PROWESS

KEEP YOUR COMPANY FROM FALLING BEHIND

Tests prove new PCs can improve productivity and your competitive edge

Executive Summary

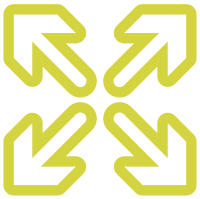
"Old, inefficient technology is a major frustration for today's workers, with 45 percent of survey respondents saying they spend a huge portion of their day navigating outdated technologies," according to a Salesforce.com blog post commenting on a July 2016 survey by Appirio.[1]

In a healthy economy, your company can't afford to lose talent for any reason. You also can't afford to have employees waste time waiting for outdated technology to execute on critical business activities—activities that keep your company profitable and competitive. It's likely that most of your staff are executing those critical business activities on a PC—most likely a laptop (or mobile) PC. The question is whether the PCs your staff are using fall into the category of "old, inefficient technology," and if so, what's the potential impact on productivity and retention? To help find out, Prowess Consulting tested a Lenovo® ThinkPad® T420, powered by a 2nd generation Intel® Core™ i5-2520M processor, against an HP® Spectre x360 convertible laptop, powered by a 7th generation Intel Core i7-7500U processor.

Our results show that in real-world, everyday use cases, newer mobile PCs with newer processors consistently outperform older models and often dramatically. Our results also demonstrate that the slower performance of older mobile PCs can waste more time than a company might realize—wasted time that can frustrate employees and open doors for competitors to use to woo away employees. That wasted time might also hurt productivity and create an opportunity for competitors to woo away customers.

Compared to older mobile PCs, we found that newer mobile PCs:

Boot faster and run longer



Maximize productivity

Reduce time spent waiting

How Does the Efficiency of Older PCs Compare to Newer PCs?

Do your office's older mobile PCs qualify as "old, inefficient technology?" Do they force your staff to spend too much time waiting while your competitors move ahead? Are your employees on their phones looking for jobs at your competitors that use better, newer tools and technologies while their older PCs catch up?

To compare the effect of older mobile PCs on efficiency and productivity against newer PCs—and how that might play into the answers to these questions—Prowess Consulting put two representative mobile PCs through a series of everyday scenarios that reflect the tasks real-world users perform every day. The systems we tested are:

VS.

A Lenovo® ThinkPad® T420, powered by a 2nd generation Intel® Core™ i5-2520M processor and running Windows® 7 Enterprise

An HP® Spectre x360 convertible laptop, powered by a 7th generation Intel Core i7-7500U processor and running Windows 10 Enterprise

We chose the Lenovo ThinkPad T420 because it's similar to the computers many companies purchased four or more years ago and still use today. We did not test running Windows® 10 on the ThinkPad T420 because the device couldn't be upgraded to Windows 10; the newest Windows version that the device can handle is Windows 7. We chose to compare the 2nd generation processor to the 7th generation processor—the newest on the market at the time of our testing—to see just how much the added capabilities of a 7th generation processor, which was brought to market more than five years after the 2nd generation processor, might affect performance.

Testing Approach

For this report, Prowess Consulting tested the performance differences between two devices in two different functional tests. We recorded both the raw processing times for completing each task and the times that the tester spent completing tasks while interacting with the devices and applications.

We found that the newer PC with the newer processor multitasks better and performs faster, which reduces time spent waiting—especially on compute-intensive tasks, such as those that involve video. Overall, the newer device completed tasks more quickly across the board, often dramatically reducing the time users spend waiting. Our consensus is that newer PCs might give your business an advantage, not only with employee productivity, but with employee retention and your competitive efforts.

Boot More Quickly and Recharge Less Often

Productivity starts the minute your employees enter the office. And in our testing, the newer PC outperformed the older PC right from the moment it booted up. The newer PC, with its 7th generation Intel® processor, booted 382 percent faster than the older PC, with its 2nd generation processor. That's 44.54 seconds faster, or almost three-quarters of a minute. Over the course of a normal work year with 261 work days, an employee who boots up just one time each day will save 3.23 hours using the new PC.[2] For a company with 50 employees, that could mean an annual savings of 20.18 days—days that could be spent executing on critical business needs.

382%

faster boot time for the newer PC powered by a 7th generation Intel® processor

Getting up and running is just one contributor to productivity. Another is staying up and running. The newer PC with the 7th generation processor also dramatically outshone the older device with the 2nd generation processor by staying charged 1.55 times longer when running a 4K video. In our testing, the newer system ran for two hours and thirteen minutes compared to the older system, which ran for just one hour and twenty-six minutes. CPUs are under strain when running 4K videos, which is why we used a 4K video to drain the systems and quickly gauge overall battery performance. Even though your employees outside of your marketing department might not work with videos often, when you extrapolate the added battery life to other activities that tax the CPU to a lesser degree than video, any user with a newer PC is likely to spend more time working and less time stopping to plug in. The time saved can also reduce frustration and keep employees happier.

1.55x

longer battery life for the new PC powered by a 7th generation Intel® processor

Work Faster and Maximize Productivity

Booting more quickly and charging less often are important, but so is being more productive on the typical tasks employees perform throughout their workdays. In our testing, we saw measurable efficiency gains using the new PC for multiple representative tasks.

Velocity with Video

Intel promotes its 7th generation processors as being optimized for 4K video, and our testing backs that claim. Our tests found that users can spend anywhere from 45 to 86 percent less time waiting using the 7th generation processor–powered device for video-related tasks compared to the 2nd generation processor–powered device.

596%

faster to share a video on YouTube™ with the new PC powered by a 7th generation Intel® processor

We tested converting a one-hour 4K video to 1080p H.264, which reduces file size to enable faster Internet transfers, such as to YouTube™, or for viewing on portable devices. The 4K video file we started with was 1.19 GB in size. After converting it to 1080p H.264, it was only 206 MB. We tested the conversion using two different applications, Adobe® Media Encoder and Lightworks® Free. In both applications, the new PC with the 7th generation processor converted the video dramatically faster than the older PC. Video conversion in Adobe Media Encoder was 5.54 minutes faster on the new PC, which means the user spent 47 percent less time waiting for the conversion to finish. Similarly, in Lightworks Free, the new PC converted the video 4.54 minutes faster than the older PC, which means the user spent 45 percent less time waiting. Extrapolate those savings out to a year, and just one user converting one video per day will save roughly 20 hours per year. That's half a work week saved for a single user.

88%

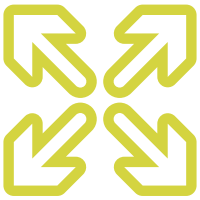
faster to convert a one-hour 4K ultra-high definition (UHD) video to 1080p H.264 with the new PC powered by a 7th generation Intel® processor

Sharing a video is also faster on the newer PC. In our testing, uploading the converted video to YouTube resulted in 86 percent less time waiting by taking 451.79 seconds—or 7.53 minutes—less time on the new PC than the older PC. Similarly, in Vimeo®, the user spent 85 percent less

time waiting with a savings of 455.53 seconds, or 7.59 minutes, using the newer PC. If your social-media or communications teams share just one video on YouTube or Vimeo per day for a year, your company can save 33 hours per year. That is 33 hours your team can use to strategize, do competitive research, invest in training, or perform any other activity that doesn't involve waiting for a computer to finish a task.

Productivity Gains Between Boot and Shut Down

Employees in almost every industry use the Internet to access online applications and tools and to research everything from prospective clients to competitive companies to information for staying current on their skills. You invest in Internet services and servers to provide reliable Internet access for your employees, but are you short-changing them—and your profitability—with older PCs that make accessing the Internet slow and tedious?



119%

faster multitasking in Microsoft® Office with the new PC powered by a 7th generation Intel® processor

To see just how much time a newer PC with a 7th generation processor might save when accessing the Internet, we tested connecting to the web, browsing to a website, and downloading an image file using Google™ Chrome™. The new PC's processor completed the task 8.51 seconds faster than the older PC's processor, which means an employee would spend 27 percent less time waiting and would complete the task 38 percent faster with newer technology. Just opening Chrome was 21 percent faster on the newer PC. If 50 employees browse the Internet and download a file just once per day, your company could gain 3.86 days per year—30.85 hours—which could be used on more productive tasks.

In our testing, the newer PC also outperformed the older one when working in standard Microsoft® applications. In our test scenario, we had a user multitask with Microsoft® Office, Microsoft® Excel®, Microsoft® PowerPoint®, and Microsoft® Outlook® all open at the same time, while performing tasks that required switching between applications. The new PC, with its 7th generation processor, was 119 percent faster than the older PC, with its 2nd generation processor, in our use cases. Our user spent 54 percent less time waiting for the computer to complete the tasks or catch up in the workflow. That savings would equal 6.32 hours each year for one user doing these tasks four times daily. If 50 employees multitask in Microsoft applications four times per day for one year, the company saves 316.10 hours or 39.51 days per year. That's nearly one full week your employees won't spend waiting for outdated technology, which can help keep them happier and more likely to stay on board.

Time savings and performance gains with the newer PC were common in our testing. Figure 1 shows a sample of the gains we saw.

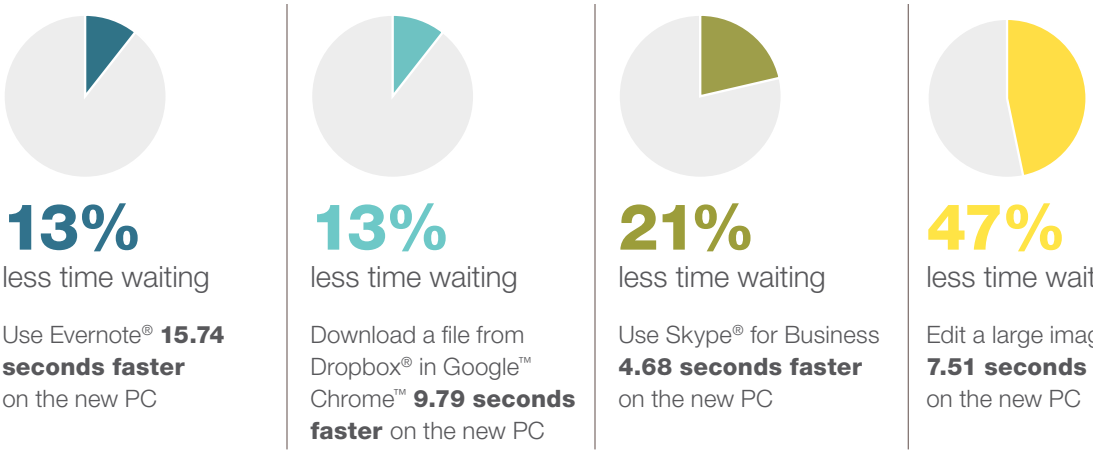


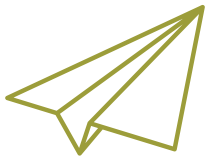
Figure 1. A sampling of performance gains on tasks using the newer PC with the 7th generation Intel® processor compared to the older PC with the 2nd generation Intel processor; all results are based on the time that the tester spent completing the task while interacting with the device and applications

PCs with Newer Processors Offer More Than Great Performance

The newer PC we tested is faster than the older PC, which boosts productivity for you and your staff. The newer PC also offers you and your employees benefits that extend beyond improved performance and productivity gains.

Less Wait *and* Less Weight

The HP Spectre x360 we tested is 51 percent lighter than the older ThinkPad T420 at 2.45 pounds compared to 4.78 pounds. That lighter weight reduces a significant burden for anyone carrying a mobile PC around—whether to a conference room on another floor, to home and back, or through an airport.



51% lighter

2.45 lbs HP® Spectre x360 convertible laptop
4.78 lbs Lenovo® ThinkPad® T420

A Better Way to See

7th generation Intel processors come equipped with better graphics cards and support more monitors—three versus two for the devices we tested—as well as 4K or ultra-high-definition (UHD) video. Support for more monitors gives employees more options in how they work, and it can be beneficial for employees who work on the computer all day, especially if working on

code, accounting, analysis, and other text- or number-intensive tasks. And 4K video support for viewing, creating, converting, and editing videos gives all your employees tools capable of supporting current video standards.

A Better Way to Connect

7th generation Intel processors offer Bluetooth® 4.0 support, which allows devices to communicate with any device running Bluetooth 4.0 or earlier, be it a phone or a computer. The 2nd generation processor is limited to Bluetooth 3.0 support, meaning it might not connect to newer Bluetooth devices.

Thunderbolt™ 3 is one of the newest features supported by 7th generation processors. Thunderbolt 3 is a connectivity cable that works with any USB-C interface. USB-C transfers data twice as fast as USB 3.0. On top of that added speed, Intel reports that Thunderbolt 3 can transfer data at speeds up to 40 gigabits per second (Gbps), whereas USB-C is limited to 10 Gbps without Thunderbolt 3. Thunderbolt 3 is versatile enough to connect with a variety of external devices, including displays, USB devices, docks, chargers, and more. It also supports a 10 gigabit Ethernet (GbE) peer-to-peer connection so that users can transfer files between computers or set up shared storage solutions. You can find out more about Thunderbolt technology at https://thunderbolttechnology.net/.

Strong, Convenient Security

Intel continually improves security features on its processors, much like it continually improves performance. The newer 7th generation Intel processors have True Key™ by Intel Security. True Key is both a security and usability feature; by using the True Key app, users can log in to a PC, in addition to websites and applications, using voice, face, fingerprint, and password protection, which provides both convenience and multi-factor authentication.

The newer 7th generation processor's support for Windows 10 also makes it possible for users to take advantage of Windows Hello™ features, including support for facial recognition for logging in. The 2nd generation processor is limited to running operating systems only up to Windows 7, which does not include or support Windows Hello.

More Memory

The 7th generation Intel processor has 1 MB more Intel® Smart Cache–enabled memory, which allows all of the processor's cores to dynamically share access to the last-level cache (LLC), an area of faster memory on the chip. The newer PC with the 7th generation processor also supports more memory overall. The PC can have up to 32 GB compared to a limit of 16 GB on the 2nd generation processor–powered device. More memory capacity is critical for employees using multiple types of applications and working with larger files, including videos.

To learn more about how the 7th generation processor and 2nd generation processor we tested compare, see http://ark.intel.com/compare/95451,52229.

Newer Mobile PCs Can Improve Productivity and Your Company's Ability to Retain Talent

The estimated cost to replace a salaried employee ranges from two months' salary to two times the employee's annual salary.[3] For an employee making $50,000 annually, that could equal somewhere from $8,300 to $100,000.[3] The cost of replacing an outdated computer with a new one, however, is between $750 to $1,500, depending on the unit you buy and the software you add.[4] Granted, a new computer isn't all inclusive in the retention equation, but compared to even $8,300 to replace an employee, it's a pretty cheap contribution—and one that doesn't account for the monetary benefits of increased productivity and the increased ability to compete in your market.

> The estimated cost to replace a salaried employee is from two months' salary to two times the employee's annual salary.[3]

Our tests show that newer mobile PCs powered by 7th generation Intel processors save employees time in completing tasks compared to older, 2nd generation Intel processor–powered PCs, leading to reduced frustration and saved hours or days. Newer PCs also include newer functionalities to help you keep pace with business advances and user and customer expectations.

Consider the Value of Moving to New PCs

To keep talent and maximize productivity, it might be time to upgrade your company's outdated PCs to newer mobile PCs powered by current processors. When you do, you can give your employees access to proven benefits that include the ability to:

- Boot faster
- Recharge less often
- Support ultimate video creation and use
- Support greater overall general productivity
- Enable faster browsing on the Internet
- Support the newest technology features, making users future-ready and more secure
- Make use of lighter, more portable devices

Appendices

Appendix A: Hardware and Test Environment

Hardware Devices		
Model	Lenovo® ThinkPad® T420	HP® Spectre x360 Convertible Laptop
Model number	4180	13-w063nr
Processor	Intel® Core™ i5-2520M processor	Intel Core i7-7500U processor
Processor speed (GHz)	2.5 GHz	2.7 GHz
Storage (GB)	500 GB	500 GB
Cache	3 MB Intel® Smart Cache	4 MB Intel Smart Cache
RAM	8 GB	16 GB
Operating system	Windows® 7 Enterprise	Windows 10 Enterprise
Battery	38 Wh, Li-ion	57.8 Wh Li-ion
Display	13.4 in. x 9.2 in. x 1.2 in.	12.8 in. x 9.03 in. x 0.41 in.
Resolution	1,366 x 768	1,920 x 1,080
Graphics	Intel® HD Graphics 4000	Intel HD Graphics 620
Camera	None (some ThinkPad T420 models do come with cameras)	HP® TrueVision® HD camera with dual-array digital microphone
Ports	• 2 x USB 2.0 • Video Graphics Array (VGA) • LAN • DisplayPort™ • Headphone/microphone combo jack • Powered USB 2.0 • USB 2.0/eSATA	• 1 x USB 3.1 Gen 1 • 2 x USB Gen 2
Audio	• Stereo speakers • Stereo microphone	• Bang & Olufsen®; quad speakers
Networking	802.11n	Intel® Wireless-AC (802.11ac) 2x2 technology and Bluetooth® 4.0 combo
Weight	4.78 lbs	2.45 lbs
Software		
Microsoft® PowerPoint® 2016	Not applicable (NA)	16.0.6965.2115
Microsoft® Outlook® 2016	NA	16.0.6965.2115
Microsoft® Excel® 2016	NA	16.0.6965.2115
Skype® for Business 2016	NA	16.0.6925.1048
PowerPoint 2013	15.0.4883.1000	NA
Outlook 2013	15.0.4893.1000	NA
Excel 2013	15.0.4893.1000	NA
Skype for Business 2015	15.0.4893.1000	NA
Google™ Chrome™	55.0.2883.87	55.0.2883.87
Internet Explorer®	11.0.9600.18537	11.576.14393.0
Evernote®	Web	Web
Adobe® Acrobat® Reader®	2015.020.20042	2015.020.20042
Adobe® Photoshop®	2017.0.1	217.0.1
Dropbox®	Web	Web
Adobe® Media Encoder	11.0.0.131	11.0.0.131
Lightworks® Free	12.6	12.6
Windows Media® Player	NA	12.0.14393.693
VLC® Media Player	2.2.4	2.2.4

File Sizes Used in Testing Use Cases	
Image (.jpg)	114 MB
Logo Image (.png)	240 KB
Microsoft® PowerPoint®	54 MB
Microsoft® Excel®	26.8 MB
4K Video (.mp4)	1.19 GB
4K Video Converted to 1080p H.264 (.mp4)	206 MB
PDF	5 MB

Appendix B: Processor-Only Functional-Testing Steps and Results

For each process listed below, typically the timer is started, one step is completed, and then the timer is stopped as indicated. Timed results are for the cumulative time of all steps for each process.

COMPUTER STARTUP

1. Push the power button, and then start the timer.
2. Stop the timer when the logon screen appears.
3. Enter the ***password***, press **Enter**, and then start the timer.
4. Stop the timer when the Windows desktop appears.

COMPUTER WAKE

1. Push the power button, and then start the timer.
2. Stop the timer when the logon screen appears.

BATTERY USAGE

1. Completely charge the battery.
2. Start the timer.
3. Open VLC® Media Player.
4. Open a 4K video, and then press play.
5. Ensure the **Repeat** option is selected.
6. Check the remaining percent of battery life each hour for three hours.

VIDEO CONVERSION FROM 4K TO 1080P H.264 USING ADOBE MEDIA ENCODER

1. Start the timer.
2. From the taskbar, open **Adobe Media Encoder**.
3. Stop the timer when the program is open.
4. Start the timer.
5. Click the **Play** icon to convert a video.
6. Stop the timer when the video conversion is complete.

VIDEO CONVERSION FROM 4K TO 1080P H.264 USING LIGHTWORKS FREE

1. Start the timer.
2. From the taskbar, open **Lightworks Free**.
3. Click **Start** to export the video to Vimeo.
4. Stop the timer when the video conversion is complete.

SHARE A VIDEO ON YOUTUBE

1. Open YouTube and start the timer.
2. From YouTube, click **Upload Video**.
3. Stop the timer when the video upload is complete.

SHARE A VIDEO ON VIMEO

1. Open Vimeo and start the timer.
2. From Vimeo, click **Upload Video**.
3. Stop the timer when the video upload is complete.

OPEN CHROME AND DOWNLOAD AN IMAGE FILE

1. From the taskbar, click the **Chrome** icon, and then start the timer.
2. Stop the timer when the program is open.
3. Click **OK** to download a file, and then start the timer.
4. Stop the timer when the file is fully downloaded.

EDIT AN IMAGE IN ADOBE® PHOTOSHOP®

1. From the taskbar, click the **Photoshop** icon, and then start the timer.
2. Stop the timer when the program is open.
3. Click **Open** to open a file, and then start the timer.
4. Stop the timer when the file is open.
5. Click **OK** to save the file, and then start the timer.
6. Stop the timer when the save bar at the bottom of the screen fills.

EVERNOTE® TASKS

1. From the taskbar, click the **Evernote** icon, and then start the timer.
2. Stop the timer when the program is open.
3. Click **Save**, and then start the timer.
4. Wait for notification that the clipped web image has been saved, and then stop the timer.
5. Click **Save**, and then start the timer.
6. Wait for notification that the web article has been saved, and then stop the timer.

MULTITASK IN MICROSOFT® OFFICE 365®

1. From the taskbar, click the **Excel** icon, and then start the timer.
2. Stop the timer when Excel is fully open.
3. Click **Open**, and then start the timer.
4. Stop the timer when the file is fully open.
5. From the taskbar, click the **PowerPoint** icon, and then start the timer.
6. Stop the timer when PowerPoint is fully open.
7. Click **Save**, and then start the timer.
8. Stop the timer when the save bar at the bottom of the screen fills.
9. From the taskbar, click the **Outlook** icon, and then start the timer.
10. Stop the timer when Outlook is fully open.
11. Click **Send**, and then start the timer.
12. Stop the timer when the send bar at the bottom of the screen fills.

SKYPE® FOR BUSINESS MEETING

1. From a reminder alert from Outlook, click **Join Online**, and then start the timer.
2. Wait for the meeting to load; stop the timer when a message appears asking about audio.
3. From the FYI dialog box, click **OK**, and then start the timer.
4. Stop the timer when the desktop is fully loaded.

UPLOAD A FILE TO DROPBOX® USING CHROME

1. Drop the combined files into Dropbox, start the timer, and then wait for the files to finish uploading.
2. Stop the timer when the upload is complete.

DOWNLOAD A FILE FROM DROPBOX USING CHROME

1. Click **Download**, start the timer, and then wait for the combined files to download.
2. Stop the timer when the download is complete.

Processor-Only Functional-Testing Results	Lenovo® ThinkPad® T420	HP® Spectre x360 Convertible Laptop	HP Spectre x360 Time Difference Compared to the ThinkPad T420
Computer startup	56.19 seconds	11.65 seconds	44.54 seconds
Computer wake	2.98 seconds	2.49 seconds	0.49 seconds
Battery usage	Ran for 1 hour 26 minutes	Ran for 2 hour 13 minutes	1.55x better battery life
Video conversion from 4K to 1080p H.264 using Adobe® Media Encoder	711.19 seconds	378.96 seconds	332.23 seconds
Video conversion from 4K to 1080p H.264 using Lightworks® Free	601.27 seconds	329.13 seconds	272.14 seconds
Share a video on YouTube™	27.41 seconds	24.18 seconds	3.23 seconds
Share a video on Vimeo®	1,062.44 seconds	155.32 seconds	907.12 seconds
Open Google™ Chrome™ and download an image file	31.14 seconds	22.63 seconds	8.51 seconds
Edit an image in Adobe® Photoshop®	15.40 seconds	13.34 seconds	2.06 seconds
Evernote® tasks	5.45 seconds	4.53 seconds	0.92 seconds
Multitask in Microsoft® Office 365®	40.09 seconds	18.29 seconds	21.80 seconds
Skype® for Business meeting	7.88 seconds	6.06 seconds	1.82 seconds
Upload a file to Dropbox® using Chrome	43.09 seconds	42.78 seconds	0.31 seconds
Download a file to Dropbox using Chrome	10.85 seconds	6.24 seconds	4.61 seconds

Times shown are the median of three test runs. Margins of error run from +/–0.1 percent to +/–10.0 percent. Tests were run on a wireless network connection.

Appendix C: Human-Element Functional-Testing Steps and Results

For each process listed below, the timer is started, the steps are completed by a user, and then the timer is stopped when the last step finishes.

COMPUTER STARTUP

1. Press the power button, and then wait for the logon screen.
2. Enter ***password***.
3. Press **Enter** to log on to computer.

COMPUTER WAKE

1. Press Enter or the power button, and then wait for the logon screen.
2. Enter ***password***.
3. Press **Enter** to log on to computer.

VIDEO CONVERSION FROM 4K TO 1080P H.264 USING ADOBE MEDIA ENCODER

1. From the taskbar, click **Adobe Media Encoder** to open the application.
2. From the top-left window, select **Sample_4K**, and then drag the file to the top right window.
3. From the second column, click the drop-down menu, and then select **YouTube 1080p HD**.
4. Click the **Play** icon to convert the video.

VIDEO CONVERSION FROM 4K TO 1080P H.264 USING LIGHTWORKS FREE

1. From the desktop, double-click the **Lightworks** icon to open the application.
2. In the **Project Name** field, type a name, and then click **Create**.
3. Select **Sample_4k** video, and then click **Import**.
4. From the menu on the left, click the **Export edits, clips, or bins** icon.
5. Click **Start** to export the file to Vimeo, which converts the video to a 1080p H.264 format.

SHARE A VIDEO ON YOUTUBE

1. From the task bar, click the **Chrome** icon to open the application.
2. Click the **YouTube** bookmark.
3. At the top right of the screen, click the **Upload** icon.
4. From the task bar, click **File Explorer** to open the utility.
5. Double-click the **Documents** folder.
6. Click and drag **Sample_4K_1.mp4** from the **Documents** folder into Chrome.

SHARE A VIDEO ON VIMEO

1. From the task bar, click the **Chrome** icon to open the application.
2. Click the **Vimeo** bookmark to open.
3. From the top right of the screen, click the **Upload** icon.
4. From the task bar, click **File Explorer** to open the utility.
5. Double-click the **Documents** folder.
6. Click and drag **Sample_4K_1.mp4** from the **Documents** folder into Chrome.

OPEN CHROME AND DOWNLOAD AN IMAGE FILE

1. From the taskbar, click the **Chrome** icon to launch the browser.
2. Click the **Globex** bookmark.
3. Right-click the **JPEG (169.94 MB, 20323x16259px)** link.
4. Select **Save link as**.
5. Click the **Documents** folder.
6. In the **File name** field, type **Globex**, and then press **Enter**.
7. Click the red **X** at the top right corner to close the browser.

EDIT AN IMAGE IN PHOTOSHOP

1. From the taskbar, click the **Photoshop** icon to open the program.
2. Click **File** > **Open** > **Documents**.
3. Double-click **Globex.jpg**.
4. Click **File** > **Open** > **Documents**.
5. Double-click **Zimnix_Logo.png**.
6. Click **Select** > **All**.
7. Click **Edit** > **Copy**.
8. Click the **Globex.jpg** tab.

9. Click **Edit** > **Paste**.
10. Move the logo layer to the bottom left corner of the image.
11. Click **File** > **Save As**.
12. Type **Globex_Image.png**, and then press **Enter** to save.
13. On the **PNG Options** screen, click **OK**.
14. Click the grey **X** in the top right corner of Photoshop to close the program. If prompted about saving, click **No**.

EVERNOTE TASKS

1. From the taskbar, click the **Evernote** icon, and then wait for Evernote to open.
2. In the left-hand menu, hover over **Notebooks**.
3. Click the **+** symbol.
4. In the **Notebook name** field, type **Globex**.
5. Click **OK**.
6. Under **Let's get started!**, click **Clip content from web**.
7. Click the **Globex** bookmark.
8. In the top right of the browser, click the **Clip to Evernote** icon.
9. Select **Screenshot**.
10. Select an area around the image to clip.
11. Beside **Sample Notebook**, click the down arrow.
12. Select the **Globex** notebook.
13. Click **Save**.
14. Click the red **X** at the top right corner to close the browser.
15. Under **Let's get started!**, click **Clip content from web**.
16. Click the **Globex** bookmark.
17. In the top right of the browser, click the **Clip to Evernote** icon.
18. Select **Article**.
19. Select an area around the article to clip.
20. Beside **Sample Notebook**, click the down arrow.
21. Select the **Globex** notebook.
22. Click **Save**.
23. Click the red **X** at the top right corner to close the browser.
24. Click **New Note**.
25. Type **This is a photo I've edited to include the Zimnix logo. I'm considering using it in the sales presentation. The article is about Globex. I want to remember this and leverage some of it during my meeting with the client. Also found that they bring in $1M annually and that the CEO loves motorsports. He's been with the company for 2 years.**
26. Click the red **X** at the top right corner to close the window.

MULTITASK IN OFFICE 365

1. From the taskbar, click the **Excel** icon.
2. Click **Open Other Workbooks**.
3. Click **Browse** > **Documents**.
4. Double-click the **Analysis_File.xlsm** file to open.
5. When prompted about updating links, select **Don't Update**.

6. Click the **ROI** tab at the bottom.
7. In cell **F128**, change the value to **500**.
8. In cell **F125**, change the value to **100**.
9. Select the **Total Cost v Benefits** chart.
10. Press **Ctrl+C** to copy.
11. From the taskbar, click the **PowerPoint** icon to open PowerPoint.
12. Click **Open Other Presentations** > **Browse** > **Documents**.
13. Double-click **SalesProposal.ppt** to open.
14. In the left-hand pane, click slide **8**.
15. Press **Ctrl+V** to paste the copied chart into the slide.
16. In the left-hand pane, click slide **18**.
17. Click **Insert** > **Picture**.
18. Double-click **Globex_Image.png**.
19. Click **File** > **Save As** > **Documents**, type **Globex_Presentation**, and then press **Enter**.
20. Click **File** > **Export** > **Create PDF/XPS Document** > **Create PDFXPS**.
21. Type **Globex_PDF**, and then click **Publish**.
22. From the taskbar, click the **Outlook** icon.
23. Click **New Email**.
24. In the **To** field, type **j.thompson@globex.com**.
25. In the **Subject** field, type **Confirm Appointment**.
26. In the body content, type **Joe, I'm looking forward to meeting with you at noon. I've attached a PDF of the presentation I'd like to go over in case our video connection doesn't work. Sincerely, Michelle**
27. Click **Attach File**.
28. Click **Browse this PC**.
29. Click **Documents**, and then double-click **Globex_PDF.pdf**.
30. Click **Send**.

SKYPE FOR BUSINESS MEETING

1. From a meeting reminder, click **Join Online**.
2. At the audio prompt, click **OK**.
3. Click the camera icon.
4. Click **Start My Video** to start the call.
5. Click the **Present** icon, and then select **Present Desktop**.
6. Click **Present**, and then click **OK** on the FYI screen.

UPLOAD A FILE TO DROPBOX USING CHROME

1. From the taskbar, click the **Chrome** icon.
2. Click the **Dropbox** bookmark.
3. Hold the **Ctrl** key down, and then select **Nebulas_PDF.pdf**.
4. Drag and drop the file to the **Dropbox** website.
5. Click the red **X** at the top right of the browser window to close the browser.

DOWNLOAD A FILE FROM DROPBOX USING CHROME

1. From the taskbar, click the **Chrome** icon.
2. Click the **Dropbox** bookmark.
3. Right-click **Nebulas_Presentation.ppt**, and then select **Download**.
4. Right-click **Nebulas_PDF.pdf**, and then select **Download**.
5. Click the red **X** at the top right of the browser window to close the browser.

Human-Element Functional-Testing Results	Lenovo® ThinkPad® T420	HP® Spectre x360 Convertible Laptop	HP Spectre x360 Time Difference Compared to the ThinkPad T420
Computer startup	75.91 seconds	16.19 seconds	59.72 seconds
Computer wake	7.49 seconds	6.23 seconds	1.26 seconds
Video conversion from 4K to 1080p H.264 using Adobe® Media Encoder	712.28 seconds	385.92 seconds	326.36 seconds
Video conversion from 4K to 1080p H.264 using Lightworks® Free	676.24 seconds	370.54 seconds	305.70 seconds
Share a video on YouTube™	553.99 seconds	88.04 seconds	465.95 seconds
Share a video on Vimeo®	533.12 seconds	91.68 seconds	441.44 seconds
Open Google™ Chrome™ and download an image file	48.80 seconds	30.70 seconds	18.10 seconds
Edit an image in Adobe® Photoshop®	54.27 seconds	46.76 seconds	7.51 seconds
Evernote® tasks	121.94 seconds	106.20 seconds	15.74 seconds
Multitask in Microsoft® Office 365®	159.95 seconds	118.94 seconds	41.01 seconds
Skype® for Business meeting	22.26 seconds	17.58 seconds	4.68 seconds
Upload a file to Dropbox® using Chrome	53.40 seconds	53.46 seconds	–0.06 seconds
Download a file to Dropbox using Chrome	25.86 seconds	16.01 seconds	9.85 seconds

Times shown are the median of three test runs. Margins of error run from +/–0.1 percent to +/–10.0 percent. Tests were run on a wireless network connection.

[1] Salesforce.com. "3 Small Ways You Can Increase Employee Happiness to Positively Impact Your Business." November 2016. www.salesforce.com/blog/2016/11/increase-employee-happiness-business.html.

[2] Based on the U.S. Office of Personnel Management's work days of 261 in 2017: www.opm.gov/policy-data-oversight/pay-leave/pay-administration/fact-sheets/computing-hourly-rates-of-pay-using-the-2087-hour-divisor/.

[3] Zane Benefits. "Small Business Employee Benefits and HR Blog: Employee Retention – The Real Cost of Losing an Employee." February 2016. www.zanebenefits.com/blog/bid/312123/employee-retention-the-real-cost-of-losing-an-employee.

[4] Center for American Progress. "There Are Significant Business Costs to Replacing Employees." November 2012. www.americanprogress.org/wp-content/uploads/2012/11/CostofTurnover.pdf.

The analysis in this document was done by Prowess Consulting and commissioned by Intel.