



## ON THE GO OR AT A DESK: THE BEST DEVICE FOR USERS' NEEDS

### Executive Summary

Laptops, tablets, 2-in-1 devices, all-in-ones, and desktops: with so many choices, it can be a headache to choose the right device. To help you sort through devices and processors for your organization, our team at Prowess Consulting put a laptop device and a 2-in-1 device through a series of functional use cases to look at how they fit for mobile and desk-based workers. We looked at:

- A 14-inch HP® EliteBook® 840 G3 laptop powered by an Intel® Core™ i5-6200U processor
- A 12-inch HP® Elite x2 1012 G1 2-in-1 device powered by an Intel Core m5-6Y54 processor

### OUR TOP TAKEAWAYS

- Both devices offer excellent and comparable performance for many tasks (see Table 1 on page 6).
- The HP Elite x2 1012 G1 2-in-1 device is ideal for mobile users because it provides 2-in-1 convenience, up to 10 hours of battery life, touch capabilities—which can be enhanced with an HP® Active Pen—and a detachable keyboard.
- The HP EliteBook 840 G3 laptop is ideal for staff who work docked at a desk and on more complex tasks because it provides out-of-the box Ethernet connectivity, more ports, and added performance for compute-intensive tasks (see Table 1 on page 6).



Comparable performance  
for many tasks



HP® Elite x2 1012 G1  
2-in-1 device is optimized  
for mobile users



HP® EliteBook® 840 G3 is  
optimized for desk-based users

# Different Chassis, Same Basic Engine, Different Target Users

The HP EliteBook 840 G3 is a traditional laptop, whereas the HP Elite x2 1012 G1 2-in-1 can be used as either a tablet or a laptop. Despite their different form factors, both devices offer comparable performance on all but the most compute-intensive tasks.

The primary differentiator is the two devices' different form factors that each appeal to different types of users.

## Different Appeal for Different Users

To see which form factor best matches which users, we put the two devices through a series of use-cases that simulated tasks that real-world users perform to do their jobs every day. Our use cases focused on the mobile-optimized form factor of the HP Elite x2 1012 G1 and the desktop-readiness of the HP EliteBook 840 G3.

Prowess Consulting looked at the laptop and 2-in-1 form factors rather than tablets, all-in-ones, or desktops because we wanted to use devices that don't permanently tie users to their desks, but that still deliver the functionality that users need whether at their desks or away.

## Productivity and Ease-of-Use On the Go with the HP® Elite x2 1012 G1

Many workers today are on the go more often than at a desk. These mobile users, or road warriors, want a flexible device that can be used as either a tablet or a laptop and that offers all-day battery life.

In looking at the HP Elite x2 1012 G1, we considered a typical mobile worker as one who uses a wireless network and is mobile most of the time. For example, a sales rep who:

- Works at client sites and various locations out of the office
- Meets with customers and makes presentations at customer sites
- Creates proposal letters, presentations, and statements of work (SOWs), but rarely works on compute-intensive activities
- Uses an HP Elite x2 1012 G1 powered by an Intel Core m5-6Y54 processor

On any given day, a sales rep might get a lead from the corporate marketing team about a hot prospect. Her next steps might have her:

- Create a presentation and a proposal letter to use when she presents to the client
- Download an image, add a logo to the image, and then add the edited image to the presentation
- Modify a spreadsheet to create a chart of anticipated return on investment (ROI) to include in the presentation

To complete her tasks, the sales rep uses common productivity applications, such as one or more web browsers, Microsoft® Paint, Microsoft® Excel®, Microsoft® PowerPoint®, and Microsoft® Word.

The image and PowerPoint files are large (20 MB and 55.4 MB respectively). Despite their sizes, the sales rep uses her HP Elite x2 1012 G1, with its Intel Core m5-6Y54 processor, to complete her tasks in less than seven minutes. At that pace, she could prepare materials for eight prospect meetings every hour, or 64 per day. While such output is not likely to be required of any employee, the numbers speak to the productivity that is possible when a user has the right device for the job. If one-quarter of those prospects become clients, that's an impressive return on the salesperson's improved productivity. She benefits from the HP Elite x2 1012 G1 device's powerful Intel Core M processor combined with the device's ability to be used as a notebook with a keyboard for this task.

### **ADVANTAGES OF THE HP® ELITE X2 1012 G1 2-IN-1 DEVICE FOR MOBILE WORKERS**



- Convertible form factor for use as a laptop or tablet
- Light-weight at just 2.65 lbs with the travel keyboard
- Touchscreen and HP® Active Pen capabilities
- Handles daily workload with ease, including Internet use, email, Microsoft® Office tasks, and using Microsoft® Skype® for Business
- Long battery life supports all-day productivity on the go<sup>1</sup>

At the prospect's office, the sales rep uses her HP Elite x2 1012 G1 in tablet mode to present to the client when the projector in the conference room is broken. She uses the device's touch and swipe abilities to breeze through the PowerPoint presentation—without the obstruction of a keyboard and the potential for mis-clicks that might distract her and her prospect. The system's fan-less design, enabled by its Intel Core M processor, eliminates any distractions that might be caused by fan noise. The sales rep has her prospect's full attention, and she closes the sale before ever leaving the room.

In the parking lot, the sales rep uses Microsoft® OneNote® and the HP Active Pen in the device's tablet mode to quickly capture notes about the meeting and document her follow-up tasks. She is not bogged down trying to type on a keyboard in her lap, and she can complete her notes in less than half a minute before heading back to the office.

At her office, the sales rep uses Microsoft® Skype® for Business to hold a video call with her sales coordinator and get him started on a SOW for the new client. She also sends the coordinator an annotated 19-MB PDF file of the SOW template through Skype for Business just before ending the call.

Despite the size of the file, she is able to open Skype for Business, call her sales coordinator, and send the file in under two minutes. And, even though she has used her device all day, her device still has remaining battery life.<sup>1</sup>

## Long Battery Life and Flexible Form Factor Proves Ideal for Mobile Users

The sales rep could do any of her tasks on a traditional laptop, but her mobile work pattern benefits from the 2-in-1 device's lighter weight. The device also gives her the ability to use it as a tablet with the pen or touchscreen or as a notebook with the extended keyboard. Its long battery life keeps up with her on-the-go day, and the device can handle her typical computing needs. Even in tablet mode, the Intel Core m5-6Y54 processor that powers her HP Elite x2 1012 G1 lets her use multiple apps at a time without sacrificing performance, something that many other tablets cannot do.

## The HP® EliteBook® 840 G3: a Powerful Workhorse at the Office

Some staff need performance maximized for more demanding, compute-intensive tasks, in addition to the ability to dock a computer and adequate ports to quickly connect to needed accessories. These workers are primarily at their desks connected to an Ethernet network, but sometimes they work in conference rooms or take notes during meetings using a wireless connection. They likely use an external monitor or monitors and have multiple applications open at a time.

In looking at the HP EliteBook 840 G3, we considered a typical desk-based or docked user as one who is connected to a LAN and at a desk most of the time, such as a creative director, a business analyst, and a sales coordinator, who:

- Typically work docked at a desk using an Ethernet connection, though occasionally work from a conference room using a wireless connection
- Regularly work on compute-intensive tasks involving data sets, reports, multimedia, and code
- Often multitask, with several applications open at the same time
- Use one or more external monitors
- Use an HP EliteBook 840 G3

## Edit Graphics

The creative director and his team regularly work on compute-intensive graphics tasks, often for sales and marketing. His team created the PowerPoint template that the field sales reps modify for client presentations, the video that sales reps use in those presentations, and multiple other videos, graphics, and files.

At any time, the creative director might get an urgent email from a sales rep who needs him to edit a photo. The added processing power and Ethernet connection available to the creative director with the HP EliteBook 840 G3 laptop lets him enlarge the file for the rep in just over a minute (73. 93 seconds). If he used the rep's HP Elite x2 1012 G1 device, it would take him almost a full minute longer (117.56 seconds). That's not necessarily significant for a single image, but our creative director and his team of four designers each modify up to 10 images

per day—extend that to a year's worth of work days (261 in 2016) and the company will be lost 170 hours, or more than a full third of a week for each person. This is time that could be spent doing something else. These results show that the right device for the job is a crucial ingredient for employee productivity.

## Analyze Data and Create Reports

A business analyst working at the corporate office has previously pulled together three years of performance data for a client similar to a new prospective client. The final Excel file is 26.5 MB in size. She gets a request for the file, but she also receives some new numbers right before sending it. She opens the file and makes a few additions. She can do this quickly and easily on her laptop powered by an Intel Core i5-6200U processor and connected over Ethernet—it takes just 51.10 seconds to complete, compared to the HP Elite x2 1012 G1, which takes 52.40 seconds over wireless. If there are 10 business analysts at a company doing five reports per day, that 1.3-second savings could add up to four hours saved every year; four hours that those analysts can spend analyzing and not waiting for their computers.

## Use Multiple Applications Simultaneously

The sales coordinator works with the field sales rep to create SOWs for new clients. He often has multiple applications open at the same time—a browser, Word, Adobe® Acrobat® Reader®, Excel, and PowerPoint, along with other programs, such as a customer-relationship-management (CRM) application, that require a network connection.

The sales coordinator uses his HP EliteBook 840 G3 with an Intel Core i5-6200U processor over an Ethernet connection to do a variety of tasks with multiple applications open at the same time:

- Edit a Word file
- Edit a spreadsheet in Excel
- Edit a presentation in PowerPoint
- Send a 19-MB attachment in an email using Microsoft® Outlook®

When the sales coordinator performs this series of tasks without closing any of these programs, his HP EliteBook 840 G3 easily handles the load. His time to complete these tasks is just 4.6 minutes over Ethernet; 18.80 seconds faster than if he uses the 2-in-1 device over a wireless connection. If there are 20 coordinators at the company working a similar set of activities four times per day, that 18.80 seconds could save the company 109 hours per year—they might even hire another coordinator part time, which they'll need because the rep is bringing on so many new clients.

## Access Added Productivity over Ethernet

The HP EliteBook 840 G3 laptop, with its out-of-the-box ability to connect to Ethernet, can save time for some users by using an Ethernet connection compared to a wireless one. This savings further substantiates that the HP EliteBook 840 G3 device is ideal for desk-based users with Ethernet access.

**Table 1.** HP® EliteBook® 840 G3 time savings when using an Ethernet connection compared to a wireless connection; for complete test results, see Appendix B

Task	HP® EliteBook® 840 G3 Connected over Wireless	HP EliteBook 840 G3 Connected over Ethernet	Percent Gain Using Ethernet
Edit a photo stored in Microsoft® OneDrive® using Microsoft® Paint	55.5 seconds	49.6 seconds	12%
Take notes in Microsoft® OneNote®	21.3 seconds	15.1 seconds	41%
Make a call and transfer a PDF file using Microsoft® Skype® for Business	117.0 seconds	105.5 seconds	11%

These savings over Ethernet mean added productivity for the employees and the company. If 20 employees take notes 41 percent faster in OneNote, the employees combined—and therefore the company—can save an entire work day every year assuming that those users take notes just once per day. If they take notes three times per day each, that equals three days saved each year—three days that can be spent doing more productive work.

## Ethernet Access and Compute Power Is Ideal for Desk-Based Users

For desk-based users, the HP EliteBook 840 G3, powered by an Intel Core i5-6200U processor, is ideal. It handles compute-intensive tasks, such as photo editing, with ease, and it can seamlessly juggle multiple applications. Its Ethernet port makes it well-suited for in-office staff who are not regularly mobile and who benefit from a faster, wired connection compared to a wireless connection. The HP EliteBook 840 G3 is also portable for use in meetings, where its wider keyboard facilitates the intensive note-taking that users are likely to do.

The HP EliteBook 840 G3 supports up to 32 MB of RAM (ours shipped with 8 MB), which allows for easy upgrades when needed for more demanding workloads, and which can extend the lifecycle of the device.



### ADVANTAGES OF THE HP® ELITEBOOK® 840 G3 FOR OFFICE WORKERS

- Light weight at 3.41 lbs
- Out-of-the box Ethernet connectivity and more ports
- Optimized for working on compute-intensive tasks
- Wider keyboard and display for better productivity when undocked or mobile

## The Chassis

While compute-intensive performance differences exist, the form factor is the main differentiator that plays into which of these devices is right for which type of user.

The HP EliteBook 840 G3 laptop is suitable for use as both a portable laptop or a desktop—docked or not. It has an Ethernet port, a Video Graphics Array (VGA) port, three USB ports, and a docking connector to give users out-of-the box access to connect a monitor and multiple peripherals, in addition to connecting to the LAN. Its 14-inch screen and wider

keyboard than the HP Elite x2 1012 G1 support productivity when a user is away from his or her desk.

The HP Elite x2 1012 G1 2-in-1 device is a smaller, lighter device, and it includes a detachable travel keyboard, allowing it to function effectively as either a laptop or a tablet. The HP Elite x2 1012 G1 has a smaller 12-inch screen and just two USB ports—one of which can be used to dock or charge the device. It offers fan-less operation to eliminate fan noise, which some find distracting. It has a touchscreen and an HP Active Pen (similar to a stylus), which lets the user draw or write on the screen, launch applications, and perform mouse functions.

#### **HP® Elite x2 1012 G1**

with an Intel® Core™ m5-6Y54 processor

2.65 lbs with travel keyboard  
Fan-less



Clickpad with image sensor, multi-touch gestures, and multi-touch capacitive panel; HP® Active Pen

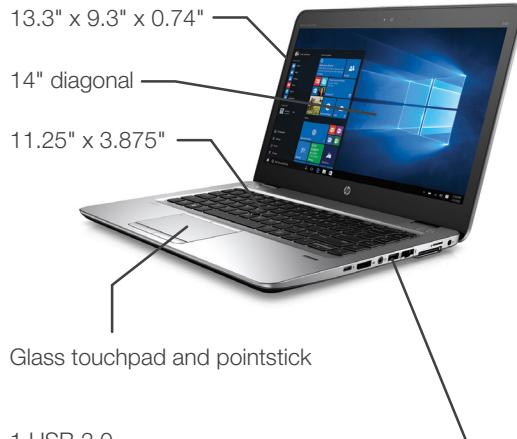
1 USB Type-C™ with Thunderbolt™ support (docking, charging, and USB 3.1)  
1 USB Type-A (USB 3.0)  
1 headphone/microphone combo

4 MB Intel® Smart Cache  
16 GB maximum memory

#### **HP® EliteBook® 840 G3**

with an Intel Core i5-6200U processor

3.41 lbs  
Fan



Glass touchpad and pointstick

1 USB 3.0  
1 USB 3.0 charging  
1 USB Type-C  
1 DisplayPort™  
1 VGA  
1 headphone/microphone combo  
1 AC power  
1 RJ45  
1 docking connector

3 MB Intel Smart Cache  
32 GB maximum memory

**Figure 1.** Lighter, smaller, and fan-less, and with a touchscreen and pen, the HP® Elite x2 1012 G1 is made for mobility; the HP® EliteBook® 840 G3 offers an Ethernet port, a larger screen, and a VGA port to support an added monitor, making it desk-ready, with easy portability when needed

## The Engine

Like the Jaguar® AJ-V6 engine is a specialized version of the Ford® Duratec® V6 engine, the Intel Core i5-6200U processor and the Intel Core m5-6Y54 processor are both 6th generation Intel Core processors built on 14-nm manufacturing-process technology.<sup>2</sup> Both are optimized for high-performance graphics, high-resolution video playback, and strong performance, and both have impressive responsiveness, long battery life, and security.<sup>1</sup> Each processor has two cores and four threads. (For more information on these processors, see <http://ark.intel.com/compare/88202,88193>.)

When we ran the HP EliteBook 840 G3 laptop and the HP Elite x2 1012 G1 2-in-1 device through use cases using a wireless network, the two devices delivered virtually equal performance on basic tasks and had similar long-lasting battery lives—an added boon for mobile users with the HP Elite x2 1012 G1 device, who often work unplugged.<sup>1</sup>

**Table 2.** Comparable performance for the HP® EliteBook® 840 G3 and the HP® Elite x2 1012 G1 over wireless; for complete test results, see Appendix B

Basic Task	HP® Elite x2 1012 G1, Powered by an Intel® Core™ m5-6Y54 Processor	HP® EliteBook® 840 G3, Powered by an Intel Core i5-6200U Processor
Edit a 28.7-KB Microsoft® Word document	66.00 seconds	63.30 seconds
Browse the Internet and download a 20-MB image using Internet Explorer®	73.60 seconds	74.00 seconds
Browse the Internet and download a 20-MB image using Google Chrome™	71.40 seconds	69.60 seconds
Make a simple edit to a 20-MB image using Microsoft® Paint	53.10 seconds	55.50 seconds

On CPU-intensive tasks, such as editing an Adobe® Photoshop® file, the HP EliteBook 840 G3 laptop outperformed the HP Elite x2 1012 G1 2-in-1 device.

**Table 3.** The HP® EliteBook® 840 G3 laptop outperformed the HP® Elite x2 1012 G1 2-in-1 device on CPU-intensive tasks; for complete test results, see Appendix B

Compute-Intensive Task	HP® Elite x2 1012 G1, Powered by an Intel® Core™ m5-6Y54 Processor	HP® EliteBook® 840 G3, Powered by an Intel Core i5-6200U Processor
Enlarge a 109-MB Adobe® Photoshop® file	117.56 seconds	73.93 seconds
Encode a 14.3-MB video file	127.52 seconds	120.51 seconds

## SYMark® 2014 Results

SYMark® is an objective performance benchmark from BAPCo. SYMark uses popular real-world applications for office productivity, media creation, and data/financial analysis to gauge performance. For most users, application-based benchmarks are more meaningful than other benchmarks, because the testing done more closely resembles real-world usage.

In internal SYMark testing done by Intel for the Intel Core m5-6Y54 processor and the Intel Core i5-6200U processor, the Intel Core i5-6200U processor result for overall performance was higher.<sup>1,3</sup> When interpreting results, the higher the SYMark number, the faster the computer should perform overall, especially when performing more compute-intensive tasks. For example, a computer with a number of 1,000 can process roughly twice as much data as a computer with a number of 500, and it would be expected to complete compute-intensive tasks, such as calculations and encoding, more quickly.

**Table 4.** SYSmark® 2014 test results on SYSmark tests performed internally at Intel<sup>1,3</sup>

	<b>Intel® Core™ m5-6Y54 Processor</b>	<b>Intel Core i5-6200U Processor</b>
<b>Internal Intel SYSmark® 2014 test results for the two processors<sup>1,3</sup></b>	820	998

## Keep Your Users Productive with the Best Form Factor for Their Needs

The HP Elite x2 1012 G1 2-in-1 device, powered by an Intel Core m5-6Y54 processor, and the HP EliteBook 840 G3 laptop, powered by an Intel Core i5-6200U processor, are both reliable devices that meet the demands of the use cases. Both devices offer excellent performance for basic tasks (see Table 1 on page 6), which makes either a productive choice.

Form factor is where the devices really diverge. It is crucial to choose the right device for your employees based on the specific roles they fill and how they use their individual devices. Our recommendation:

- The HP Elite x2 1012 G1 2-in-1 device, with its lighter weight and ability to function as either a laptop or a tablet with a touchscreen, and with its HP Active Pen capabilities, delivers performance, flexibility, and convenience for mobile users.
- The HP EliteBook 840 G3 laptop, with out-of-the box Ethernet connectivity and portability, is ideal for staff who typically work at a desk in the office, but who sometimes work, take notes, or present in a conference room, and who do more compute-intensive work.

Table 5 provides a roll-up of which device is best suited for which user roles.

**Table 5.** User profiles well suited to the HP® Elite x2 1012 G1 and the HP® EliteBook® 840 G3

<b>User Role</b>	<b>HP® Elite x2 1012 G1, Powered by an Intel® Core™ m5-6Y54 Processor</b>	<b>HP® EliteBook® 840 G3, Powered by an Intel Core i5-6200U Processor</b>
<b>Mobile/remote workers who are away from a desk more often than not</b>	✓	
<b>Workers who utilize large databases and spreadsheets, run calculations, and create reports</b>		✓
<b>Staff working with high-resolution graphics and creating videos</b>		✓
<b>Employees who run multiple applications simultaneously</b>		✓
<b>Programmers who compile programs and/or run virtual machines</b>		✓

# Appendices

## Appendix A: Hardware and Environment

Devices		
<b>Maker</b>	HP	HP
<b>Model</b>	HP® Elite x2 1012 G1	HP® EliteBook® 840 G3
<b>Processor</b>	Intel® Core™ m5-6Y54 processor, 1.1 GHz, up to 2.7 GHz with Intel® Turbo Boost Technology	Intel Core i5-6200U processor, 2.3 GHz, up to 2.8 GHz with Intel Turbo Boost Technology
<b>Cache</b>	4 MB Intel® Smart Cache	3 MB Intel Smart Cache
<b>RAM</b>	8 GB	8 GB
<b>OS</b>	Windows® 10 Pro 64-bit	Windows 10 Pro 64-bit
<b>Graphics</b>	Intel® HD Graphics 515	Intel HD Graphics 520
<b>Ports</b>	1 USB Type-C™ with Thunderbolt™ support (docking, charging, and USB 3.1); 1 USB Type-A (USB 3.0); 1 headphone/microphone combo	1 USB 3.0; 1 USB 3.0 charging; 1 USB Type-C; 1 DisplayPort™; 1 VGA; 1 headphone/microphone combo; 1 AC power; 1 RJ45; 1 docking connector
<b>Expansion slots</b>	1 microSD™; 1 micro SIM (select models)	1 media-card reader; 1 external SIM
<b>Keyboard</b>	HP® Travel Keyboard	Spill-resistant keyboard with drain
<b>Camera</b>	2 megapixel (MP) full-high-definition (FHD) 1080p front-facing webcam; 5 MP FHD 1080p rear-facing	720p high-definition (HD) webcam
<b>Display size and resolution</b>	12" diagonal FHD UWVA eDP ultra-slim LED-backlit touch screen (1,920 x 1,280)	14" diagonal FHD SVA anti-glare slim LED-backlit (1,920 x 1,080)
<b>Weight</b>	2.65 lbs with travel keyboard	3.41 lbs
<b>Dimensions (W x D x H)</b>	11.8 in. x 8.4 in. x 0.3 in.	13.3 in. x 9.3 in. x 0.74 in.
<b>Wireless</b>	Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2 x 2) wireless and Bluetooth® 4.2 combo	Intel Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2 x 2) wireless and Bluetooth 4.2 combo
Software		
<b>Microsoft® Word 2013</b>	15.0.4815.1000	15.0.4815.1000
<b>Microsoft® PowerPoint® 2013</b>	15.0.4811.1000	15.0.4811.1000
<b>Microsoft® Outlook® 2013</b>	15.0.4815.1000	15.0.4815.1000
<b>Microsoft® Excel® 2013</b>	15.0.4815.1000	15.0.4815.1000
<b>Microsoft® Skype® for Business</b>	15.0.4809.1000	15.0.4809.1000
<b>Google Chrome™</b>	50.0.2661.75 m	50.0.2661.75 m
<b>Internet Explorer®</b>	11.212.10586.0	11.212.10586.0
<b>Microsoft® OneNote®</b>	15.0.4787.1000	15.0.4787.1000
<b>Windows Media® Player (Battery)</b>	12.0.10011.16384	12.0.10011.16384
<b>Adobe® Acrobat® Reader®</b>	2015.010.20060	2015.010.20060
<b>Microsoft® Paint</b>	1511	1511

File Sizes Used in Prowess Use Cases	
<b>Microsoft® Word</b>	28.7 KB
<b>Microsoft® Excel®</b>	26.5 MB
<b>PDF</b>	19.0 MB
<b>Image from Internet</b>	20.0 MB
<b>Video (used in Microsoft® PowerPoint®)</b>	3.84 MB
<b>PowerPoint</b>	55.4 MB
<b>Logo image</b>	240 KB

<b>Adobe® Illustrator®</b>	129 MB
<b>Adobe® Photoshop® (file 1)</b>	113 MB
<b>Adobe Photoshop (file 2)</b>	109 MB
<b>Adobe® After Effects®</b> <b>Video (used for encoding)</b>	14.3 MB

## Appendix B: Functional Use Case Steps and Findings

### BROWSE AND DOWNLOAD A 20-MB FILE FROM THE INTERNET WITH INTERNET EXPLORER®

1. From the taskbar, click the Internet Explorer icon to launch Internet Explorer.
2. In the address bar, type **European Southern**, and then press Enter.
3. Click **eso.org**.
4. In the top menu, click **Images**, and then select the fourth image: **VISTA's infrared view of the Orion Nebula\***.
5. Scroll down to **Image Formats**, and then click **Publication TIFF 4K**.
6. After the file downloads, rename it as **Zimnix\_Image.tif**, and then save it to the **Zimnix** folder in Microsoft® OneDrive®.
7. Close the browser.

### BROWSE TO AND DOWNLOAD A 20-MB FILE FROM THE INTERNET WITH GOOGLE CHROME™

1. From the taskbar, click the Chrome icon to launch Chrome.
2. In address bar, type **European Southern**, and then press Enter.
3. Click **eso.org**.
4. In the top menu, click **Images**, and then select the fourth image: **VISTA's infrared view of the Orion Nebula\***.
5. Scroll down to **Image Formats**, and then select **Publication TIFF 4K**.
6. After the file downloads, rename it as **Zimnix\_Image.tif**, and then save it to the **Zimnix** folder in OneDrive.
7. Close the browser.

### EDIT A 20-MB PHOTO IN MICROSOFT® PAINT

1. From the taskbar, click the folder icon.
2. Click **OneDrive**.
3. Double-click the **Zimnix** folder, where you saved the image from the previous processes.
4. Right-click **Zimnix\_Image.tif**, and then select **Open with Paint**.
5. In Paint, use the controls at the bottom right of the screen to reduce the zoom to **50%**.
6. From the ribbon, click **Select**, select the area that you wish to crop, and then click **Crop**.
7. Click **File > Save As > PNG**, and then name the cropped photo **Zimnix\_Services.png** and save it in the **Zimnix** folder on OneDrive.
8. Click **File > Open**, and then navigate to the **Haytome\_Shared** folder on OneDrive.
9. Double-click **Logo.png** to open.
10. Click **Select**, and then select the area around the logo that you wish to copy.
11. Click **File > Open**, and then open **Zimnix\_Services.png**.
12. Click **Paste**, and then drag the logo image to the bottom-left corner of the image.
13. Click **File > Save** to save the photo under same name in the same location.
14. Close Paint.

## **EDIT A 19-MB FILE IN ADOBE® ACROBAT® READER®**

1. From the taskbar, click the folder icon.
2. Click **OneDrive**.
3. Double-click the **Zimnix** folder, where you saved the image from the previous processes.
4. Double-click **Sale\_proposal\_File.pdf**.
5. In Acrobat Reader, scroll down to page 5.
6. From the ribbon, click the **Add sticky note** icon.
7. Place a sticky note in the area that you wish comment on.
8. Type **Ted, Let's talk about this next week. Bob** in the comment box.
9. Click **File > Save As > My Computer > Choose a folder > Documents > Zimnix**, and then type **SalesPDF.pdf** as the file name.
10. Close Acrobat Reader.
11. From the taskbar, click **Chrome** to launch Chrome.
12. In the address bar, click the **Dropbox®** icon.
13. Click the file icon to upload a file.
14. Click **Choose files**.
15. Navigate to the **Zimnix** folder on the local drive, where the PDF is located.
16. Double-click **SalesPDF.pdf** to upload the file.
17. Close Chrome.

## **INDIVIDUAL MICROSOFT® OFFICE 2013 TASKS**

### **EDIT A 28.7-KB FILE IN MICROSOFT® WORD**

1. From the taskbar, click the Word icon to open Word.
2. Click **Open Other Documents**.
3. Click **OneDrive**.
4. Click **Browse**.
5. Double-click the **Haytone\_Shared** folder where the document is located.
6. Double-click **Business Proposal template.doc** to open the file.
7. In the **To** field, change the company name to **ACME**.
8. In the **From** field, type **Bob Thompson**.
9. Change the date.
10. In the **RE** field, change the company name to **ACME**.
11. On last page, in the **Fee** field, type **\$25,000**.
12. On last page, in the **Our team** field, type **Bob Thompson**.
13. Click **File > Save As > Computer > Documents**, and then save the file with the new name **ACME proposal letter v1**.
14. Click **Save**.
15. Close Word.

## EDIT A 26.5-MB SPREADSHEET IN MICROSOFT® EXCEL®

1. From the taskbar, click the Excel icon to open Excel.
2. Click **Open Other Workbooks**.
3. Click **OneDrive**.
4. Click **Browse**.
5. Double-click the **Zimnix** folder, where the file is located.
6. Double-click **ACME\_Analysis\_File.xls** to open the file.
7. At the bottom, click the **SPY** tab.
8. In cell **B86**, change the value to **110.536**.
9. In cell **B91**, change the value to **93.536**.
10. Select cells **A85** to **D105**.
11. From the ribbon, click **Insert**.
12. In the **Charts** section, click **Column Chart**, and then select **3-D Column**.
13. Click **File > Save As > Computer > Documents > Zimnix**, and then save the file with the name **ACME ROI proposal v1**.
14. Click **Save**.

## EDIT A 55.4-MB PRESENTATION IN MICROSOFT® POWERPOINT®

1. Keep Excel open from the previous process.
2. From the taskbar, click the PowerPoint icon to open PowerPoint.
3. Click **Open Other Presentations**, and then click **OneDrive**.
4. Click **Browse**, and then double-click the **Haytone\_Shared** folder, where the file is located.
5. Double-click **SalesProposalPPTTemplate.ppt**.
6. Click slide 3.
7. From the ribbon, click **Insert**.
8. In the **Images** section, click **Picture**.
9. Double-click **Zimnix\_Services.png**.
10. Switch to Excel.
11. Select the **ACME ROI proposal v1** chart created in “Edit a 26.5-MB spreadsheet in Excel.”
12. Press **Ctrl + C** to copy the chart.
13. Switch to PowerPoint.
14. Click slide 4.
15. Press **Ctrl + V** to paste the chart into PowerPoint.
16. Click slide 5.
17. From the ribbon, click **Insert**.
18. In the **Media** section, click **Video**, and then select **Video on My PC**.
19. Click **Documents > Zimnix**, and then double-click **ServicesVideo.mp4** to add the video to the slide.
20. Click slide 7, scroll to the end of the presentation, and then hold **Shift** and click the last slide.
21. Press **Delete** to delete the slides.
22. Click **File > Save As > Computer > Documents > Zimnix**, and then type **AcmePresentation** as the file name and click **Save**.
23. Close PowerPoint.
24. Close Excel.

## SEND AN EMAIL WITH MICROSOFT® OUTLOOK®

1. From the taskbar, click the Outlook icon to open Outlook.
2. Click **New Email**.
3. In the **To** field, type **ted@zimnix.com** (note this is a fictitious address).
4. In the **Subject** field, type **Confirm Appointment**.
5. In the body, type **Just confirming our appointment tomorrow morning at 9 a.m.**
6. Click **Send**.
7. Close Outlook.

## SEND A 19-MB ATTACHMENT IN AN EMAIL USING OUTLOOK

1. From the taskbar, click the Outlook icon to open Outlook.
2. Click **New Email**.
3. In the **To** field, type **ted@zimnix.com**.
4. In the **Subject** field, type **For your review**.
5. In the body, type **Please let me know if you want to discuss any changes**.
6. Click **Attach File**.
7. Click **Documents**.
8. Select **ACME proposal letter v1.docx**, and then click **Insert**.
9. Click **Attach File**.
10. Select **AcmePresentation.ppt**, and then click **Insert**.
11. Click **Send**.

## USE MULTIPLE APPS AT THE SAME TIME USING MICROSOFT OFFICE 2013

1. From the taskbar, click the Word icon to open Word.
2. Click **Open Other Documents**.
3. Click **OneDrive**.
4. Click **Browse**.
5. Double-click the **Haytone\_Shared** folder where the document is located.
6. Double-click **Business Proposal template.doc**.
7. In the **To** field, change the company name to **ACME**.
8. In the **From** field, type **Bob Thompson**.
9. Change the date.
10. In the **RE** field, change the company name to **ACME**.
11. On last page, in the **Fee** field, type **\$25,000**.
12. On last page, in the **Our team** field, type **Bob Thompson**.
13. Click **File > Save As > Computer > Documents**, and then save the file with the new name **ACME proposal letter v1**.
14. Click **Save**.
15. From the taskbar, click the Excel icon to open Excel.
16. Click **Open Other Workbooks**.
17. Click **OneDrive**.
18. Click **Browse**.
19. Double-click the **Zimnix** folder where the file is located.

20. Double-click **ACME\_Analysis\_File.xls**.
21. At the bottom, click the **SPY** tab.
22. In cell **B86**, change the value to **110.536**.
23. In cell **B91**, change the value to **93.536**.
24. Select cells **A85** to **D105**.
25. From the ribbon, click **Insert**.
26. In the Charts section, click **Column Chart**, and select **3-D Column**.
27. Click **File > Save As > Computer > Documents > Zimnix**, and then save the file with the name **ACME ROI proposal v1**.
28. Click **Save**.
29. From the taskbar, click the PowerPoint icon to open PowerPoint.
30. Click **Open Other Presentations**.
31. Click **OneDrive**.
32. Click **Browse**.
33. Double-click the **Haytone\_Shared** folder where the file is located.
34. Double-click **SalesProposalPPTTemplate.ppt** to open.
35. Click slide 3.
36. From the ribbon, click **Insert**.
37. In the **Images** section, click **Picture**.
38. Double-click **Zimnix\_Services.png** to insert it into PowerPoint.
39. Switch to Excel.
40. Select the **ACME ROI proposal v1** chart created in previously.
41. Press **Ctrl + C** to copy the chart.
42. Switch to PowerPoint.
43. Click slide 4.
44. Press **Ctrl + V** to paste the chart into PowerPoint.
45. Click slide 5.
46. From the ribbon, click **Insert**.
47. In the **Media** section, click **Video**, and then select **Video on My PC**.
48. Click **Documents > Zimnix**, and then double-click **ServicesVideo.mp4** to add the video to the slide.
49. Click slide 7, scroll to the end of the presentation, and then hold **Shift** and click the last slide.
50. Press **Delete** to delete the slides.
51. Click **File > Save As > Computer > Documents > Zimnix**, and then **AcmePresentation** as the file name and click **Save**.
52. From the taskbar, click the Outlook icon to open Outlook.
53. Click **New Email**.
54. In the **To** field, type **ted@zimnix.com** (note this is a fictitious address).
55. In the **Subject** field, type **Confirm Appointment**.
56. In the body, type **Just confirming our appointment tomorrow morning at 9 a.m.**
57. Click **Send**.
58. Click **New Email**.
59. In the **To** field, type **ted@zimnix.com**.

60. In the **Subject** field, type **For your review.**
61. In the body, type **Please let me know if you want to discuss any changes.**
62. Click **Attach File.**
63. Click **Documents.**
64. Select **ACME proposal letter v1.docx**, and then click **Insert.**
65. Click **Attach File.**
66. Select **AcmePresentation.ppt**, and then click Insert.
67. Click **Send.**

TAKE NOTES IN MICROSOFT® ONENOTE® (ON THE HP ELITE X2 1012 G1, COMPLETE THESE STEPS ONCE USING A PEN AND ONCE USING TOUCH)

1. From the taskbar, click the OneNote icon to open OneNote.
2. Type **Meeting notes: Went well, need to update proposal to include new sale.**
3. Close OneNote.

COMPLETE A VIDEO CALL AND SEND A 19-MB ATTACHMENT IN MICROSOFT® SKYPE® FOR BUSINESS

1. From the taskbar, click the Skype for Business icon to open Skype for Business.
2. Double-click the contact that you wish to call.
3. Click the video-call icon.
4. Click **Start My Video** to start a call.
5. Angle the embedded camera for the best view.
6. Click the **Present** icon, and then add attachments by clicking the paperclip icon and following the prompts.
7. Click **Documents**, and then double-click the **Zimnix** folder.
8. Double-click **SalesPDF.pdf**.
9. End the call and then close Skype for Business.

ENLARGE A 113-MB ADOBE® PHOTOSHOP® FILE (WITH 3D ELEMENTS)

1. Open Photoshop by double-clicking the app icon.
2. Click **File > Open > Documents > Zimnix**, and then open **Test\_Photoshop\_File3.psd**.
3. From the **Image** menu, select **Image size**.
4. In the **Percentage** field, type **300**.
5. Click **OK**.
6. Wait for the image to resize.
7. Close Photoshop.

ENLARGE A 109-MB PHOTOSHOP FILE (WITHOUT 3D ELEMENTS)

1. Open Photoshop by double-clicking the app icon.
2. Click **File > Open > Documents > Zimnix**, and then open **Test\_Photoshop\_File3.psd**.
3. From the **Image** menu, select **Image size**.
4. Change **Pixels** to **Percentage**.
5. In the **Percentage** field, type **300**.
6. Click **OK**.
7. Wait for the image to resize.
8. Close Photoshop.

## MOVE 3D ELEMENTS IN 129-MB ADOBE® ILLUSTRATOR® FILE

1. Open Illustrator by double-clicking the app icon.
2. Click **File > Open > Documents > Zimnix**, and then open **Test\_Illustrator\_3d\_File.ai**.
3. Click and drag to select all 3D items.
4. Press the down-arrow key 10 times, and then start the timer.
5. Click outside the selected area.
6. Stop the timer when all items are deselected.

## ENCODE A 14.3-MB VIDEO FILE

1. Open Adobe® After Effects® by double-clicking the app icon.
2. Click **Open Project > Documents > Zimnix**, and then open **Prowess Intel Octoblu CC 2014.aep**.
3. Click **Composition**, and then select **Add to Adobe Media Encoder Queue**.
4. Click the green arrow for **Adobe Media Encoder** to start encoding.
5. Wait for the video to encode.

Use Case Results					
Use Case	HP® Elite x2 1012 G1 with an Intel® Core™ m5-6Y54 Processor	HP® EliteBook® 840 G3 with an Intel Core i5-6200U Processor		<b>Comparison:</b> Difference Using Wireless on HP Elite x2 1012 G1 Compared to HP EliteBook 840 G3	<b>Comparison:</b> Difference on HP EliteBook 840 G3 on Wireless Compared to Ethernet
	Wireless	Wireless	Ethernet		
<b>Log on to the device</b>	3.80 sec	2.00 sec	2.00 sec	1.80 sec slower	0
<b>Browse to and download a 20-MB file from the Internet with Internet Explorer®</b>	73.60 sec	74.00 sec	71.50 sec	0.40 sec faster	2.50 sec slower
<b>Browse to and download a 20-MB file from the Internet with Google Chrome™</b>	71.40 sec	69.60 sec	69.80 sec	1.80 sec slower	0.20 sec faster
<b>Edit a 20-MB photo in Microsoft® Paint</b>	53.10 sec	55.50 sec	49.60 sec	2.40 sec faster	5.90 sec slower
<b>Edit a 19-MB file in Adobe® Acrobat® Reader®</b>	68.20 sec	71.50 sec	66.40 sec	3.30 sec faster	5.10 sec slower
<b>Total Microsoft® Office 2013 tasks</b>	285.30 sec	264.60 sec	252.80 sec	20.70 sec slower	11.80 sec slower
<b>Edit a basic 28.7-KB Microsoft® Word file</b>	66.00 sec	63.30 sec	58.50 sec	2.70 sec slower	4.80 sec slower
<b>Edit a 26.5-MB spreadsheet in Microsoft® Excel®</b>	57.40 sec	56.40 sec	61.60 sec	1.00 sec slower	5.20 sec faster
<b>Edit a 55.4-MB presentation in Microsoft® PowerPoint®</b>	62.50 sec	58.20 sec	57.80 sec	4.30 sec slower	0.40 sec slower
<b>Send an email using Microsoft® Outlook®</b>	27.60 sec	29.80 sec	24.40 sec	2.20 sec faster	5.40 sec slower
<b>Send a 19-MB attachment on an email using Outlook</b>	65.70 sec	58.10 sec	51.70 sec	7.60 sec slower	6.40 sec slower
<b>Use multiple apps at the same time in Microsoft Office 2013</b>	294.50 sec	253.60 sec	236.40 sec	40.90 sec slower	17.20 sec slower
<b>Edit a basic 28.7-KB Word file</b>	62.20 sec	56.70 sec	57.10 sec	5.50 sec slower	0.40 sec faster
<b>Edit a 26.5-MB spreadsheet in Excel</b>	55.00 sec	57.70 sec	50.00 sec	2.70 sec faster	7.70 sec slower

<b>Edit a 55.4-MB presentation in PowerPoint</b>	59.30 sec	55.80 sec	52.70 sec	3.50 sec slower	3.10 sec slower
<b>Send an email using Outlook</b>	24.60 sec	26.40 sec	20.80 sec	1.80 sec faster	5.60 sec slower
<b>Send a 19-MB attachment on an email using Outlook</b>	63.70 sec	58.00 sec	55.60 sec	5.70 sec slower	2.40 sec slower
<b>Take notes in Microsoft® OneNote® (using a pen for the HP Elite x2 1012 G1)</b>	27.30 sec	21.30 sec	15.10 sec	6.00 sec slower	6.20 sec slower
<b>Take notes in OneNote (using touch for the HP Elite x2 1012 G1)</b>	25.40 sec	21.30 sec	15.10 sec	4.10 sec slower	6.20 sec slower
<b>Complete a video call and send a 19-MB attachment in Microsoft® Skype® for Business</b>	116.90 sec	117.00 sec	105.50 sec	0.10 sec faster	11.50 sec slower
<b>Enlarge a 113-MB Adobe® Photoshop® file (with 3D elements)</b>	113.83 sec	118.92 sec	Not Applicable (NA)	5.09 sec faster	NA
<b>Enlarge 109-MB Photoshop file (without 3D elements)</b>	117.56 sec	73.93 sec	NA	43.63 sec slower	NA
<b>Move 3D elements in a 129-MB Adobe® Illustrator® file</b>	49.49 sec	52.54 sec	NA	3.05 sec faster	NA
<b>Encode a 14.3-MB Adobe® After Effects® video file</b>	127.52 sec	120.51 sec	NA	7.01 sec slower	NA

All times shown are the median of three test runs. Margins of error run from +/-0.5 percent to +/-16.0 percent.

<sup>1</sup> Results have been estimated or simulated using internal Intel analysis or architecture simulation or modeling, and provided to you for informational purposes. Any differences in your system hardware, software or configuration may affect your actual performance.

<sup>2</sup> Wikipedia. "Jaguar AJ-V6 engine." [https://en.wikipedia.org/wiki/Jaguar\\_AJ-V6\\_engine](https://en.wikipedia.org/wiki/Jaguar_AJ-V6_engine).

<sup>3</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark® and MobileMark®, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit [www.intel.com/performance](http://www.intel.com/performance). Configuration details:

Intel® Core™ i5-6200U processor (2.3 GHz base up to 2.8 GHz, 4 threads, 2 cores, 3 MB cache, 15 W TDP), on Motherboard: CRB, BIOS: Intel X021, Graphics: Intel® HD Graphics Driver 20.19.15.4377, Memory: 1 x Micron 4 GB DDR4 (2,133 MHz), Hard Disk: Seagate® Barracuda ST3100524AS 1 TB 500,000, Operating System: Windows® 10 Pro (x64) TH2, Wireless: On and connected, Resolution: 1,900 x 2,200, System Power Management Policy: AC/Always on.

Intel Core m5-6Y54 processor (1.1 GHz base up to 2.7 GHz, 4 threads, 2 cores, 4 MB cache, 4.5 W TDP), on Motherboard: Intel Whitetip Mountain 1, BIOS: Intel X021, Graphics: Intel HD Graphics Driver 20.19.15.4377, Memory: 2 x Crucial 4 GB CT51264BC160B.16FMR PC3-12800U (1,600 MHz), Hard Disk: Seagate® Momentus ST9500424AS 500 GB 500,000, Operating System: Windows 10 Pro (x64) TH2, Wireless: On and connected, Resolution: 1,900 x 2,200, System Power Management Policy: AC/Always on.



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

Results have been simulated and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

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