1 Carbon
Connectivity/expansion		
Wireless internet	802.11ac (802.11a/b/g/n compatible)	802.11ac (802.11a/b/g/n compatible)
Bluetooth	4.0	4.1
USB	2 x 3.0	3 x 3.0
Thunderbolt	2 x 2	N/A
Video	N/A	1 x HDMI®, 1x Mini DisplayPort
Battery		
Type	Lithium-polymer	Lithium-polymer
Size	Integrated	4-cell
Rated capacity (Wh)	54	52
Display		
Size	13.3"	14"
Type	LED-backlit glossy widescreen display	LED IPS
Resolution	1,440 x 900	1,920 x 1,080
Touchscreen	No	No
Operating system		
Vendor	Apple	Microsoft
Name	OS X El Capitan	Windows 10 Pro
Build number or version	10.11.6	1607, OS Build 14393.67
Camera		
Front-facing	720p FaceTime HD	720p
Dimensions		
Height	0.11" to 0.6"	0.6"
Width	12.8"	13.1"
Depth	8.94"	9.00"
Weight (lb.)	2.96	2.58

Appendix B – How we tested

About our testing

Network infrastructure

We used two of each device under test. We connected the two devices in each pair to separate wireless networks. We connected the devices to the 5GHz band of identical, 802.11ac-based TP-Link AC1750 wireless routers. We configured each router identically but set them to use different channels, to ensure minimum traffic from nearby networks. We ran each test between two laptops or phones of the same model and using the same browser (when applicable) with different users on isolated networks. To minimize the impact of bandwidth performance, we tested Google Docs and Microsoft Word Online at approximately the same time of day for each task.

Devices

- Lenovo ThinkPad X1 Carbon (Windows 10)
- Apple 13" MacBook Air (OS X El Capitan)
- Google Nexus 6P (Android 6.0.1)
- Apple iPhone 6s Plus (iOS 9.3.4)

OS and browser versions

- OS X El Capitan
 - Chrome 52.0.2743.116
 - Safari 9.1.2
- Windows 10
 - Chrome 52.0.2743.116 m
 - Edge 38.14393.0.0
- Android 6.0.1
- iOS 9.3.4

File corpus (sizes are approximate)

- Word document:
 - SampleDoc.docx (1.25 MB)
- Table:
 - SampleTable.docx (58 KB)
- Text files:
 - Text-100KB.txt (100 KB)
 - Text-500KB.txt (500 KB)
 - Text-1MB.txt (1 MB)
- Image files:
 - Image-2MB.jpg (2 MB)
 - Image-22MB.png (22 MB)

Test practices

- On Windows 10, we ran the tests in both Google Chrome and Microsoft Edge. On OS X, we ran the tests in both Google Chrome and Safari.
- On mobile devices, we closed relevant apps and removed them from memory before each test run to ensure consistent behavior.
- We assumed that all necessary users had logged into the respective services prior to testing.
- We assumed that push notifications were enabled for the Gmail and Outlook apps on both Android and iOS.
- We ran all tests were run on a 100Mbps down and 20Mbps up connection.

Performing tasks using browser-based interface on Windows and OS X laptops

Creating a new document

1. In a browser, navigate to the directory listing page for the cloud storage solution under test.
2. Click New, and prepare the stopwatch.
3. Simultaneously start the stopwatch and click New→Google Docs (in Google Drive) or New→Word document (in OneDrive for Business).
4. When the new document fully loads and is editable, stop the stopwatch.
5. Record the result.

Syncing between users/devices during real-time collaboration in a shared document

1. In a browser on Laptop 1, open the existing SampleDoc.docx file in the online editor.
2. In Google Docs, click Share, enter the email address of the user with whom you will collaborate, and click Done. In Word Online, enter the email address of the user with whom you will collaborate, and click Share.
3. On Laptop 2 (the same model as Laptop 1), open the same browser being used in Laptop 1, and open the shared document from email or the cloud storage solution's browser-based interface.
4. Once both users have the same document open in the online editor, have the user on Laptop 1 prepare the material under test as follows:
 - a. For tests that require inserting text, open the relevant text file, and copy all of the text to the clipboard.
 - b. For tests that require inserting images, click Insert→Image (in Google Docs) or Insert→Picture (in Word Online).
 - c. For the test that requires inserting a table, open the SampleDoc.docx file and copy the entire calendar table to the clipboard.
5. Simultaneously start the stopwatch and paste the text, insert the image, or insert the table at the very beginning of the document.
6. When the text, image, or table fully appears in the document open on Laptop 2, stop the stopwatch.
7. Record the result.

Sharing a document via email

1. Prepare Laptop 2 by navigating to the browser-based email client for the platform under test, Gmail or Outlook Online.
2. On Laptop 1, navigate to the directory listing page for cloud storage solution under test, and prepare the stopwatch.
3. Right-click the document to share, and click Share. Enter the email address of the account being used on Laptop 2.
4. Simultaneously start the stopwatch and click Done (in Google Docs) or Share (in OneDrive for Business).
5. When the email containing the invitation to the shared document arrives in the inbox on Laptop 2, stop the stopwatch.
6. Record the result.

Performing tasks using native mobile apps on Android and iOS phones

Sharing a document via email

1. On Phone 1, open the native cloud storage app under test (Google Drive or OneDrive), and make sure Phone 2 is on hand, as it will receive the notification of the document being shared.
2. Prepare the stopwatch, and select the document to be shared as follows:
 - a. In Google Drive for Android and iOS, touch the More options icon next to the file you wish to share, and select Add people. Enter the email address of the user on Phone 2, and touch the triangular share icon. Simultaneously start the stopwatch and click the OK button (Android) or Share button (iOS) in the confirmation modal dialog.
 - b. In OneDrive for Android, check the box next to the document to be shared, then touch the Share icon in the top bar. Touch the Invite people button. Enter the email address of the user on Phone 2. Simultaneously start the stopwatch and touch the triangular Send icon.
 - c. In OneDrive for iOS, do a long touch on the document to be shared, then touch the Share icon. Touch the Invite People button. Enter the email address of the user on Phone 2. Simultaneously start the stopwatch and touch the Add button.
3. When Phone 2 receives a notification of the email with the shared document link, stop the stopwatch.
4. Record the result.

Performing tasks using native mobile apps on Android and iOS phones and browser-based interface on Windows and OS X laptops

Syncing between users/devices during real-time collaboration in a shared document

1. On the Android phone, open the native cloud storage app under test, and navigate to the folder containing the document to be shared with the laptop user.
2. Share the document as follows:
 - a. In Google Drive, touch the More options icon next to the file you wish to share and select Add people. Enter the email address of the laptop user and touch the triangular Share icon. Click the OK button in the confirmation modal dialog.
 - b. In OneDrive, check the box next to the document to be shared, then touch the Share icon in the top bar. Touch the Invite people button. Enter the email address of the laptop user. Touch the triangular Send icon.
3. On the laptop, open the proper browser for the scenario being tested, and open the shared document from email or the cloud storage solution's browser-based interface.
4. Once the laptop user has the shared document open in the online editor, have the Android user prepare the material under test as follows:
 - a. For tests that require inserting text, copy the test paragraph from the existing document to the clipboard.
 - b. For tests that require inserting images, click Insert→Image→From photos (Google Docs) or Insert→Pictures→Photos (Word).
5. Simultaneously start the stopwatch and paste or insert the text or image at the very beginning of the document.
6. When the text or image fully appears in the document open on the laptop, stop the stopwatch.
7. Record the result.

This project was commissioned by Google.



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