

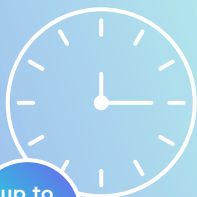
Spend less time and effort troubleshooting laptop hardware failures

Dell ProSupport Plus with SupportAssist resolved a hard drive failure in less time and fewer steps than premium HP and Lenovo support plans

Unresponsive laptops often require IT involvement. That means IT staff can spend significant time diagnosing a problem before even finding a resolution or ordering a replacement part.

Dell laptops offer a speedy, proactive approach to resolving hardware issues by using Dell ProSupport Plus with SupportAssist technology. At Principled Technologies, we initiated a hard drive failure in Dell, HP, and Lenovo™ laptops under premium service plans. Diagnosing the issue on the Dell laptop was faster than the other two: Dell ProSupport Plus with SupportAssist technology accurately resolved the issue and took care of the troubleshooting, potentially relieving IT staff of a time-consuming task.

Save time for your IT staff and users and keep business moving—choose Dell systems with ProSupport Plus with SupportAssist technology.



Save **up to 47** minutes

Faster resolution reduces downtime



fewer steps

Simpler resolution minimizes the chance for user error

Save time and effort with proactive Dell ProSupport Plus with SupportAssist technology

A simple step toward fixing a problem can keep it from becoming a major hassle. This applies to your workday, too; if missing the bus or train by just a minute can throw off your day's schedule, imagine how much an inoperable laptop can set you back. You go to open your laptop first thing when you get to your desk, expecting to see your usual background, and instead you see a warning. With the system you rely on out of commission, you need a service plan that will proactively help you solve the issue.

We replaced the working hard drives in Dell, HP, and Lenovo laptops with the same broken hard drive. Using the top-tier service plan from each vendor, we recorded how long it took to figure out what was wrong. Here's what we found.



Spend less time waiting for an accurate diagnosis

Out of the three service plans we tested, only Dell ProSupport Plus with SupportAssist technology used a proactive approach. The laptop offered us the option to run on-board diagnostics when it discovered the bad hard drive during boot up. We initiated the diagnosis scan by pressing F5. Within seconds, we received an email confirming that SupportAssist had opened a support request to start the replacement process. Thanks to ProSupport Plus, SupportAssist gave us two options: receive a replacement hard drive the next day or schedule an onsite visit to install the hard drive. In addition, the new hard drive from Dell had Microsoft® Windows® 10 pre-installed, but the two competitors sent us blank hard drives.

The other two service plans required us to figure out how to reach tech support, and troubleshoot the issue as they guided us through options. HP and Lenovo tech support resolved the issue after many minutes of answering questions and troubleshooting the problem via chat and phone.

Take fewer steps in issue identification

We had to do minimal troubleshooting with the Dell laptop, and it took fewer steps to reach a diagnosis. Compared to the other two, ProSupport Plus with SupportAssist helped save us time, as we went from clueless to informed in less than five minutes.

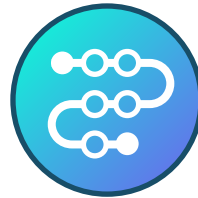


Detailed results

Dell ProSupport Plus and Next Business Day Onsite Service with SupportAssist technology



4:08 minutes
to resolution



6 steps
to resolution

When we attempted to power on the Dell laptop after installing the bad hard drive, the laptop showed us the option to press F5 to initiate an on-board diagnostics scan. The scan took one minute to complete and accurately and quickly identified a hardware issue. Once SupportAssist completed the scan, an on-screen message notified us of the hard drive problem and told us to either visit <https://supportassist.dell.com> on another web-enabled device or scan a QR code with a smartphone or tablet (we chose to scan the QR code with a smartphone). Scanning the code and logging into our SupportAssist account took approximately three minutes. We received two emails from SupportAssist within seconds of logging in: one informed us that Dell technical support had created a ticket based on the results of the diagnostics scan, and the other informed us that Dell would send us a replacement hard drive. We received a third email eight hours later informing us that the hard drive had been shipped and containing a tracking number for the shipment. We received the hard drive the next morning. An admin could save time installing a new Dell disk pre-installed with Windows 10 because they would not have to spend time installing the operating system.

Due to the proactive and accurate nature of SupportAssist technology, we didn't have to troubleshoot the issue after initiating the scan, send the laptop out for repair, or take the laptop to a qualified technician for confirmation of a diagnosis made over the phone. The proactive approach from Dell can minimize downtime for your users and reduce hassles for your IT staff.

HP Next Business Day Onsite Hardware Support with HP Accidental Damage Protection G2 and Defective Media Retention Care Pack



51:52 minutes
to resolution



19 steps
to resolution

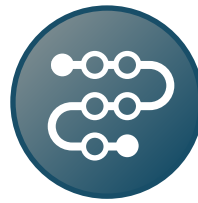
The HP diagnosis required more time and effort than using the Dell and Lenovo support plans. Before we could even chat with an HP tech support person, we spent significant time figuring out how to contact HP support. In addition, we had problems loading the website on the initial web browser we used. During this step, the webpage error we encountered caused us to spend more time searching and required opening a different browser. Any user might have experienced these issues, and we believe they are reflective of the HP support experience for at least some users. It took nearly 40 minutes of troubleshooting before we could communicate with an HP tech support person.

While searching the HP website for a way to communicate with their tech support, the HP chat support option loaded, and we chatted with an HP technician for over 12 minutes. The technician informed us that HP would ship us a new blank hard drive that we would receive in two to three business days depending on parts availability. Two to three days without a laptop can halt significant productivity for a user. We promptly received a confirmation email stating that our service case had been submitted. An hour and twenty minutes later, we received an email stating the part we needed was on backorder and delayed due to exceptional circumstances. Two hours later however, we received an email stating that the replacement hard drive had shipped, and we received the blank hard drive the next morning (before the two- or three-business-day window per the technician). The prompt delivery surprised us, but if we had actually needed to install the replacement hard drive, we would have spent more time and steps installing the Windows 10 operating system.

Lenovo Premier Support Onsite, Accidental Damage Protection, and Keep Your Drive protection



41:30 minutes
to resolution



12 steps
to resolution

Even though the experience with HP took the most time, Lenovo support took the longest to identify the issue. We first submitted an eticket for support. We waited 10 minutes but never received an email confirmation after submitting the request for help, so we decided to try another option, "Call for Premier Support." We called the phone number listed on the website and received an automatic message that said the wait would be greater than 10 minutes. We left our callback number and immediately received a call back by Lenovo support before we hung up the phone. We were on the phone with them for over 15 minutes. The following things of note occurred during our phone call:

- The support tech instructed us to enter the BIOS to see if the hard drive was visible. It was not immediately visible based on the tech's instructions.
- The tech then took the system serial number and attempted to tell us what kind of hard drive the system came with. The tech told us to look for a Seagate 1TB drive (our system came with a Toshiba 500GB drive).
- After we opened each BIOS tab to search for the hard drive, we located it under the Startup→Boot tab. It was at that point that the tech discovered he had incorrectly typed the last digit of the serial number we gave him. He then verified that we did indeed have a Toshiba 500GB hard drive.

The tech did not confidently acknowledge the issue with the hard drive but still wanted to send us a new one. It was at this point that we reiterated to the Lenovo tech that we had run the Lenovo Diagnostics tests and that the laptop had failed some of the storage tests. The tech responded more confidently by stating that we definitely needed another drive. We promptly received an email confirming our service request had been submitted, and we received an email nearly 45 minutes later stating that the replacement hard drive had shipped. We received the replacement drive the next morning.

The Lenovo Premier Support Onsite diagnosis necessitated some hands-on user trial and error, didn't accurately diagnose the problem at first, and took over 41 minutes of our time.



Conclusion

Unresponsive laptops will slow down your users and require some time from your IT staff. If there is a hardware failure, such as a hard drive going bad, any proactive step can save time or ease the identification and resolution process for your admin and user. This process helps admins get back to routine tasks sooner and allows your users to get back to being productive. We found that Dell ProSupport Plus with SupportAssist technology diagnosed and initiated the repair process in less time, in fewer steps, and with less troubleshooting than comparable HP and Lenovo support plans for their laptops. If Dell laptops with ProSupport Plus with SupportAssist experience a hardware issue, they have proactive technology that can quickly diagnose the issue.

On February 7, 2018, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on February 21, 2018.

System configuration and service plan information

The table below presents detailed information on the laptops we tested and the premium service plan purchase with each laptop.

Laptop configuration information	Dell Latitude E5480	HP ProBook 640 G3	Lenovo ThinkPad® T470
Support plan	ProSupport Plus and Next Business Day Onsite Service	Next Business Day Onsite Hardware Support with HP Accidental Damage Protection G2, and Defective Media Retention Care Pack	Lenovo Premier Support Onsite, Accidental Damage Protection, and Keep Your Drive protection
Processor			
Vendor and model	Intel® Core™ i5-7200U	Intel Core i5-7200U	Intel Core i5-7200U
Core frequency (GHz)	2.5 – 3.1	2.5 – 3.1	2.5 – 3.1
Cache	3MB L3	3MB L3	3MB L3
Memory module(s)			
Size (GB)	4	4	4
Type	DDR4	DDR4	DDR4
Speed (MHz)	2,400	2,400	2,400
Integrated graphics			
Vendor and model	Intel HD Graphics 620	Intel HD Graphics 620	Intel HD Graphics 620
Storage			
Amount (GB)	500	500	500
Type	7,200 spindle	7,200 spindle	7,200 spindle

How we tested

We replaced the working hard drives in the Dell, HP, and Lenovo laptops with the same broken hard drive. Then, we figured out how long it took each support plan to figure out what was wrong, using the top-tier service plan from each vendor.

Preparing for the test

1. When the system arrives, power on the system, and register each system.
2. Power off the system, and replace the hard drive with the corrupt, test hard drive.

Conducting the test

We stopped timing these experiences when tech support provided their preliminary diagnosis of the problem and told us how to proceed from there.

1. Power on the system.
2. Run the system's hardware diagnostic scan.
3. Follow the instructions on screen. If there are none, look up the information online about how to contact tech support.
4. Contact tech support, and follow the troubleshooting steps indicated by the technician.

Our results

The table below presents our findings in detail. We present the steps below as we experienced them during the diagnosis process. However, user experience may vary.

Steps by user	Dell ProSupport Plus with Next Business Day Onsite Service QR Code
1	We powered on the laptop and simultaneously started the timer.
2	The following message appeared: "No bootable devices found. Press F1 key to retry boot. Press F2 key for setup utility. Press F5 key to run onboard diagnostics." We pressed F5.
3	The Diagnostic scan launched and started scanning. The scan took one minute to complete. The following message appeared: "ePSA 4304.17 Alert. Hard Drive 0 – S/N, Short self test unsuccessful. Continue troubleshooting the system with the information provided below at https://supportassist.dell.com or with technical support. Use a mobile device to scan the QR code to continue troubleshooting." We scanned the QR code with a smartphone.
4	On the smartphone, Safari® opened automatically, and the SupportAssist Pre-Boot System Performance Check webpage loaded with the Error Code, Validation Code, and Service Tag. We checked the box for "I'm not a robot" and pressed the Submit button.
5	On the smartphone, the following description of the issue appeared: "Critical issue found. Recommended action: Replace hard drive. The replacement part is free under warranty." We pressed Sign In and signed in with the registered Dell account.
6	ProSupport gave us the option of an onsite visit, but we chose to receive the replacement drive. We verified the shipping address information and pressed the Submit button. A confirmation screen appeared on our smartphone stating: "We're sending you a free replacement part." At the same time, we received an email Support Request confirmation and an email replacement confirmation. We received an email eight hours later with shipping information; Dell shipped the replacement part via next-day delivery and it arrived on time.
Total diagnosis steps	6
Total diagnosis time	4:08

Steps by user	Lenovo Premier Support ADP/Onsite/Keep Your Drive
1	We powered on the laptop and simultaneously started the timer.
2	<p>A blue menu appeared with two tabs:</p> <ul style="list-style-type: none"> • Boot Menu • App Menu <p>We first selected the ATA HDD0: TOSHIBA MQ01ABF050 option listed under the Boot menu tab, which blinked and brought us to the same screen.</p> <p>We then selected the App Menu tab and chose the Lenovo Diagnostics option.</p>
3	<p>From the Lenovo Diagnostics home screen, we selected the Storage test.</p> <p>We selected all Storage Options and clicked Next.</p> <p>We selected all Storage Device tests and clicked Run Tests to run the following tests:</p> <ul style="list-style-type: none"> • Smart status test • Smart short self-test • Drive self-test • Random seek test • Funnel seek test • Target read test <p>The storage tests took three minutes and six seconds to complete.</p> <p>The drive failed the “Smart short self-test” and the “Target read test” with the Final Result Code: U1E4LQLJK-D4LN56.</p> <p>Note: We could not locate further information from the Lenovo Diagnostics on how to contact Lenovo Support.</p>
4	<p>Using a web browser on a different laptop, we searched the internet for “Lenovo Support” and visited https://pcsupport.lenovo.com/us/en/.</p> <p>Using our registered email and password, we signed into our Lenovo account.</p> <p>We entered the serial number of the system into the Find Your Product field and clicked the search button.</p>
5	We were taken to the Product Home screen where we selected Contact Us from the top header options.
6	<p>We were taken to the Contact Us webpage with several options:</p> <ul style="list-style-type: none"> • Submit Premier eTicket • Call for Premier Support • International Warranty Service • Consult Our Forum <p>We chose the first option listed, which was Submit Premier eTicket.</p>
7	We filled out the eTicket Form with our contact information, system serial number, and brief description of the problem (i.e. “Failed to boot. Ran Lenovo Diagnostics and got result code U1E4LQLJK-D4LN56”) and clicked Submit.
8	<p>After submitting the request, we were taken to a webpage with the following message:</p> <p>“Thank you for your request. You will be receiving a confirmation email shortly that includes your Service Request number and how to contact Lenovo. If you have not received a response within 10 minutes, please check your “trash” or “spam” folder.”</p> <p>We waited 10 minutes but never received an email confirmation, so we decided to go back and try Call for Premier Support, the second option from step 6.</p>
9	<p>We clicked Call for Premier Support and called the phone number, 1(855) 669-3600.</p> <p>The automatic message we received informed us that the wait would be greater than 10 minutes, so we left our callback phone number. Lenovo Support immediately called us back before we even hung up the phone.</p>

Steps by user	Lenovo Premier Support ADP/Onsite/Keep Your Drive
10	<p>With the Lenovo tech on the phone, we gave a brief description of our problem and the Lenovo Diagnostic failure code.</p> <p>The tech instructed us to enter the BIOS to see if we could see the hard drive within the BIOS. We did not see the hard drive listed on the main BIOS screen.</p> <p>The tech then took the laptop's serial number and attempted to tell us what kind of hard drive the laptop came with. The tech told us to look for a Seagate 1TB drive. Note: Our laptop came with a Toshiba 500GB drive.</p> <p>The BIOS menu under the Startup→Boot tab listed the Toshiba hard drive. At that point, the tech discovered he had incorrectly typed the last digit of the serial number we gave him. He verified that we had a Toshiba 500GB hard drive.</p>
11	<p>The tech had us set the BIOS to factory defaults and reboot the laptop.</p> <p>While the laptop was rebooting, the tech asked if we had any external USB drives connected, which we did not.</p> <p>When the same error occurred, he asked us if we had Windows 7 or 10 installed. After telling him we had Windows 10, he had us once again go into the BIOS and see if the boot device was set to UEFI only or Legacy. Our laptop was set to UEFI only.</p>
12	<p>The tech did not confidently acknowledge the issue with the hard drive but still wanted to send us a new one.</p> <p>It was at this point that we reiterated to the Lenovo tech that we had run the Lenovo Diagnostics tests and that it had failed some of the storage tests. The tech responded more confidently by stating that we definitely needed another drive.</p> <p>The Lenovo Tech decided to send us a new blank drive along with the Lenovo installation media.</p> <p>The Lenovo Tech Support call lasted 15 minutes and 50 seconds.</p>
Total diagnosis steps	12
Total diagnosis time	41:30

Steps by user	<p style="text-align: center;">HP Next Business Day Onsite Hardware Support w/ADP-G2/Defective Media Retention</p>
1	We powered on the laptop and simultaneously started the timer.
2	<p>The laptop displayed the following message:</p> <p>“Boot Device Not Found</p> <p>Please install an operating system on your hard disk.</p> <p>Hard disk (3F0)</p> <p>F2 System Diagnostics</p> <p>For more information, please visit: www.hp.com/go/techcenter/startup”</p> <p>We pressed F2.</p>
3	<p>The HP PC Hardware Diagnostics UEFI Tool launched, and we were given the option of performing either a Memory Test or a Hard Drive Check. We chose Hard Drive Check and then chose Quick Test from the two options.</p> <p>The scan took one minute and eight seconds to complete. At the end of the scan, a message appeared saying that the SMART Check passed, but that the Short DST test failed. It also stated: “For more information, please visit: www.hp.com/go/techcenter/PCDiags.”</p>
4	Using a web browser on a different machine, we navigated to the URL provided in step 3 (www.hp.com/go/techcenter/PCDiags), which was titled “HP PC Hardware Diagnostics.”
5	<p>This page gave us information on HP PC Hardware Diagnostics, including links to the diagnostic software, but we did not find anything obvious on the page about how to get help on our error.</p> <p>After carefully looking over the entire page, we decided to click the link at the top of the page titled Support. This opened a sub-menu. We selected Support & Troubleshooting from the sub-menu.</p>
6	<p>We were then taken to a page titled “Welcome to HP Customer Support” (https://support.hp.com/us-en/).</p> <p>After reviewing the page, we decided to click on Support Portal Guided Tour from the list of options under Other support resources. Note: In hindsight, we may have done better to select Contact Support from the blue banner located just below the page title.</p>
7	<p>This link opened a page titled “HP Customer Support” (https://support.hp.com/us-en/topic/supportsitehelp).</p> <p>After carefully looking at the page, we decided to click on How to submit a ticket or create a support case, about two-thirds of the way down the page. Note: The same blue banner was on this page just below the page title.</p>
8	<p>We were taken to a page titled “Welcome to HP Customer Support” (https://support.hp.com/us-en/document/c05441222).</p> <p>We clicked on the “+” next to Create a new case. The only thing that resulted from clicking the “+” was a set of instructions, which we followed. We started by clicking Business Support located in the blue banner at the top of the page (the instructions and screenshot refer to it as “My Business Support”) and then selecting Create a new case.</p>
9	<p>We then attempted to log in using the same information when we registered the laptop using the HP Support Assistant Tool.</p> <p>The credentials we created when we originally registered the laptop did not work, so we decided to re-register the laptop. We completed the registration, and the site instructed us to wait for a registration email. This email did not arrive for several minutes.</p> <p>While we waited to receive the registration email, we decided to click on the Contact Support option in the blue banner at the top of the webpage. When we clicked the Sign in button, we received a webpage error that said “400 Bad Request.” We got the same error after we clicked the Continue as guest link.</p> <p>We received the registration email we had been waiting for and completed our registration.</p> <p>We signed in using the registration email link.</p>

Steps by user	HP Next Business Day Onsite Hardware Support w/ADP-G2/Defective Media Retention
10	We filled out the Case management profile settings and clicked Save (Note: We had problems saving this online form. We reviewed the page several times to ensure we had entered data in every required field (as denoted by a red asterisk next to several of the fields). We finally figured out that the only way to save the Case management profile was to click the Validate address button, select the address from the validation dialog box that appeared, and click OK. There was no red asterisk to indicate that address validation was a required step before saving.)
11	After saving our HP Case management profile settings, the site lead us to a Submit a new case webpage. We entered the serial number of the laptop and clicked Create case.
12	The site then took us to a Case Creation webpage where we had to enter a description of our error and an error code. We had the option of giving the Case priority, and we chose "0 - Immediate priority." After filling out the information on our issue, we clicked Submit case.
13	The site took us to a webpage with the following message: "Case successfully submitted! An email confirmation of this case will be sent to the primary contact. HP will contact you to begin resolution based on your contract or warranty coverage."
14	While we waited for our confirmation email, we discovered that a different browser started loading the Contact Support option that gave us the "400 Bad Request" (see step 10). We originally used Google Chrome™, but when we switched to Microsoft Edge, we did not receive the "400 Bad Request" error. Using Edge, we clicked on Contact Support. Note: The link worked in Chrome when we checked later, which indicates it was probably not a browser-specific problem.
15	We clicked the option to "Sign in as a guest."
16	We entered the serial number of the laptop and clicked Find.
17	We clicked "Show options" and saw the options Chat: Our fastest support option and a support phone number. We chose to chat by clicking Chat now.
18	We filled out the Initiate Chat Support pop-up window with First name, Last name, Email, Phone number, and a brief description of the problem and then clicked Submit.
19	During the Chat session, the HP tech verified our information and immediately told us the Failure ID was valid and that HP would ship us a new blank hard drive that we would receive in two to three business days depending on parts availability. The chat session lasted 12 minutes and 41 seconds.
Total diagnosis steps	19
Total diagnosis time	51:52

This project was commissioned by Dell Technologies.



Facts matter.®

Principled Technologies is a registered trademark of Principled Technologies, Inc.
All other product names are the trademarks of their respective owners.

DISCLAIMER OF WARRANTIES; LIMITATION OF LIABILITY:

Principled Technologies, Inc. has made reasonable efforts to ensure the accuracy and validity of its testing, however, Principled Technologies, Inc. specifically disclaims any warranty, expressed or implied, relating to the test results and analysis, their accuracy, completeness or quality, including any implied warranty of fitness for any particular purpose. All persons or entities relying on the results of any testing do so at their own risk, and agree that Principled Technologies, Inc., its employees and its subcontractors shall have no liability whatsoever from any claim of loss or damage on account of any alleged error or defect in any testing procedure or result.

In no event shall Principled Technologies, Inc. be liable for indirect, special, incidental, or consequential damages in connection with its testing, even if advised of the possibility of such damages. In no event shall Principled Technologies, Inc.'s liability, including for direct damages, exceed the amounts paid in connection with Principled Technologies, Inc.'s testing. Customer's sole and exclusive remedies are as set forth herein.