



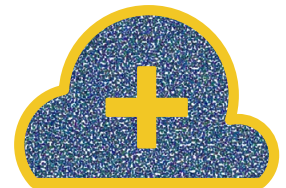
## Minimize interruptions to your schedule from operating system issues

Dell SupportAssist OS Recovery for Dell enterprise laptops offered a more thorough recovery process than HP Sure Recover or Windows-based recovery options for Lenovo enterprise laptops

A laptop operating system (OS) problem can disrupt your day or week by keeping you from being productive. Perhaps more alarming is the risk of losing vital data due to an OS issue. You could spend time recreating files and settings in addition to troubleshooting workarounds. Especially challenging is when a laptop will not boot into the OS itself, ruling out diagnostics tools and software that rely on the OS to run.

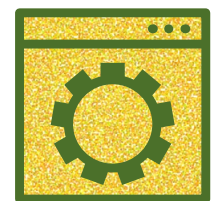
How might you handle a laptop that won't boot into Windows? Even with automated recovery processes for some enterprise laptops, your company's IT help desk may not be able to help you recover lost files and OS customizations. Dell enterprise laptops with BIOSConnect and SupportAssist OS Recovery, however, allow you to recover from OS failure and restore files and settings on your own so you can get back to work quickly.

We compared the features of OS recovery services for three enterprise laptops: Dell SupportAssist OS Recovery for the Dell™ Latitude™ 5500, HP Sure Recover for the HP EliteBook 840 G6, and Windows-based recovery for the Lenovo® Thinkpad® T490. We found that Dell SupportAssist OS Recovery offered more features and a more thorough recovery when faced with certain Microsoft Windows 10 Pro issues and failures. In addition, SupportAssist OS Recovery retained key user data that the other recovery services we tested did not.



### Maintain a recovery lifeline

*Retrieve a Windows 10 Pro image with a wired or wireless connection*



### Reduce data loss from an OS failure

















*Scan and resolve some Windows 10 Pro issues without needing to recover the whole OS and lose vital information*





## Resume your regular workflow with a more thorough recovery process

Enterprise laptops support many applications that you can use to stay productive and connected to your coworkers, including calendars for your schedule and video chat for talking to your team. Because those apps require the OS, OS failures can keep you from using them, potentially causing significant communication and productivity downtime. You may be on your own to troubleshoot and resolve these issues, especially if you're working remotely. If you don't consider yourself tech savvy, handling failures without the face-to-face help of IT support staff may seem overwhelming.

Dell SupportAssist OS Recovery helps you recover from failures and keep data safe even if you don't regularly conduct backups. The service captures user files as part of the recovery process and restores them along with the OS. Restoring the OS thoroughly, including updating drivers as well as restoring user data, could help you get back to videoconferencing or creating your next big presentation rather than spending time searching the internet for file recovery solutions or recreating files that these productivity apps use.

How did the recovery solutions that we tested stack up? Figure 1 compares some key recovery features for the enterprise versions of the Dell Latitude 5500, HP EliteBook 840 G6, and Lenovo ThinkPad T490.

| Feature                  | Dell solution                                                                                                                                                           | HP solution                                                                         | Lenovo solution                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cloud recovery           |   |  |  |
| Software repair          |                                                                                      |  |  |
| OEM data restore         |                                                                                      |  |  |
| BIOSConnect*             |                                                                                      |  |  |
| Post recovery assistance |                                                                                      |  |  |

 Wired  
 Wireless  
 Supported  
 Not supported

\*A Dell proprietary BIOS-based method for utilizing a preboot wireless stack to download a recovery image into RAM.

Figure 1: Key recovery features of the Dell Latitude 5500, HP EliteBook 840 G6, and Lenovo ThinkPad T490 laptops. Source: Principled Technologies.

## What we found

### Recovering Windows 10 Pro from the cloud

The Dell and HP OS recovery solutions for enterprise laptops that we tested offered cloud recovery as part of their recovery services (the Windows-based recovery approach for the enterprise Lenovo ThinkPad T490 didn't offer this feature). Cloud recovery allowed us to restore Windows 10 Pro to a factory state from the latest images on the Dell and HP support clouds. If users can connect to the cloud, they don't need a preloaded USB or second computer to download and create the recovery media to boot to a recovery environment.

We found that after the Dell SupportAssist OS Recovery image loaded, we could either reset to factory settings with a local image or reset and update via the cloud restore option using either a WiFi® or a wired connection. In contrast, the HP EliteBook 840 G6 required a wired connection to access the image in the HP cloud. With the Latitude 5500, users resolving OS failures can restore to a clean OS image from anywhere with WiFi—home, a hotel room, or the office. In contrast, EliteBook 840 G6 users need an Ethernet cable and an Ethernet jack to connect to the HP cloud.

### Scanning and repairing some Windows 10 Pro failures

Restoring a device to the original factory image is a drastic solution, and you may want to avoid it if possible. Dell SupportAssist OS Recovery offered the option to scan and repair hardware and software issues, whereas HP Sure Recovery for the enterprise HP EliteBook 840 G6 and Windows-based recovery for the Lenovo ThinkPad 490 didn't offer similar support. As the SupportAssist OS Recovery environment runs independently of Windows 10 Pro, the Latitude 5500 can scan and repair hardware and Windows 10 Pro issues when the OS won't boot, potentially helping you avoid a total restore.





## Restoring user data without a traditional backup

Of the three recovery services we tested, only Dell SupportAssist OS Recovery helped us avoid losing user data. During a recovery from a failed OS, SupportAssist OS Recovery offered us the option to restore important user data because the storage of the Dell Latitude 5500 was still readable. We selected what we wanted to later restore, and SupportAssist copied the data to a USB. To avoid losing user data with HP Sure Recover or the Windows-based recovery for the Lenovo ThinkPad 490, you must back up user data manually before a restore. So while cloud recovery from both SupportAssist OS Recovery and Sure Recover allowed us to restore the respective laptops to a factory state, returned the device to its pre-failure state. If your laptop's storage is functional during OS issues, not having a recent backup of user data isn't a problem.

Once Dell SupportAssist OS Recovery finished the system restore, the Dell Latitude 5500 prompted us to restore the user data from the USB. Neither HP Sure Recover for the enterprise HP EliteBook 840 G6 nor the Windows-based approach for the Lenovo ThinkPad T490 offered this. If you don't back up your files and settings manually from the enterprise EliteBook 840 G6 or the enterprise ThinkPad T490 before a failure, you could lose them.

## Downloading a factory state of Windows 10 Pro with unreadable storage

Failed or damaged hard drives can present a real threat to files and settings as well as to the functionality of the laptop. In these situations, Dell enterprise laptop users can use BIOSConnect. When the storage of our Dell Latitude 5500 was unreadable, we used BIOSConnect to download SupportAssist OS Recovery. HP Sure Recover and the Windows-based recovery for the Lenovo ThinkPad T490 didn't offer similar features for their respective laptops when the storage was unreadable.

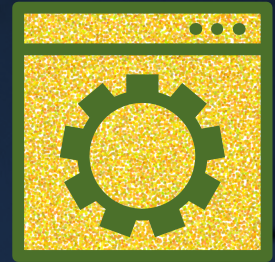
With BIOSConnect, if your enterprise laptop's storage has failed or become corrupt, you can still access all the features of the SupportAssist OS Recovery environment, including OS recovery, system diagnostics, software scan and repair, and virtual customer support to help fix the issues—though with unreadable storage, you cannot retrieve user files or settings.

## Updating, installing, and restoring data, software, and device drivers automatically

After recovering the OS of a laptop, users may find themselves needing to update device drivers and more. Once Dell SupportAssist OS Recovery restored Windows 10 Pro to the Dell Latitude 5500, the enterprise laptop ran Recovery Assistant software to restore user files and settings, install Dell software, and update Windows 10 Pro and Dell drivers. This automatic process can reduce the time you need to locate and download new versions of software and drivers. The HP EliteBook 840 G6 and Lenovo ThinkPad 490 enterprise laptops we tested didn't offer similar features.

## Conclusion

Whether at home or in the office, Dell SupportAssist OS Recovery and BIOSConnect for Dell enterprise laptops can help you get back to work quickly and completely after Microsoft Windows 10 Pro issues, with your valuable data intact. In addition to providing a more thorough recovery process, SupportAssist OS Recovery allowed us to restore user data after recovery for the Dell Latitude 5500 with readable storage—something that neither HP Sure Recover for the HP EliteBook 840 G6 nor the Windows-based recovery for the Lenovo ThinkPad T490 supported.



We concluded our hands-on testing on April 3, 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 March 20, 2020 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

## Our results

Table 1: Key recovery features. Source: Principled Technologies.

| Feature                  | Dell Latitude 5500 w/ Dell SupportAssist OS Recovery and BIOSConnect | HP EliteBook 840 G6 w/ Sure Recover | Lenovo ThinkPad T490 w/ Microsoft Windows-based recovery |
|--------------------------|----------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------|
| Cloud recovery           | Wired or wireless                                                    | Wired only                          | Not supported                                            |
| Software repair          | Supported                                                            | Not supported                       | Not supported                                            |
| OEM data restore         | Supported                                                            | Not supported                       | Not supported                                            |
| BIOSConnect              | Supported                                                            | Not supported                       | Not supported                                            |
| Post recovery assistance | Supported                                                            | Not supported                       | Not supported                                            |

## System configuration information

Table 2: System information. Source: Principled Technologies.

| System                        | Dell Latitude 5500                | HP EliteBook 840 G6               | Lenovo ThinkPad T490              |
|-------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <b>Processor</b>              |                                   |                                   |                                   |
| Vendor                        | Intel®                            | Intel                             | Intel                             |
| Name                          | Core® i7                          | Core i7                           | Core i7                           |
| Model number                  | 8665U                             | 8665U                             | 8665U                             |
| Core frequency (GHz)          | 1.90                              | 1.90                              | 1.90                              |
| Number of cores               | 8                                 | 8                                 | 8                                 |
| Cache                         | 8MB                               | 8MB                               | 8MB                               |
| <b>Memory</b>                 |                                   |                                   |                                   |
| Amount (GB)                   | 16                                | 16                                | 16                                |
| Type                          | PC4-19200                         | PC4-19200                         | PC4-19200                         |
| Speed (MHz)                   | 2,400                             | 2,400                             | 2,400                             |
| <b>Graphics</b>               |                                   |                                   |                                   |
| Vendor                        | Intel                             | Intel                             | Intel                             |
| Model number                  | Integrated UHD 620 Graphics       | Integrated UHD 620 Graphics       | Integrated UHD 620 Graphics       |
| <b>Storage</b>                |                                   |                                   |                                   |
| Amount (GB)                   | 512                               | 512                               | 512                               |
| Type                          | PCIe NVMe SSD                     | PCIe NVMe SSD                     | PCIe NVMe SSD                     |
| <b>Connectivity/expansion</b> |                                   |                                   |                                   |
| Wired internet                | Intel Ethernet Connection I219-LM | Intel Ethernet Connection I219-LM | Intel Ethernet Connection I219-LM |
| Wireless internet             | Intel Dual Band Wireless AC 9560  | None                              | Intel Dual Band Wireless AC 9560  |
| Bluetooth                     | Bluetooth 5.0                     | None                              | Bluetooth 5.0                     |
| USB                           | 1x USB Type C, 3x USB 3.1         | 1x USB Type C, 2x USB 3.1         | 2x USB Type C, 2x USB 3.1         |
| Video                         | 1x HDMI® 1.4                      | 1x HDMI 1.4                       | 1x HDMI 1.4                       |
| <b>Battery</b>                |                                   |                                   |                                   |
| Type                          | 4 Cell                            | 3 Cell                            | 3 Cell                            |
| Rated capacity (Wh)           | 68                                | 50                                | 50                                |
| <b>Display</b>                |                                   |                                   |                                   |
| Size (in.)                    | 15.6                              | 14                                | 14                                |
| Type                          | FHD WVA                           | FHD UWVA                          | FHD IPS                           |
| Resolution                    | 1920 x 1080                       | 1920 x 1080                       | 1920 x 1080                       |
| Touchscreen                   | No                                | No                                | Yes                               |

| System                  | Dell Latitude 5500 | HP EliteBook 840 G6 | Lenovo ThinkPad T490 |
|-------------------------|--------------------|---------------------|----------------------|
| Operating system        |                    |                     |                      |
| Vendor                  | Microsoft          | Microsoft           | Microsoft            |
| Name                    | Windows 10 Pro x64 | Windows 10 Pro x64  | Windows 10 Pro x64   |
| Build number or version | 1909               | 1909                | 1909                 |
| BIOS                    |                    |                     |                      |
| BIOS name and version   | 1.6.5              | R70 Ver. 01.03.04   | N2IET81W (1.59)      |
| Dimensions              |                    |                     |                      |
| Height (in)             | 0.79               | 0.71                | 0.7                  |
| Width (in)              | 14.1               | 12.84               | 13                   |
| Depth (in)              | 9.3                | 9.22                | 8.9                  |
| Weight (lbs.)           | 4.03               | 3.27                | 3.2                  |



# How we tested

## Recovering Microsoft Windows 10 Pro from a failed OS

We first ensured that each laptop we tested had a wired ethernet connection. The steps below are based on wired connectivity, but we noted how to leverage wireless connectivity for Dell SupportAssist OS Recovery for the Dell Latitude 5500 where applicable.

### Dell Latitude 5500

1. Turn on the computer.
2. When the Dell logo appears, press F12 repeatedly.
3. Select SupportAssist OS Recovery, and press Enter.
4. For wired connectivity, proceed to step 5. For wireless connectivity, follow these steps:
  - a. Click the wireless icon in the top right, and click Connect.
  - b. Select the wireless network.
  - c. Enter the security key if required, and click Done.
5. On the SupportAssist OS Recovery home page, click Start Reset.
6. On the Getting Started page, select Reset and update, and click Next.
7. On the Back Up Files page, select Yes, back up my files, and click Next.
8. On the What page, click Next.
9. Insert a USB drive, and click Continue.
10. On the Where page, select the USB drive, and click Next.
11. On the Backup Summary page, click Continue.
12. Check the box next to I understand..., and click Next.
13. At the Recovery process guide, unplug the USB drive, and click Restart.
14. Once the Windows 10 Setup screen appears, stop the timer.

### Lenovo ThinkPad T490

1. Turn on the computer.
2. During startup, press Enter repeatedly.
3. At the Startup Interrupt Menu, press F11.
4. Click Troubleshoot.
5. Click Reset this PC.
6. Click Keep my files.
7. Click your username.
8. Enter the password, and click Continue.
9. Click Reset.
10. Once the Windows 10 Setup screen appears, stop the timer.

### HP EliteBook 840

1. Turn on the computer.
2. During startup, press F11 repeatedly.
3. Select Recover from network.
4. Once the Windows 10 Setup screen appears, stop the timer.

## Scanning and repairing OS issues with Dell SupportAssist OS

We did not perform this scenario on the HP EliteBook 840 G6 or Lenovo ThinkPad T490 because their recovery approaches did not offer “scan and repair” functionality. Dell SupportAssist OS Recovery offered the following process before the Dell Latitude 5500 started the OS. For this testing scenario, we did not simulate a failure for the Dell Latitude 5500.

1. Turn on the computer.
2. When the Dell logo appears, press F12 repeatedly.
3. Select SupportAssist OS Recovery, and press Enter.
4. On the SupportAssist OS Recovery home page, click Repair.
5. Click Start Repair.
6. Once the repair completes, click Done.

## Using Dell BIOSConnect to access Dell SupportAssist OS Recovery for restoring the OS when the Dell Latitude 5500 has unreadable storage

1. Turn on the computer.
2. When the Dell logo appears, press F12 repeatedly.
3. Select SupportAssist OS Recovery, and press Enter.
4. On the SupportAssist OS Recovery Image Download page, click Start Recovery.
5. Once on the SupportAssist OS Recovery home page, continue with restore as normal.

## Executing post-recovery actions with Dell SupportAssist OS Recovery

In our testing, neither HP Sure Recover for the enterprise HP EliteBook 840 G6 nor the Windows-based recovery approach for the Lenovo ThinkPad T490 offered us a post-recovery process to help restore the laptops to their pre-OS failure state. Dell SupportAssist OS Recovery offered the following two processes after recovering the OS for the Dell Latitude 5500.

### Setting up Windows 10 Pro

1. At the Windows 10 License Agreement, click Accept.
2. At the Account setup page, select Set up for personal use, and click Next.
3. Select Offline account.
4. Select Limited experience.
5. Enter a username, and click Next.
6. Enter a password, and click Next.
7. Confirm the password, and click Next.
8. Answer three security questions, and after each, click Next.
9. At the fingerprint sign in, click Skip for now.
10. At the activity history page, click No.
11. At the digital assistant page, click Decline.
12. At the privacy settings, click Accept.
13. Wait for windows to complete installation.

## Recovering files and updating drivers and software for the Dell laptop

1. At the Recovery process guide, click Continue.
2. Click Retrieve Files, and click Yes.
3. Insert the USB drive.
4. Click Retrieve.
5. Once the process completes, click Done.
6. Click Check for Software, and click Yes.
7. Wait for Dell Digital Delivery to open.
8. Click Check For Updates, and then Check Windows Update.
9. At the Windows Update page, click Check for updates.
10. Once the laptop downloads the updates, click Restart now.
11. Log into Windows.
12. At the Windows Update page, click Check for updates.
13. Once the laptop downloads and installs the second round of updates, click Restart now.
14. Log into Windows.
15. To accept the default settings for Dell Command | Update, click OK.
16. Click Check.
17. Click Install.
18. Once the laptop finishes installation, click Restart.

This project was commissioned by Dell Technologies.



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