



**Hewlett Packard  
Enterprise**

# Driving HDD and SSD value with HPE Firmware

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Hewlett Packard Enterprise works actively to optimize the firmware in HPE drives to enable predictable, consistent behavior in HPE servers and storage systems. Coupled with strenuous testing and qualification processes, this focus on firmware leads to HPE-qualified and -certified drives that work optimally in HPE systems.

## Executive summary

Thanks to extensive investments in firmware and rigorous product testing, [HPE hard disk drives and solid-state drives](#) offer a range of benefits that go far beyond those of off-the-shelf drives. HPE firmware enables predictable drive functionality and performance, enhanced cooling, optimized storage management, unique drive features, and smart firmware updates. Users of HPE drives also benefit from the latest hardware and firmware, high drive quality, and rigorous reliability testing. Due to HPE's emphasis on firmware, testing, and drive qualification, your organization can be confident that HPE-qualified and -certified drives will work optimally in your HPE systems.

## All drives are not created equal

Even when they have identical specifications on paper, not all hard disk drives and not all solid-state drives are the same. There are many potential differences in components and firmware used on the storage devices, and these differences can make or break your experience with a drive.

With off-the-shelf drives, you can't be sure the drive has been correctly set for proper operation with your HPE ProLiant servers and HPE storage systems. These incompatibilities can create configuration problems and can rob your system of performance. In the worst case, incompatibilities among drives, controllers, and systems might cause you to lose data.

Even among drives supplied by our partners, there's no industry standard or commonality in the firmware, because different suppliers have different criteria. In response, HPE has defined its own set of standards for best-in-industry design behaviors, which we build into our firmware image and implement across all suppliers to ensure compatible, predictable, and consistent performance. HPE drives are specifically designed and tested with the goal of delivering flawless operation in HPE [servers](#) and [storage](#) systems. HPE firmware optimization is one of the keys here. The capabilities engineered into the firmware create an enterprise-class drive tailored for HPE systems—a drive very different from an off-the-shelf product.

Let's look at some of the key advantages of HPE firmware in HPE drives.

## The advantages of HPE firmware

### Predictable functionality and performance

HPE firmware is optimized for both functionality and performance with HPE Smart Array controllers and HPE server and storage systems. In simple terms, the firmware enables the behavior of the drive to conform to the expectations of the storage controllers.

What's more, HPE firmware enables consistent, predictable behavior among drives sourced from multiple industry top-tier manufacturers and among different generations of drive technology. This doesn't happen by chance. HPE drive qualification and development engineers work closely with drive manufacturers to help them understand the way their drives must behave in HPE systems. This work goes far beyond ensuring that drives conform with industry-standard specifications that all such devices are expected to meet.

### Enhanced cooling

HPE firmware is optimized for system control of fans and thermal management in HPE storage drives. The firmware works in tandem with thermal sensors and the [HPE Integrated Lights Out \(iLO\) Management Engine](#) to regulate cooling in HPE drives. If a drive is running hot, HPE iLO kicks up the cooling. If a drive is running cool, the software scales back the cooling. This capability helps you increase the efficiency of power usage and reduce operational expenses.

## Optimized storage management

HPE firmware is optimized for HPE storage management tools. The firmware works in tandem with the HPE Smart Storage Administrator (SSA). HPE SSA provides online, high availability configuration, management, and diagnostic capabilities in support of all HPE Smart Array controllers.

The software consistency of the related tools reduces the cost of training for each successive generation of product and takes much of the guesswork out of troubleshooting field problems. These tools help you lower your total cost of ownership by reducing the training and technical expertise necessary to install and maintain HPE server storage.

## Unique features

HPE firmware has unique features that are not available in off-the-shelf drives. That's the case with the HPE SmartSSD Wear Gauge feature, which is built into HPE solid-state drives (SSDs). The HPE SmartSSD Wear Gauge provides tools that report on the amount of lifetime remaining in an SSD, which by their nature have a limited service life.

The HPE SmartSSD Wear Gauge uses HPE-specific data generated by the SSD controller to calculate and report SSD endurance continuously. Various HPE storage tools access and report this data, allowing you to monitor SSD endurance in real time.

This technology helps you ward off problems. In general, SSDs that have not reached their endurance limit are just as reliable—if not more reliable—than traditional disk drives. But once they have reached their endurance limit, you need to replace them to avoid increasing error rates and possible drive failures.

## Smart firmware updates

HPE makes it easy for you to keep your HPE drives up to date with the latest firmware updates and fixes, thanks to Smart Update Manager (SUM).

This technology is included in many HPE systems software maintenance and management products for installing and updating firmware and system software components on HPE hardware. SUM interrogates drives to identify the firmware versions the drives are using. SUM then notifies you of any available firmware upgrades.

SUM uses smart components to update the firmware. You are also able to run smart components without SUM under Linux®, Microsoft® Windows®, and VMware® ESXi™. Both smart components and SUM are distributed on the Service Pack for ProLiant (SPP).

Smart components also support nondisruptive updates (NDU). When the drive and storage controller both support NDU, the smart component will flash the drive firmware, activating a new firmware image without requiring you to reboot the server.

## Security

HPE builds best-in-industry security features into our firmware. As part of this process, we require our suppliers to adhere to specific HPE security requirements. And we meticulously monitor their design implementations to make sure our high standards are met.

We've also recently updated to digitally signed (DS) firmware, which adds another layer of protection at the drive level. DS firmware helps prevent malicious modifications to drive firmware, protecting data on drives from viruses, theft, and erasure.

## Some other advantages of HPE drives

While firmware is a key differentiator, the advantages of HPE drives don't stop at firmware. Let's look at some of these additional advantages.

### Latest hardware and firmware

HPE drives may have firmware or hardware fixes that are not in generic drives. HPE works closely with its third-party manufacturing partners to verify that HPE customers are getting the latest and greatest products, in terms of both hardware and firmware.

### High drive quality

HPE drives have critical components that are configuration controlled, to provide product consistency and exceptional quality. HPE Quality Engineering routinely audits our suppliers' drive manufacturing processes, quality, and yields. Field failure analysis results in a closed loop corrective process that helps ensure product design quality and reliability.

### Rigorous reliability testing

HPE drives go through rigorous reliability testing and quality control at HPE kitting facilities. Additionally, we test drives under a variety of real-world conditions for over 3.35 million hours.<sup>1</sup> This process includes quality audits conducted by a third party on HPE's behalf.

In addition, HPE drives undergo intense scrutiny as part of our Hard Disk Drive Qualification (HDDQ) System. Through this system, HPE performs testing to verify compliance with many industry standards, which enables drives to perform correctly when integrated with other industry-standard components.

Manufacturers who aren't part of the HPE supply chain aren't in a position to test their storage devices on HPE systems as thoroughly as HPE does if they test them at all. HPE leverages testing performed on various HPE computing platforms, and works with suppliers to improve their storage device performance for HPE-specific products.

**Table 1.** HPE drives versus generic drives

| Compatible features   | HPE drives with HPE firmware | Generic drive without HPE firmware |
|---|------------------------------|------------------------------------|
| HPE SmartDrive features:  | Yes                          | No                                 |
| <ul style="list-style-type: none"> <li>Predictive spare activation</li> <li>Drive erase command for HDD</li> <li>Sanitize Crypto erase/Block erase for SSD</li> <li>Critical component configuration control</li> </ul> |                              |                                    |
| HPE Insight Control Power Management  | Yes                          | No                                 |
| HPE iLO   | Yes                          | No                                 |
| HPE Smart Array Controller  | Yes                          | No                                 |
| HPE Smart Update Manager  | Yes                          | No                                 |
| HPE SmartSSD Wear Gauge   | Yes                          | No                                 |
| HPE Active Health System  | Yes                          | No                                 |
| HPE Systems Insight Manager   | Yes                          | No                                 |
| Ongoing reliability testing   | Yes                          | No                                 |
| Kitting facility quality control  | Yes                          | No                                 |

<sup>1</sup> HPE Internal Lab Testing: 3.35M hour test quant is derived from a combination of drive qualification test plans, specifically HDDQ spec-supplier responsibility to perform, HDDQ spec-HPE responsibility to perform, Reliability Demonstration Test (RDT) spec, CSI integration test spec, and Pilot test requirements. Test was conducted in May 2017.

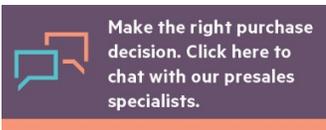
## Key takeaways

The HPE focus on firmware yields predictable, consistent drive behavior in HPE systems and storage controllers. As a result of our emphasis on firmware and our strenuous testing and qualification processes, HPE is able to offer HPE-qualified and -certified drives that work optimally in HPE systems.

Ultimately, with so much riding on your data, purchasing HPE hard disk and solid-state drives for use in your HPE systems is a good business decision.

## Learn more at

[hpe.com/info/serverstorage](http://hpe.com/info/serverstorage)



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