The science behind the report:

Spend less time on Windows PC migrations with Dell Migrate

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Spend less time on Windows PC migrations with Dell Migrate.

We concluded our hands-on testing on July 21, 2020. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on June 29, 2020 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

We tested data file migration times on three representative older laptops. For the data reported in the body of the report, we excluded the highest and lowest data file migration times, and we used the middle results (from the Dell Latitude™ 5491) to represent the "Older Windows PC".

Table 1: Results of our data file migration testing (hh:mm).

Source laptop	Dell™ Migrate migrating to Dell XPS	EaseUS Todo PCTrans Pro migrating to Dell XPS	Lenovo® Migration Assistant migrating to Lenovo Thinkpad®	Laplink PCmover Professional migrating to Dell XPS
Dell Latitude 5491	0:50	1:45	2:06	2:55
Dell Inspiron™ 5570	1:07	2:01	2:15	3:26
HP zBook 15u G6	0:45	1:28	1:39	2:21

Table 2: The migration tool capabilities we investigated.

Categories		Dell Migrate	EaseUS Todo PCTrans Pro	Lenovo Migration Assistant	Laplink PCmover Professional
Licensing	Use with multiple source systems without purchasing an additional license	✔	✘	✔	✘
Migration usability and UX	User can continue using the system during the migration	✔	✔	✔	✔
	Users can select the files they want to migrate	✔	✔	✔	✔
	Users can select settings they want to migrate	✔	✔	✔	✔
Migration transfer and security	Transfers data over Wi-Fi	✔	✔	✔	✔
	Uses TLS encryption	✔	✘	✘	✘
Browser bookmarks	Transfers bookmarks from Chrome, Firefox, and Edge	✔	✘	✘	✘
User directories and data	Users can select which folders and files to transfer	✔	✔	✔	✔
	Transfers data from external drives	✔	✔	✘	✘
	Migrated folders—Personal files				
	Downloads	✔	✔	✔	✔
	Pictures	✔	✔	✔	✔
	Video	✔	✔	✔	✔
	Documents	✔	✔	✔	✔
	Music	✔	✔	✔	✔
	Desktop	✔	✔	✔	✔
	Migrated folders—System and application data				
	Root of C	✔	✔	✔	✔
	App data	✘	✔	✘	✔
	Windows	✘	✔	✘	✔
	Program files	✘	✔	✘	✔
	Program files (x86)	✘	✔	✘	✔
Regional settings	User locale - region	✔	✘	✘	✘
	First day of week	✔	✘	✘	✘
	Time zone	✘	✘	✔	✘

On each source system, we distributed packets containing 35.4 MB of data in each of the personal and system migrated folders locations listed above. That 35.4MB packet contained a Word document, a PowerPoint, an image, an Excel spreadsheet, a music file, a database file, and a sub-folder called Test that included a second copy of everything listed above. We also placed a 100GB packet comprised of the above data multiplied many times in the Documents folder. Before we started each migration, we deselected files in the 100GB packet so that the each migration scenario transferred a standardized 100 GB of data—no matter where they pulled that information from.

Categories		Dell Migrate	EaseUS Todo PCTrans Pro	Lenovo Migration Assistant	Laplink PCmover Professional
Input device options	Taskbar settings - taskbar locations and behavior	✔	✘	✘	✘
	Mouse control panel settings	✔	✘	✘	✘
	Keyboard control panel settings	✔	✘	✘	✘
	Sound control panel settings	✔	✘	✘	✔
Accessibility options	Use Toggle Keys	✔	✘	✘	✘
	Use Sticky Keys	✔	✘	✘	✘
	Color filters - red-green (red weak, protanopia)	✔	✘	✘	✔
	High contrast mode	✔	✘	✔	✘

System configuration information

Table 3: Detailed information on the target systems we tested.

Laptop configuration information	Dell XPS 13 9300	Lenovo ThinkPad L14 G1
Processor		
Vendor	Intel®	Intel
Name	Core® i7-1065G7	Core i7-10510U
Core frequency (GHz)	1.30	1.80
Number of cores	4	4
Cache (MB)	8	8
Memory		
Amount (GB)	8	8
Type	DDR	DDR4
Speed (MHz)	3,733	2,667
Graphics		
Vendor	Intel	Intel
Model number	Iris® Plus Graphics	Intel UHD Graphics
Storage		
Vendor	KIOXIA	Samsung®
Model Number	KBG40ZNS256G	MZVLB256HBHQ-000L7
Amount (GB)	256	256
Type	M.2 NVMe™ SSD	M.2 NVMe SSD
Connectivity/expansion		
Wired internet	1 X 1 GbE	1 X 1 GbE
Wireless internet	Killer™ Wi-Fi 6 AX1650 (2x2)	Intel Wi-Fi 6 AX200 160MHz
Bluetooth	5.1	5.0
USB	2 x Thunderbolt 3 1 x microSD Card Reader	1 x USB-C® Gen 1 1 x USB-C Gen 2 2 x USB 3.1 Gen 1
Video	1 x Thunderbolt 3	1 x HDMI 1.4
Battery		
Type	Lithium-Ion	Lithium-Ion
Rated capacity (mAh)	2,600	2,250
Display		
Size (in.)	13.4	14
Type	FHD	FHD
Resolution	1,920 x 1,200	1,920 x 1,080
Touchscreen	No	No

Laptop configuration information	Dell XPS 13 9300	Lenovo ThinkPad L14 G1
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 10 Professional	Windows 10 Professional
Build number or version	10.0.18363	10.0.18363
BIOS		
BIOS name and version	Dell Inc 1.0.11	Lenovo 1.02
Dimensions		
Height (in)	0.58	0.8
Width (in)	11.6	9.3
Depth (in)	7.8	13.0
Weight (lbs.)	2.7	3.6

Table 4: Detailed information on the source systems we tested.

Laptop configuration information	Dell Latitude 5491	Dell Inspiron 5000 Series P75F	HP ZBook 15u G6
Processor			
Vendor	Intel	Intel 40SLKP2	Intel
Name	Celeron N4000	Core i7-8550U	Core i7-8665U
Core frequency (GHz)	1.1–2.6	1.80	1.90
Number of cores	2	4	4
Cache (MB)	4	8	8
Memory			
Amount (GB)	4	8	16
Type	DDR4	DDR4	DDR4
Speed (MHz)	2,400	2,400	2,400
Graphics			
Vendor	Intel	Intel	Intel
Model number	UHD Graphics 600	UHD Graphics 620	UHD Graphics 620
Storage			
Vendor	SanDisk	SK Hynix	Western Digital
Model number	DA4064	SC311	SN720 SDAPNTW
Amount (GB)	64	256	512
Type	eMMC	M.2 SATA SSD	NVMe SSD

Laptop configuration information	Dell Latitude 5491	Dell Inspiron 5000 Series P75F	HP ZBook 15u G6
Connectivity/expansion			
Wired internet	1 x 1 GbE Ethernet	1 x 1 GbE Ethernet	1 x 1 GbE Ethernet
Wireless internet	Intel Dual Band Wireless-AC 7265 IEEE 802.11a/b/g/n/ac	Qualcomm QCA9377 802.11 AC Wireless Adapter	Intel Wireless-AC 9560
Bluetooth	4.2	4.1	5.0
USB	1 x USB 2.0 1 x USB 3.0	2 X USB 2.0	2 x USB 2.0 1 x USB-C
Video	1 x HDMI	1 x HDMI	1 x HDMI
Battery			
Type	Lithium-Ion	Lithium-Ion	Lithium-Ion
Rated capacity (mAh)	3,320	2,154	3,250
Display			
Size (in.)	14	15	15.6
Type	FHD	FHD	FHD
Resolution	1,366 x 738	1,920 x 1,080	1,920 x 1,080
Touchscreen	No	No	No
Operating system			
Vendor	Microsoft	Microsoft	Microsoft
Name	Windows 10 Professional	Windows 10 Professional	Windows 10 Professional
Build number or version	10.0.18362	10.0.18362	10.0.18362
BIOS			
BIOS name and version	HP 01.05.03	Dell Inc. 1.2.3	HP R70 01.05.03
Dimensions			
Height (in)	0.8	0.9	0.7
Width (in)	13.1	15.0	14.6
Depth (in)	9.0	10.2	9.9
Weight (lbs.)	3.6	4.9	3.9

How we tested

Testing overview

We completed and recorded data file migration times with each migration tool between each source and target laptop. For the Dell Migrate, Laplink PCmover Professional, and EaseUS Todo PCTrans Professional testbeds, our target laptop was the Dell XPS 13 9300. For the Lenovo Migration Assistant testbed, our target was the Lenovo ThinkPad L14 G1.

- Dell Migrate testbed
    - First data file migration from the Dell Inspiron P75F to the Dell XPS 13 9300
    - Second data file migration from the Dell Latitude 5491 to the Dell XPS 13 9300
    - Third data file migration from the HP ZBook 15u G6 to the Dell XPS 13 9300

- Laplink PCmover Professional testbed
    - First data file migration from the Dell Inspiron P75F to the Dell XPS 13 9300
    - Second data file migration from the Dell Latitude 5491 to the Dell XPS 13 9300
    - Third data file migration from the HP ZBook 15u G6 to the Dell XPS 13 9300

- Lenovo Migration Assistant testbed
    - First data file migration from the Dell Inspiron P75F to the Lenovo ThinkPad L14 G1
    - Second data file migration from the Dell Latitude 5491 to the Lenovo ThinkPad L14 G1
    - Third data file migration from the HP ZBook 15u G6 to the Lenovo ThinkPad L14 G1

- EaseUS Todo PCTrans Professional testbed
    - First data file migration from the Dell Inspiron P75F to the Dell XPS 13 9300
    - Second data file migration from the Dell Latitude 5491 to the Dell XPS 13 9300
    - Third data file migration from the HP ZBook 15u G6 to the Dell XPS 13 9300

To represent a typical user's data transfer needs, our migration scenarios included a 100GB folder with a variety of the following file types:

- AVI, DB, HTM, JPG, XLS, XLSX, PPT, PPTX, DOC, DOCX, MP3

We also disabled the firewall, notifications, and updates on all laptops. Between tests, we restarted the source laptop and reset the target laptop using the "Remove everything" option in the "Reset this PC" recovery process.

We completed all data transfers over Wi-Fi. To simulate the environment of a consumer completing these migrations, we tested in a home with other wireless networks within range of our laptops. For our testing, we used a TP-Link Wi-Fi 6 AX3000 Smart Wi-Fi Router and configured our environment in the following ways:

- We placed our laptops one meter away from the Wi-Fi router and from each other.
- All systems had direct line of sight to the router with no objects or walls in the way.
- Only the two laptops under test were connected to the Wi-Fi router during testing.
- In the router settings, we disabled the 2.4 GHz band so that our testing only used the 5 GHz band.
- To mitigate interference from other Wi-Fi routers, we manually set a less populated Wi-Fi channel and disabled automatic channel selection.

When we finished setting up the testbeds, we downloaded Wireshark from wireshark.org and used the program to inspect the network traffic between both test devices. To avoid affecting our timed results, we did this via their wireless interface during transfers. We completed this inspection before we started testing.

We also verified that Dell Migrate was the only solution to use TLS (Transport Layer Security) encryption during the migration. We saw no evidence of other network encryption protocols during the transfer. However, we did not determine if other solutions used other types of encryption.

Setting up and using the migration tools

We completed the following tasks multiple times as described in the above section.

Installing Dell Data Assistant

1. On the source laptop, download Dell Data Assistant from https://www.dell.com/en-us/shop/servicesforhome/cp/migrate.
2. Run Dell Data Assistant.exe.
3. Restart the source laptop.

Migrating data files with Dell Migrate

1. On the target laptop, open Dell SupportAssist, which comes pre-installed on the Dell XPS 13 9300.
2. In the Green bar at the top of the screen, next to Would you like to begin moving your files and settings to this PC?, click Yes.
3. On the Welcome to Dell Migrate page, click Dell Get started.
4. On the source laptop, run Dell Data Assistant.
5. On the target system, enter the PIN shown on the source computer.
6. Once the system finishes scanning for files, select Let me choose what to move.
7. Using the menu navigate to the 100GB folder, and select the folder and all subfolders.
8. Simultaneously start the timer and click Start.

We stopped the Dell Migrate migration timer when we saw the migration completion screen.

Installing Laplink PCmover Professional

Complete the following steps on the source and target laptops.

1. Using the download link from the purchase confirmation email.
2. Run pcmover_pro_dl.exe.
3. In the PCmover Professional wizard, click Next.
4. Once the Setup window appears, click Install.
5. In the installation wizard, click Next.
6. Accept the EULA, click Next.
7. Click Next.
8. Click Install.
9. Once the software is installed, launch PCmover Professional, and click Next.
10. On the Validate Serial Number screen, enter the user information and purchased serial number.

Migrating data files with Laplink PCmover Professional

1. On the source laptop, start Laplink PCmover Professional.
2. Click Transfer Between PCs.
3. Click Next.
4. On the target laptop, start Laplink PCmover Professional.
5. Click Transfer Between PCs.
6. Verify that the New PC is correctly identified as (This PC). If correct, click Analyze PC.
7. Select Choose What to Transfer.
8. Click Let Me Choose.
9. Under documents, select the 100GB folder, and click Next.
10. Simultaneously start the timer and click Start Transfer.

We stopped the Laplink PCmover Professional migration timer when we saw the migration completion screen.

Installing EaseUS Todo PCTrans Pro

Complete the following steps on the source and target laptops.

1. Download the installation file from https://www.easeus.com/download/pctrans-free-download.html.
2. Run pctrans_free_installer.exe.
3. In the EaseUS wizard, click Install.
4. Run the EaseUS Todo PCTrans.
5. Click Upgrade to Full Version.
6. Enter the License and Pro license key, and click Enter.
7. Restart laptop.

Migrating data files with EaseUS Todo PCTrans Pro

1. On the source laptop, start Todo PCTrans.
2. Under PC to PC, click PC to PC.
3. On the target laptop, start Todo PCTrans.
4. Under PC to PC, click PC to PC.
5. Type the Password of the source PC, and click Transfer to local PC. Click Connect.
6. Under Files, click Edit.
7. Under This PC, select the 100GB folder.
8. Simultaneously start the timer and click Finish.

We stopped the EaseUS Todo PCTrans Pro migration timer when we saw the migration completion screen.

Installing the Lenovo Migration Assistant

Complete these steps on the source and target laptops.

1. Download the Lenovo Migration Assistant from https://support.lenovo.com/us/en/downloads/ds502567.
2. Run lma21232.exe.
3. In the Setup - Lenovo Migration Assistant window, click Install, and click Finish.
4. Once the software is installed, restart the laptop.

Migrating data files with Lenovo Migration Assistant

1. On the Lenovo Migration Assistant Welcome screen on the source laptop, click Start.
2. On the How do you want to migrate your data? screen in the Lenovo Migration Assistant, select Wi-Fi.
3. On the Select which computer you are currently on screen, select Old computer, and click Next.
4. Verify that you are on the correct Wi-Fi network, and note the PIN.
5. On the Lenovo Migration Assistant Welcome screen on the target laptop, click Start.
6. On the How do you want to migrate your data? screen in the Lenovo Migration Assistant, select Wi-Fi.
7. On the Select which computer you are currently on screen, select New Computer, and click Next.
8. Enter the PIN from the old computer.
9. Select the 100GB folder, and click All.
10. Simultaneously start the timer and click Migrate.

We stopped the Lenovo Migration Assistant migration timer when we saw the migration completion screen.

Migrating Windows personalization options

We configured the Windows personalization options on the source systems prior to testing and validated the accurate transfer of the Windows personalization options on the target systems at the end of the migration process.

Setting the system time

1. On the toolbar, right-click the time, and select Adjust Date/Time.
2. Under Time zone, select (UTC-03:00) City of Buenos Aires.
3. Under additional calendars in the taskbar, select Simplified Chinese (Lunar).
4. Click Date, time, and regional formatting.
5. For Country or Region, select United Kingdom.
6. For Regional format, select, English (United Kingdom)
7. Click Change data formats.
8. On the Change formats screen, change the First day of the week to Friday.

Changing the background settings

1. Right-click the desktop background, and select Personalize.
2. Click an image to set as background.

Changing mouse settings

1. Using Windows search, type and select Mouse settings.
2. Click Additional mouse options.
3. Under Pointer Options, select Show location of pointer when I press the CTRL key.

Changing keyboard settings

1. In Control Panel, select Keyboard properties.
2. For Cursor blink rate, drag the selector all the way to the right (fastest).

Changing sound settings

1. In Windows search, type and select Sound Settings.
2. Under related setting, select Sound control panel.
3. On the Communications tab, select Mute all other sounds.

Adding browser bookmarks

1. Download and install Google Chrome™ from google.com/chrome.
2. Download and install Mozilla Firefox from mozilla.org/en-US/firefox/download
3. In Microsoft Edge, Google Chrome, and Mozilla® Firefox® add bookmarks/favorites from the following sites:
     • Wikipedia.org
     • Youtube.com
     • Twitter.com
4. Install Google Chrome and Mozilla Firefox on the target system.

Changing taskbar settings

1. Use Windows search to find and select Taskbar Settings.
2. Under Taskbar Settings, click all options to on, and change the Taskbar location on screen to top.

Changing toggle keys settings

1. Use Windows search to find and select Toggle Keys.
2. Under Use Toggle Keys, click Use Toggle Keys, for Play a sound whenever you press Caps Lock, Num Lock, or Scroll Lock on.

Changing sticky keys settings

1. Use Windows search to find and select Use Sticky Keys.
2. Under Use Toggle Keys, click Play a sound whenever you press Caps Lock, Num Lock, or Scroll Lock on.

Changing color filters settings

1. Use Windows search to find and select Adjust color filters.
2. Under Use color filters, click Turn on color filters.
3. Select Red-green (red weak, protanopia).

Changing high contrast settings

1. Use Windows search to find and select Turn high contrast on or off.
2. Under Use high contrast, click Turn on high contrast on.

Read the report at http://facts.pt/url2csg ▶

This project was commissioned by Dell Technologies.