

Dell Dock Productivity Study:

Exploring The Effects Of Docks And Connected Peripherals On Worker Productivity



HOTTECH

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ANALYSIS

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A Summary Of Productivity Benefits Offered By Dell Docks

Dell docks help users setup their workspace more than 7 times faster. Dell Docks offer single-cable connectivity to attach all monitors and peripherals, while also charging the laptop. This vastly simplifies the desk setup process and users are able to get to work more quickly.

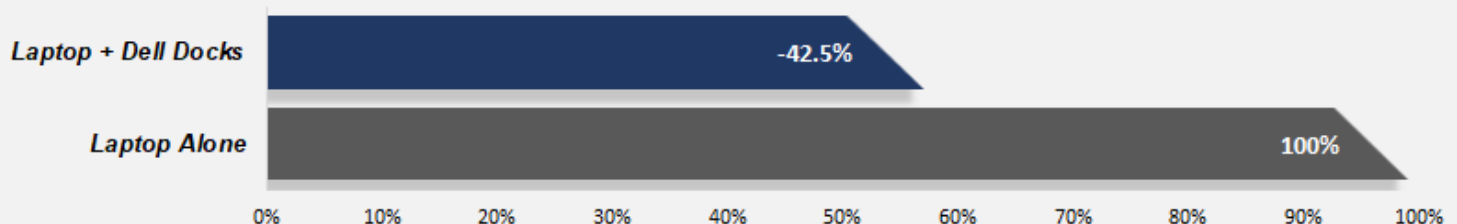
Setup time when connecting peripherals to laptop



Dell Dock users may gain, on average, up to 17 days of additional productive time in an year.

Dell Docks enable users to be more productive by making connectivity to multiple monitors and peripheral possible. Our data showed that users took 42.5% less time to complete an array of tasks with a Dell dock than without.

Average Time Taken To Complete Tasks





Dell Docks, Connected Peripherals And Improving Productivity

Although there has been a consistent increase in the number of remote workers over the last few years, recent global events have significantly accelerated the transition. This transformation of the workforce was already underway, however, and doesn't appear to be temporary. Further, as companies strive to accommodate hybrid home and in-office workforces at corporate locations, stabilizing and streamlining worker PC configurations has become even more critical.

Maximizing productivity while working in different locations can be a challenge for some users who are not accustomed to completing work-related tasks on sub-optimal remote office setups. It is common for on-site workers to have access to powerful, full-sized desktop systems and multiple monitors, but when working from a different location these same users are often relegated to a laptop alone. When users are forced to be productive on relatively small, single laptop displays, with relatively cramped laptop keyboards and touchpads, they often have to make unfortunate trade-offs in their workflow that may hinder productivity. For example, users may have to bounce between open applications and windows, or shrink down application windows to fit alongside each other on a smaller laptop display, which often necessitates additional scrolling, resulting in sub-optimal viewing and ergonomics that can lead to a higher rate of fatigue and errors.

These trade-offs, however, can be mitigated or eliminated altogether by leveraging docks and connected peripherals, such as larger external monitors and dedicated input devices. With accessories and peripherals like these connected to a laptop, users are able to more easily view and navigate multiple applications, simultaneously. Using full-sized input devices and properly positioning monitors can also alleviate many ergonomic issues, which in turn can minimize fatigue and improve long-term wellbeing and morale. But that is only if the laptop has the ports necessary to interface with many devices. Modern laptops have been shipping with fewer and fewer ports. A dock not only expands a laptop's I/O options, but also allows users to charge their laptops while concurrently connecting external peripherals.

For workers to maximize productivity, selecting the right tools is key. While higher-performance system upgrades are often the preferred solution to boost worker productivity, for many users a more powerful system may do very little. Users that spend most of their workday anchored in emails, Word documents, or PowerPoint slides, don't typically place a heavy enough load on a system to realize any significant time-savings during every-day real-world use. However, the user's input devices and monitors, which are the primary human interfaces that workers interact with on a PC, can have an enormous impact on productivity.

For this study, we set out to measure the potential productivity gains that can be realized by leveraging a Dell dock attached to full-sized input devices, such as a keyboard and mouse kit, dual monitors, and various peripherals, attached to an assortment of laptops of various configurations.





How Dell Docking Solutions Can Simplify Setup Improve User Experiences

For some users, the thought of installing and configuring a dock and multiple peripherals may be daunting. However, the reality is that the process is straightforward and can be completed by almost anyone. With modern laptops like Dell's Precision 5500 series and the Dell USB-C monitors featured in this study, anyone capable of plugging-in a power cord and a USB-C cable can be up and running in a matter of minutes.

The installation process for the Dell docks we tested is as simple as connecting them to a power source, plugging in a monitor (or multiple monitors) over a USB-C cable, connecting the monitor's power adapter, and then plugging the dock into the laptop via a single USB-C or Thunderbolt cable. This initial dock setup takes only a few minutes and only needs to be performed once. After that, a single cable connected to the laptop is all that's required and Dell's dock and Windows will take care of the rest. Windows 10 will automatically detect the displays and then it's simply a matter of choosing your desired screen mode, and positioning the hardware to your liking.

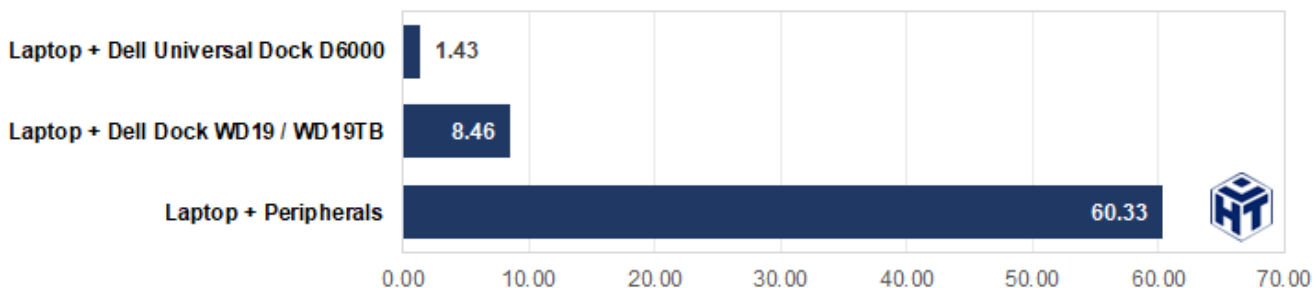
What We Tested: Dell Systems, Input Devices, Docks And Monitors

For this study, five participants of various computing skill levels were tested on eight different system configurations. We attached a variety of peripherals and displays to an array of laptops (full specifications available in **Appendix D**), including a Dell KM7120W Premium Keyboard and Mouse Combo, two Dell UltraSharp 27 4K monitors, and various Dell docking solutions which included Dell's D6000, WD19 and WD19TB docks. In addition, a wired Dell headset and Logitech C920 Pro webcam were attached to all configurations to replicate a configuration that's common for video conferencing purposes. All of the monitors were configured in Extended Desktop mode to maximize available screen real estate, which allowed participants that chose to do so, to use the laptop's internal display in conjunction with the external monitors for applications and web conferencing.

Our goal was to ascertain what potential productivity benefits could be achieved by incorporating full-sized input devices and additional displays that greatly expand screen real estate and provide a multi-desktop user experience. In addition, we wanted to observe how Dell docking solutions facilitated and enabled this productivity gain, both in terms of simplifying setup for end users, as well as maintaining stable, high-bandwidth configurations over wired network connections that docking solutions can enable. Finally, we wanted to measure ease of use via setup time spent by users who had the benefit of utilizing a dock, versus connecting all peripherals and displays individually. Our first set of user configuration setup test results are detailed in the chart below.

Average Setup Time Increase Versus Laptop Alone (In Seconds)

Per Configuration Average Of All Participants
Lower Score = Short Time / Better Result

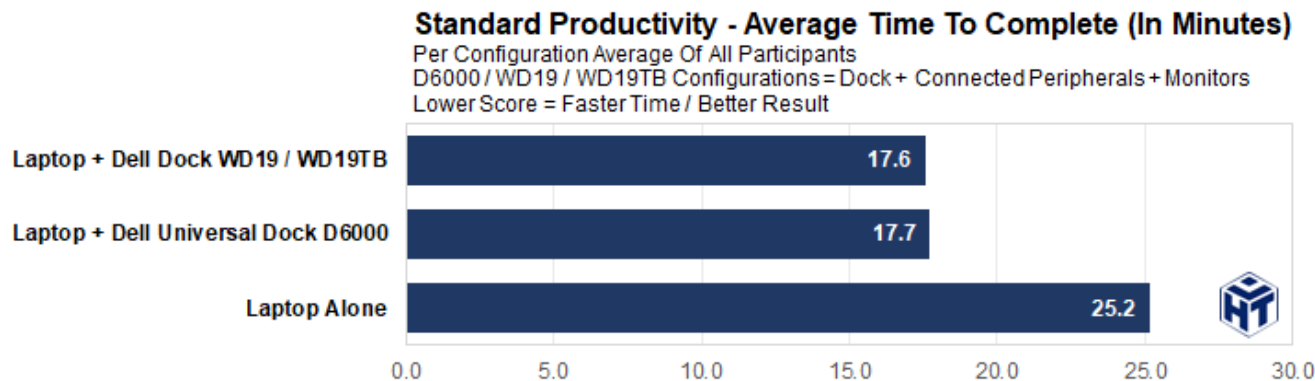


Connecting the laptop to either Dell dock added only seconds to the overall setup time, once the system had been initially preconditioned with the necessary drivers. Conversely, individually plugging in peripherals added over a minute (on average) which can add up to significant time wasted over the course of a month or year. If a worker packs up his laptop and individually connects peripherals only four times per day, over 17.2 hours, or over two full work days, is wasted in a single year.



Per-Participant Productivity Improvements – Standard Productivity

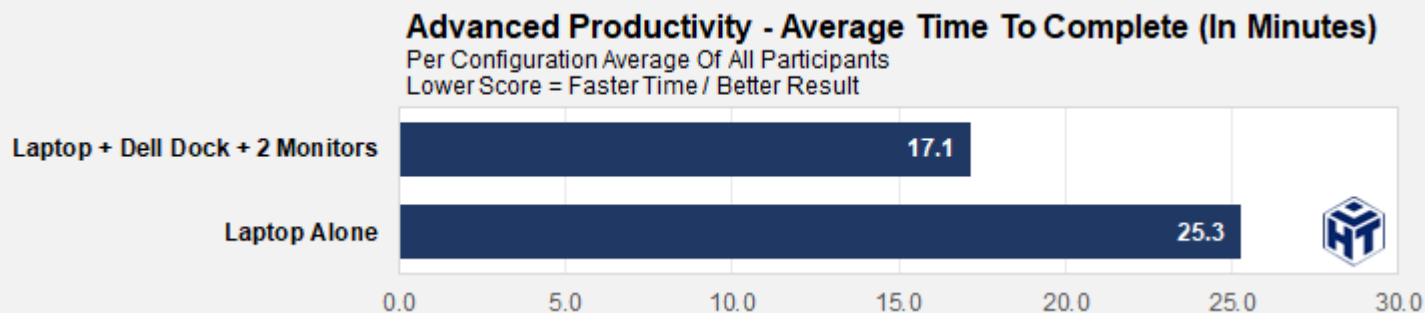
Participants in this study were timed and asked to perform an array of standard productivity tasks using a web browser, image editor, and various Microsoft Office applications, including Word, PowerPoint, and Excel, while video conferencing (*see Appendix B for details*). The test conditions were devised to mimic common business use cases, and necessitate application-switching, scrolling, and multiple Cut, Copy, and Paste operations.



The configurations utilizing the Dell D6000 and WD19 / WD19TB docks featured dual external monitors, in addition to full-sized keyboards and mice, wired Ethernet connections, and a dedicated webcam and headset. When performing similar tasks versus the laptop alone, the participants times improved significantly. On average, participants completed the test over 7.5 minutes faster when utilizing the Dell docks and peripherals.

Per-Participant Productivity Improvements – Advanced Productivity

Participants in this study were also timed and asked to perform a variety of advanced productivity tasks, which leaned more heavily on content creation, using a video and image editors and Microsoft Word, while simultaneously video conferencing (*see Appendix C for details*). The test conditions were devised to mimic a collaborative use case, and require application-switching, video production, and multiple Cut, Copy, and Paste operations.



Using the Dell dock, peripherals, and dual monitors resulted in a significant average time savings and productivity benefit. The average improvement for all participants combined, versus the laptop alone, was 8.2 minutes.

Assuming a worker performs similar tasks four times a day, said worker will gain nearly 33 minutes of additional productive time each day. Factor that time savings over the typical 260 work days of the average worker, and he or she may effectively gain over 17 days of productive time each year.

Additional Productivity And Ergonomic Benefits

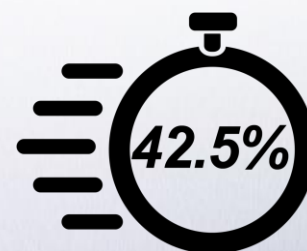
Beyond these observed efficiency gains that resulted in measured time saving for end users, adding monitors and full-sized desktop input devices to a laptop offers a number of additional benefits. Test subjects reported that larger, properly-spaced keys on the external keyboard, and the ability to locate the input devices and monitors in optimal positions, offered clear comfort and ergonomic benefits. In addition, fine-tuning the monitor's height and tilt further enhance comfort and usability. In turn, all of the ergonomic benefits should result in less fatigue over time and enhanced user experiences. An additional benefit of the Dell D6000 dock is that the monitor's arrangement configuration can be deployed by IT administrators. Even users connecting to the workspace for the first time don't have to manually arrange the external monitors inside Windows.

However, what was perhaps more impactful for the classic work-from-home use case of participating in a video conference, while trying to remain productive, is how users reported that a secondary display allowed them to not only stay engaged with the video call, but also multitask and get additional work done simultaneously. Better still, users also reported being able to reference required data for a video call more easily with at least one external display available to work on. Users reported that having an external display could significantly improve their video conference engagement and success rate.

Connecting and configuring the docking solutions in our study was quick and simple as well, relative to legacy docking solutions. USB-C streamlines the installation process and consolidates connections to the laptop into a single cable. The multiple cables required to connect a notebook to peripherals, displays, power and data can all be cleaned up into a single high-speed USB-C Gen 2 or Thunderbolt connection from one of the Dell docks we tested. Furthermore, the initial setup for peripherals and displays only needs to be performed once, and then it's as simple as plugging in one cable from the dock to the laptop. And an additional benefit for Dell's D6000 dock is that it remembers monitor arrangement from its last settings, maintaining these preferences in the Windows environment so users can get up and running that much quicker.

Finally, the Dell docking solutions we tested all were equipped with RJ45 Gigabit Ethernet network jacks, which enabled a wired connection for the laptops we tested, which would have otherwise had to rely on wireless networking only. During small batch file transfers, an 802.11ac or 802.11ax wireless connection was performant enough to not slow users down. However, when tasked with transferring even a half dozen files of a few hundred megabytes in size, users on wired dock connections experienced a massive 66 percent reduction in transfer times, that over the course of a workday can significantly reduce wait times and enhance productivity even further.

Average time-savings for all participants and upgraded configurations with both standard and advanced productivity workloads:



Appendix A: How We Tested – Setup Times

Laptop Alone

Pre-Configuration: Put the laptop to sleep by closing the lid. Place the laptop and AC adapter inside laptop bag and zip it.

1. Start the timer as the laptop bag is opened
2. Remove the laptop and AC adapter from the laptop bag
3. Connect the AC adapter from the laptop to an open power outlet
4. Open the laptop, wait for it to wake up, and sign in
5. Stop the timer once the Windows desktop appears

Laptop + Monitors and Peripherals

Pre-Configuration: Setup two Dell 4K monitors with power connected. Connect a DisplayPort/Type-C cable to each monitor with the other ends disconnected but ready to plug in. Place the Logitech webcam atop one of the monitors with its USB cable ready to plug in. Place a USB headset on the desk ready to plug in. Place a wireless keyboard and mouse on the desk, with the USB dongle ready to be connected. Put the laptop to sleep by closing the lid. Place the laptop and AC adapter inside laptop bag and zip it.

1. Start the timer as the laptop bag is opened
2. Remove the laptop and AC adapter from the laptop bag
3. Connect the AC adapter from the laptop to an open power outlet
4. Connect the monitors and all peripherals to the laptop
5. Open the laptop, wait for it to wake up, and sign in
6. Once the Windows desktop appears, verify the monitors are arranged correctly. If they are not, go to Settings > Display if necessary, to correct the arrangement. Stop the timer.

Laptop + WD19 / WD19TB Dock with Connected Peripherals

Pre-Configuration: Setup the WD19 dock on the desk connected to a power source. Setup two Dell 4K monitors. Connect each monitor to the WD19 dock using a DisplayPort/Type-C cable*. Place the Logitech webcam atop one of the monitors and the USB headset and keyboard and mouse on the desk. Connect all via USB to the WD19 dock. Put the laptop to sleep by closing the lid. Place the laptop alone inside the laptop bag and zip it.

1. Start the timer as the laptop bag is opened
2. Remove the laptop from the laptop bag
3. Connect WD19 dock using its Thunderbolt 3 cable to a Thunderbolt 3 port on the laptop
4. Press the power button on the WD19 dock to wake the laptop without opening its lid. Sign in.
5. Once the Windows desktop appears, verify the monitors are arranged correctly. If they are not, go to Settings > Display if necessary, to correct the arrangement. Stop the timer.

*The WD19 Docking Station only supports dual 4K 60Hz monitors when one monitor is connected via the Thunderbolt 3 Type-C port and the second monitor is connected via DisplayPort or HDMI

Laptop + Universal D6000 Dock with Connected Peripherals

Pre-Configuration: Setup the D6000 dock on the desk connected to a power outlet**. Setup two Dell 4K monitors. Connect each monitor to the D6000 dock using a DisplayPort cable. Place the Logitech webcam atop one of the monitors and the USB headset and keyboard and mouse on the desk. Connect all via USB to the D6000 dock. Put the laptop to sleep by closing the lid. Place the laptop alone inside the laptop bag and zip it.

1. Start the timer as the laptop bag is opened
2. Remove the laptop from the laptop bag
3. Connect D6000 dock using its Thunderbolt 3 cable to a Thunderbolt 3 port on the laptop
4. The laptop will wake once the Thunderbolt 3 cable is connected. Sign in.
5. Once the Windows desktop appears, verify the monitors are arranged correctly. Go into Settings > Display if necessary, to correct the arrangement. Stop the timer.

**The Universal D6000 dock requires software which should be pre-installed on the laptop and configured before starting.

Appendix B: How We Tested – Standard Productivity

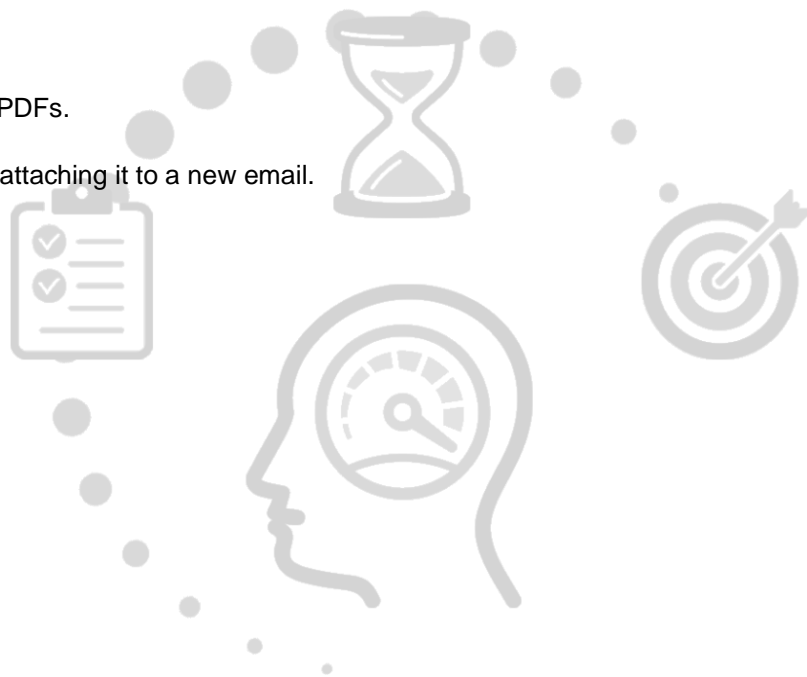
Participants in this study were asked to complete an array of Standard Productivity tasks, while being timed, which involved a web browser, image editor (Microsoft Paint), three Microsoft Office Applications (Word, Excel, and PowerPoint), and a video conference.

In an effort to mitigate any familiarity with the tests and repetition, we created multiple document groups, and randomized their use across the different system configurations that were tested. We also randomized the order in which participants were tested on a particular system configuration. There were an identical number of tasks required to complete the workloads with all document groups, but the order of operations was randomized where possible as well (some steps, like Copying and Pasting an image, must be performed consecutively).

All participants were given a chance to familiarize themselves with the configurations, read the instructions (and ask questions), and get comfortable with the setup before the timer was started. Participants were also given the option as to where applications were positioned on-screen and the displays and input devices were positioned for maximum comfort as well.

The testing for the Standard Productivity workloads included:

- 1) Copying a ZIP file from shared, network-attached storage to the laptop.
- 2) Engaging in a mock video conference.
- 3) Extracting Word, Excel, and PowerPoint files from the .ZIP and saving them to the desktop.
- 4) Copying thousands of rows of data from multiple columns in Excel (data locations were randomized).
- 5) Pasting the data from Excel onto different tabs, to auto-generate multiple charts.
- 6) Ascertaining the Chart Titles from the Word And PowerPoint files (locations in the documents were randomized).
- 7) Copying the completed charts and saving them as image files.
- 8) Inserting the charts into the Word and PowerPoint files (locations in the documents randomized).
- 9) Editing font and layout attributes of the Word file (font and margin sizes randomized).
- 10) Duplicating and editing slides in PowerPoint.
- 11) Exporting the Word and PowerPoint documents to PDFs.
- 12) Creating a .ZIP file with completed documents and attaching it to a new email.



Appendix C: How We Tested – Advanced Productivity

The testing process and workflow for the Advanced Productivity testing was similar to the Standard Productivity tests (outlined in **Appendix B**), but utilized more complex and advanced, content creation workloads.

Participants were required to create and edit a single video from multiple smaller clips and individual images, while simultaneously acquiring data from a mock video conference / collaboration, and documenting the steps to confirm completion along the way.

All participants were given a chance to familiarize themselves with the configurations, read the instructions (and ask questions), and get comfortable with the setup before the timer was started. Participants were also given the option as to where applications were positioned on-screen and the displays and input devices were positioned for maximum comfort as well.

The testing for the Advanced Productivity workloads included:

1. Copying files from an external USB solid state drive to the laptop.
2. Engaging in a mock video conference.
3. Importing video clips into Cyberlink PowerDirector (order of clips randomized).
4. Acquiring images from the video conference for insertion into the video (timing for capturing images randomized).
5. Applying transitions between video clips (transitions types randomized).
6. Inserting Title and Ending text into video overlaps (wording randomized).
7. Applying various video enhancements to the entire video (type and order of enhancements randomized).
8. Documenting the completion of multiple steps in a separate notes document.
9. Encoding the completed video.
10. Creating a single ZIP file with completed video and notes document.
11. Copying final ZIP file from the laptop to an external solid state drive.



Appendix D: Test System And Device Specifications

	Dell UltraSharp 27 4K USB-C Monitor: U2720Q	Dell UltraSharp 27 4K USB-C Monitor: U2720Q	Dell UltraSharp 27 4K Monitor: U2718Q	Dell UltraSharp 27 4K Monitor: U2718Q
Diagonal Viewing Size:	68.58 cm (27 inches)	68.58 cm (27 inches)	68.58 cm (27 inches)	68.58 cm (27 inches)
Panel Type:	In-Plane Switching	In-Plane Switching	In-Plane Switching (HDR)	In-Plane Switching (HDR)
Maximum Preset Resolution:	3840 x 2160 @ 60Hz	3840 x 2160 @ 60Hz	3840 x 2160 @ 60Hz	3840 x 2160 @ 60Hz
Viewing Angle:	178° vertical / 178° horizontal	178° vertical / 178° horizontal	178° vertical / 178° horizontal	178° vertical / 178° horizontal
Connectivity:	1 x DisplayPort 1 x HDMI 2 x USB-C 2 x USB 3.0 downstream 1 x USB 3.0 1 x Audio line-out	1 x DisplayPort 1 x HDMI 2 x USB-C 2 x USB 3.0 downstream 1 x USB 3.0 1 x Audio line-out	1 x DP (ver. 1.4) 1 x mDP (ver. 1.4) 2 x HDMI (ver. 2.0a) 1 x USB 3.0 port - Upstream 4 x USB 3.0 ports, Including 2 x USB3.0 BC 1.2 charging capability at 2A (max)	1 x DP (ver. 1.4) 1 x mDP (ver. 1.4) 2 x HDMI (ver. 2.0a) 1 x USB 3.0 port - Upstream 4 x USB 3.0 ports, Including 2 x USB3.0 BC 1.2 charging capability at 2A (max)

	External Storage	Webcam	Headset	Input Devices
Peripherals	1TB Samsung T7 Portable SSD (USB-C 3.1 Gen 2 10Gbps)	Logitech C920 Pro Webcam	Dell Sound by Jabra Skype for Business Wired Headset	KM7120W Multi-Device Wireless Keyboard and Mouse (Gray)

	Processor	Memory	Storage	Display	BIOS	Windows Version
Dell Latitude 5410	Core i5-10310U	16GB (DDR4-2666)	256GB NVMe (Micron)	14" FHD (1920x 1080)	v1.0.0	Pro (v1909)

	Processor	Memory	Storage	Display	BIOS	Windows Version
Dell Precision 5550	Core i7-10875H	32GB (DDR4-2933)	512GB NVMe (Micron)	15.6" UHD (3840X2160)	v1.1.3	Pro (v1909)

	Processor	Memory	Storage	Display	BIOS	Windows Version
HP Elitebook 840	Core i5-8250U	4GB (DDR4-2400)	128GB SATA SSD (SanDisk)	14" FHD (1920X1080)	v01.01.07	Home (v1903)



WD19



D6000



Appendix E: Participant Data And Comparisons

Standard Productivity Testing:

Time Testing (Time In Seconds)					
	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Laptop Alone	1626.25	1185.00	1458.75	1422.50	1862.50
Laptop + Dell Dock WD19TB	1168.75	893.75	876.25	1052.50	1288.75
Laptop + Dell Universal Dock D6000	1058.75	926.25	1080.00	1182.50	1072.50
Per Participant Time Savings Versus Laptop Alone (In Seconds)					
	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Laptop + Dell Dock WD19TB	457.50	291.25	582.50	370.00	573.75
Laptop + Dell Universal Dock D6000	567.50	258.75	378.75	240.00	790.00
Per Participant Time Savings Versus Laptop Alone (%)					
	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Laptop + Dell Dock WD19TB	39.14	32.59	66.48	35.15	44.52
Laptop + Dell Universal Dock D6000	53.60	27.94	35.07	20.30	73.66
Average Times - All Participants (In Seconds)					
Laptop Alone	1511				
Laptop + Dell Dock WD19TB	1056				
Laptop + Dell Universal Dock D6000	1064				
Average Time Savings - All Participants (In Seconds) % Avg. Improvement					
Laptop + Dell Dock WD19TB	455.00	43.09			
Laptop + Dell Universal Dock D6000	447.00	42.01		> 42.55%	

Advanced Productivity Testing:

Time Testing (Time In Seconds)					
	Subject 1	Subject 2	Subject 3		
Laptop Alone	1714.00	1560.00	1274.00		
Laptop + Peripherals + 1 Monitor	1288.00	1090.00	928.00		
Laptop + Dell Dock + 2 Monitors	1162.00	1030.00	892.00		
Per Participant Time Savings Versus Laptop Alone (In Seconds)					
	Subject 1	Subject 2	Subject 3		
Laptop + Peripherals + 1 Monitor	426.00	470.00	346.00		
Laptop + Dell Dock + 2 Monitors	552.00	530.00	382.00		
Per Participant Time Savings Versus Laptop Alone (%)					
	Subject 1	Subject 2	Subject 3		
Laptop + Peripherals + 1 Monitor	33.07	43.12	37.28		
Laptop + Dell Dock + 2 Monitors	47.50	51.46	42.83		
Average Times - All Participants (In Seconds)					
Laptop Alone	1516				
Laptop + Peripherals + 1 Monitor	1102				
Laptop + Dell Dock + 2 Monitors	1028				
Average Time Savings - All Participants (In Seconds) % Avg. Improvement					
Laptop + Peripherals + 1 Monitor	414.00	37.57			
Laptop + Dell Dock + 2 Monitors	488.00	47.47		> 42.52%	

Appendix E: Participant Data And Comparisons (Continued)

Setup Times:

Time Testing (Time In Seconds)					
	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Laptop Alone	32.4	27.35	23.1	23.07	36.45
Laptop + Peripherals	91	92	82	88	91
Laptop + Dell Dock WD19TB	44.93	50.93	31.66	26.36	30.81
Laptop + Dell Universal Dock D6000	29.94	31.2	18.47	21.24	48.68
Per Participant Time Increase Versus Laptop Alone (In Seconds)					
	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Laptop + Peripherals	58.60	64.65	58.90	64.93	54.55
Laptop + Dell Dock WD19TB	12.53	23.58	8.56	3.29	-5.64
Laptop + Dell Universal Dock D6000	-2.46	3.85	-4.63	-1.83	12.23
Average Setup Times - All Participants (In Seconds)					
Laptop Alone	28.47				
Laptop + Peripherals	88.80				
Laptop + Dell Dock WD19TB	36.94				
Laptop + Dell Universal Dock D6000	29.91				
Laptop + Dell Universal Dock D6000*	25.21				
(* outlier omitted)					
Average Time Increase Versus Laptop Alone - All Participants (In Seconds)					
Laptop + Peripherals	60.33				
Laptop + Dell Dock WD19TB	8.46				
Laptop + Dell Universal Dock D6000	1.43				



About Hot Tech Vision and Analysis

Industry Research: With decades of experience in the computing, communications, and semiconductor markets, both at the executive level and as media, HTVA has direct insight into industry trends, forecasts, product execution, and market impact. From whitepaper research data, event coverage, or live speaking engagements on TV, Radio, and Internet channels, our team provides specific, targeted analysis on the hottest technologies that shape the digital landscape. We cover emerging and mature markets within Computing and Semiconductor technologies, but always maintain a pulse on the cutting-edge.

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