

Overview

HPE Hard Disk Drives

HPE Hard Disk Drives (HDDs) are engineered to deliver optimum performance, reliability, compatibility, and data security across HPE server and storage platforms making them the preferred choice for workloads ranging from small businesses to large enterprise.

Performance:

- HPE HDDs are tuned and tested with on-going quality monitoring throughout their lifecycle
- HPE optimizes HDD firmware for predictable and consistent HDD performance
- Full portfolio of high-performance Mission Critical and high-capacity Business Critical drive solutions

Reliability:

- HPE’s industry-leading rigorous testing and qualification program, backed by 2.4 million test hours<sup>1</sup>
- Pre-failure Alerts with HPE Smart Array Controller, Systems Insight Manager, and HPE Smart firmware
- 3x faster firmware and software updates with HPE Service Pack for ProLiant (HPE SPP)
- Best-in-class supply assurance program reduces downtime due to product delays

Compatibility:

- Simplify HDD planning and standardize HDDs across HPE server and storage solutions
- Common HDD carriers mean re-purposing drives in other servers is a snap

Security:

- HPE Digitally Signed Firmware helps prevent against malicious attacks
- HPE Smart Array SR Secure Encryption is a FIPS 140-2 Level 1 validated enterprise class controller-based encryption solution for data-at-rest on all SAS/SATA drives
- HPE Smart Carriers report drive activity and health

HPE HDDs are available for three types of workloads: Enterprise high-performance (Mission Critical), Midline high-capacity (Business Critical) and Entry-level storage solutions

HPE HDD portfolio: Proven performance for every workload

| Class       | Enterprise                                                                                                              |             | Midline                                                                                           | Entry*                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|------------------------------------|
| Workload    | High                                                                                                                    |             | Medium                                                                                            | Low                                |
| Usage       | <b>Mission-critical, high I/O:</b><br>Email, enterprise resource planning (ERP), customer relationship management (CRM) |             | <b>Business Critical, High capacity, high availability storage:</b><br>Backup, archive, reference | <b>Low I/O:</b><br>Boot and backup |
| Interface   | SAS 12Gb                                                                                                                |             | SAS 12Gb<br>SATA 6Gb                                                                              | SATA 6Gb                           |
| RPM         | 15000                                                                                                                   | 10000       | 7200                                                                                              | 7200                               |
| Form factor | SFF & LFF                                                                                                               | SFF         | SFF & LFF                                                                                         | LFF                                |
| Capacities  | Up to 900GB                                                                                                             | Up to 2.4TB | Up to 16TB                                                                                        | Up to 4TB                          |
| Warranty    | 3 years                                                                                                                 | 3 years     | 1 year                                                                                            | 1 year                             |

\* Supported on select HPE ProLiant servers only.

## Overview

### What's New

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- P23449-X21 HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD
- P23608-X21 HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD
- P23857-X21 HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD
- P23863-X21 HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD
- P24750-K21 HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) ST 512e ISE HDD
- P24751-K21 HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) ST 512e ISE HDD

### Firmware Updates:

- Digitally Signed Firmware – Prevent unauthorized access to your data with the expansion of integrated HPE Digitally Signed Firmware (DS) on new drives; providing the security and assurance that drive firmware comes from a trusted source and protects against malicious attacks.

For advanced data protection and encryption, customers should consider HPE Smart Array Controllers with HPE Smart Array Secure SR Encryption. It is a controller-based data encryption solution for HPE servers that protect data-at-rest on any bulk attached storage. This solution meets stringent compliance regulations such as HIPAA and Sarbanes-Oxley.

### HDD Selection

To streamline the configuration process for HPE ProLiant servers and to provide the best product availability, HPE recommends HDDs from the list located here: <http://www.hpe.com/products/recommend>

Best product availability is limited to US, Canada, and Latin America at this time.

XXXXXX-**X21** is SKU designation formed by a common six digit part number and a **-X21** suffix that identifies a SKU that is available across multiple server family lines. Refer to the table below to find the SKU suffix that applies to the specific server product line this option can be ordered with.

| <b>-B21<br/>COMPUTE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>-H21<br/>SPECIALIZED COMPUTE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>-K21<br/>STORAGE</b>                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HPE Cloudline<br>CL2100/CL2200/CL2800/CL3100/CL4100/CL5200/CL5800 Servers<br>HPE Composable Cloud for ProLiant DL<br>HPE Converged System 700/750<br>HPE ProLiant BL460c/BL660c Servers<br>HPE ProLiant DL20/DL160/DL180 Servers<br>HPE ProLiant<br>DL325/DL360/DL380/DL385/DL560/DL580 Servers<br>HPE ProLiant DX360/DX380 Servers<br>HPE ProLiant for Microsoft Azure Stack<br>HPE ProLiant MicroServer<br>HPE ProLiant ML30/ML110/ML350 Servers<br>HPE Synergy 480/660 Systems | HPE Apollo 35/40/70 Systems<br>HPE Apollo 2000/6000 Servers<br>HPE Converged System 300/500<br>HPE Edgeline Systems and Servers<br>HPE Integrity BL860c i6/BL870c i6/BL890c i6 Server Blades<br>HPE Integrity MC990 X Server<br>HPE Integrity rx2800 i6 Server<br>HPE Integrity Superdome<br>HPE ProLiant DX170r/DX190r, DX2000 Servers<br>HPE SGI 8600 System<br>HPE Solutions for SAP HANA (TDI)<br>HPE Apollo r2600, XL170r, XL190r, and XL270d for BlueData Software | HPE Apollo 4200 Servers<br>HPE Apollo 4510 System<br>HPE Apollo 4200 Server for BlueData Software<br>HPE D2220sb/D2500sb Storage Blade<br>HPE D3000/D6020/D8000 Disk Enclosures<br>HPE Scalable Object Storage with Scality RING<br>HPE SimpliVity 2600<br>HPE SimpliVity 325/380<br>HPE Storage File Controllers<br>HPE StoreEasy 1460/1560/1660/1660 Exp/1860 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Disclaimer:</b> This may not be a complete listing of applicable servers                                                                                                                                                                                                                                                                                     |

## Overview

| Models               |           |             |        |                          |                          |                          |                          |
|----------------------|-----------|-------------|--------|--------------------------|--------------------------|--------------------------|--------------------------|
| Category             | Interface | Form Factor | Format | Capacity                 | HDD Carrier              |                          |                          |
|                      |           |             |        |                          | Smart Carrier SKU        | Low Profile SKU          | Standard Carrier SKU     |
| Enterprise (15K rpm) | SAS 12G   | LFF         | 512n   | 300GB                    | P04693-B21 (SCC)         | -                        |                          |
|                      |           |             |        | 600GB                    | P04695-B21 (SCC)         | -                        |                          |
|                      |           |             |        | 900GB                    | -                        | 870761-X21 (LPC)         |                          |
|                      |           | SFF         |        | 300GB                    | 870753-X21               | -                        |                          |
|                      |           |             |        | 600GB                    | 870757-X21               | -                        |                          |
|                      |           |             |        | 900GB                    | 870759-X21               | -                        |                          |
| 512n                 |           |             | 300GB  | 872475-X21               | -                        |                          |                          |
|                      |           |             | 600GB  | 872477-X21               | -                        |                          |                          |
|                      |           |             | 1.2TB  | 872479-X21               | -                        |                          |                          |
| 512e                 |           |             | 1.8TB  | 872481-X21               | -                        |                          |                          |
|                      |           |             | 2.4TB  | 881457-X21               | -                        |                          |                          |
|                      |           |             | 2TB    | 872485-B21               | 833926-X21               |                          |                          |
|                      |           |             | 4TB    | 872487-B21               | 833928-X21               |                          |                          |
|                      |           |             | 6TB    | 846514-B21               |                          |                          |                          |
|                      |           |             | 512e   | 6TB                      | 861754-B21               | 861746-X21               |                          |
|                      |           |             |        | 8TB                      | 819201-B21               | 834031-X21               | 858384-B21               |
|                      |           |             |        | 12TB                     | 881779-B21               | 881781-X21 <sup>He</sup> | 881783-B21 <sup>He</sup> |
| 14TB                 |           |             |        | P09153-B21 <sup>He</sup> | P09155-X21 <sup>He</sup> |                          |                          |
| 16TB                 |           |             |        | P23863-X21 <sup>He</sup> | P23608-X21 <sup>He</sup> | P24751-K21 <sup>He</sup> |                          |
| 512n                 |           |             | 1TB    | 832514-X21               | -                        |                          |                          |

Overview

| Category              | Interface | Form Factor | Format | Capacity                 | HDD Carrier              |                          |                      |
|-----------------------|-----------|-------------|--------|--------------------------|--------------------------|--------------------------|----------------------|
|                       |           |             |        |                          | Smart Carrier SKU        | Low Profile SKU          | Standard Carrier SKU |
| Midline<br>(7.2K rpm) | SAS 12G   |             | 512e   | 2TB                      | 765466-X21               | -                        |                      |
|                       | SATA 6G   | LFF         | 512n   | 1TB                      | 861691-B21               | 861686-X21               |                      |
|                       |           |             |        | 2TB                      | 872489-B21               | 861681-X21               |                      |
|                       |           |             |        | 4TB                      | 872491-B21               | 861683-X21               |                      |
|                       |           |             | 512e   | 6TB                      | 861750-B21               | 861742-X21               |                      |
|                       |           |             |        | 8TB                      | 819203-B21               | 834028-X21               |                      |
|                       |           |             |        | 12TB                     | 881785-B21 <sup>He</sup> | 881787-X21 <sup>He</sup> |                      |
|                       |           |             |        | 14TB                     | P09163-B21               | P09165-X21               |                      |
|                       |           |             | 16TB   | P23857-X21 <sup>He</sup> | P23449-X21 <sup>He</sup> | P24750-K21 <sup>He</sup> |                      |
|                       |           | SFF         | 2TB    | 765455-X21               | -                        |                          |                      |
|                       |           |             | 512n   | 1TB                      | 655710-X21               | -                        |                      |

| Category        | Interface | Form factor | Format | Capacity                                                | HDD Carrier<br>No Carrier SKU (Raw/Non-Hot Plug) |
|-----------------|-----------|-------------|--------|---------------------------------------------------------|--------------------------------------------------|
| Entry<br>(7.2K) | SATA 6G   | LFF         | 512e   | 1TB                                                     | 843266-B21*                                      |
|                 |           |             | 512n   | HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD | 801882-B21                                       |
|                 |           |             |        | HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD | 801888-B21                                       |

**NOTE:** <sup>He</sup> Helium Drive.

**NOTE:** Refer to the appropriate Server QuickSpecs for full compatibility details.

**NOTE:** \*Also known as “Desktop Drive”, this drive has Generic Firmware (Non-HPE)

## Standard Features

### What is HPE Hard disk drive?

Hewlett Packard Enterprise drives are tuned to deliver optimum performance for HPE Servers. They undergo an intense qualification process to eliminate firmware and O/S incompatibilities. HPE drive firmware is designed to maximize both functionality and compatibility with HPE ProLiant Rack and Tower Servers, Apollo family, Blade and Synergy Platforms.

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### Drive Quality and Performance

While selecting the drives in our HPE portfolio, only those drives with a performance level suitable for an enterprise environment are selected through the Hewlett Packard Enterprise qualification process and are labeled "best-in-class."

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### Pre-Failure Alert

When used in conjunction with a SMART Array Controller and Systems Insight Manager, the SMART capable firmware in HPE hard drives enables extensive fault prediction capabilities. If potential problems develop in one of the drives, the Smart Array Controller, Systems Insight Manager and/or SMART hard disk drive lets you know in advance so you can have the drive replaced, before it fails, under warranty

**NOTE:** All drives are protected by a Pre-Failure Alert when used with a HPE Smart Array controller and Systems Insight Manager, allowing hard drives to be replaced before failure under warranty. In addition, all drives are covered by a one or three-year limited on-site warranty period for the system in which they are installed. The drive warranty is automatically uplifted when used in a server or MSA for which a HPE Pointnext service contract is purchased. Please see the Support Services section below for additional services.

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### Smart Carriers

HPE Hard Drives with smart carriers are designed to provide an interface to communicate critical status and management information. System status LED icons and a spinning activity ring reflecting the data-writing process notify users of the current system status. A blue LED located behind the handle can be activated remotely to guide users to a specific drive tray, while a do-not-remove icon positioned on the tray's eject button lights up to warn users when the removal of the drive would cause data loss.

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### Helium Drives

Although hard drives are sealed, they have air inside. Air can create turbulence-induced risk vibrations which can limit the storage density of HDDs. Newer helium-filled drives virtually eliminate turbulence because helium is 1/7th as dense as air. This lower density allows the read/write mechanism to spin more easily and precisely, with less drag. Less internal turbulence means the drive platters can be closer together, allowing more platters and increasing the capacity potential in the same space. Less turbulence also means helium drives tend to use less power, and run cooler and quieter.

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### Support Matrix

Please see the following URL for the latest list of supported servers and enclosures:

**<https://www.hpe.com/us/en/servers/server-options.html>**

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### Warranty

Enterprise hard drives have a 3 year limited warranty regardless of the warranty period for the system in which they are installed. Midline hard drives have a 1 year limited warranty regardless of the warranty period for the system in which they are installed.

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## Service and Support

### Service and Support

#### HPE Technology Services for Industry Standard Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability powered by a rich portfolio of consulting and support services designed to add value to our core products and solutions connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

#### Protect your business beyond warranty with HPE Support Services

HPE support services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

**NOTE:** HPE Hard drives are covered under the HPE Pointnext /Service Contract applied to the HPE ProLiant Server. No separate HPE Pointnext s need to be purchased.

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#### Connect your devices to HPE

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%1 reduction in down time, near 100%2 diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization.

All of these benefits are already available to you with your server storage and networking products, securely connected to HPE support.

1. IDC Whitepaper
  2. HPE CSC Reports 2014-2015
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#### HPE Support Center

Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more

<https://support.hpe.com/hpesc/public/home>

HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Support Services or HPE contractual support agreement.

**NOTE:** HPE Support Center Mobile App above is subject to local availability.

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#### Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

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## Service and Support

### Service Coverage

For ProLiant servers and storage systems, the service on the main product covers HPE-branded hardware options not designated by Hewlett Packard Enterprise as requiring separate coverage, that are qualified for the server, purchased at the same time or afterward and internal to the enclosure. These items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been reached.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply to Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have reached maximum supported lifetime and/or the maximum usage limits as set forth in the manufacturer's operating manual, the product QuickSpecs, or the technical data sheet are not eligible for the defective media retention service feature option.

**Subject to:** Maximum supported lifetime: This is a period in years set to equal the warranty for the specific drive. After this period no further service coverage will be available for the drive. Maximum usage limit: This is the maximum amount of data that can be written to the drive. Drives that have reached this limit will not be eligible for services coverage.

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### For more information

To learn more on services for HPE Server Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:

<https://www.hpe.com/us/en/product-catalog/servers/proliant-servers.html> or

<https://www.hpe.com/us/en/integrated-systems/bladesystem.html>

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### Supporting Helpful Links

<http://www.hpe.com/info/rackandpower>

<http://www.hpe.com/info/poweradvisor>

<http://www.hpe.com/info/infrastructurearchitect>

<https://www.hpe.com/us/en/storage/entry-level.html>

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Technical Specifications

| Enterprise (15K rpm)            |                                                                                       |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                       | SFF (2.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                       | 15000 rpm                                        |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                       | SAS                                              |                         | Height                              | 0.62 in (15.6 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                       | 12Gb/sec                                         |                         | Width                               | 2.98 in (75.7 mm)                   |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                       | 512                                              |                         | Depth                               | 4.67 in (118.7 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                       | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                       | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 870753-X21                      | HPE 300GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD | 225                                              | 220                     | 220                                 | 220                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 870757-X21                      | HPE 600GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD | 225                                              | 220                     | 220                                 | 220                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| 870759-X21                      | HPE 900GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD | 260                                              | 220                     | 220                                 | 220                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |

## Technical Specifications

| Enterprise (15K rpm)            |                                                                                        |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                        | LFF (3.5")                                       |                         | Carrier                             | Smart Carrier Converter (SCC)       |                         |                          |                               |                                |
| Rotational Speed                |                                                                                        | 15000 rpm                                        |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                        | SAS                                              |                         | Height                              | 1.06 in (26.8 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                        | 12Gb/sec                                         |                         | Width                               | 4.16 in (105.8 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                        | 512                                              |                         | Depth                               | 6.69 in (170.0 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                        | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                        | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| P04695-B21                      | HPE 600GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD | 260                                              | 220                     | 220                                 | 220                                 | 5.6                     | 7.2                      | 7.7                           | 6.2                            |
| P04693-B21                      | HPE 300GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD | 260                                              | 220                     | 220                                 | 220                                 | 4.3                     | 6.9                      | 7.0                           | 6.4                            |

| Enterprise (15K rpm)            |                                                                                        |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                        | LFF (3.5")                                       |                         | Carrier                             | Low Profile Converter (LPC)         |                         |                          |                               |                                |
| Rotational Speed                |                                                                                        | 15000 rpm                                        |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                        | SAS                                              |                         | Height                              | 1.028 in (26.1 mm)                  |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                        | 12Gb/sec                                         |                         | Width                               | 4.15 in (105.5 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                        | 512                                              |                         | Depth                               | 6.16 in (156.58 mm)                 |                         |                          |                               |                                |
| Operating Temperature           |                                                                                        | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                        | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 870761-X21                      | HPE 900GB SAS 12G Enterprise 15K LFF (3.5in) LPC 3yr Wty Digitally Signed Firmware HDD | 295                                              | 235                     | 235                                 | 235                                 | 4.7                     | 6.1                      | 6.3                           | 6.4                            |

## Technical Specifications

| Enterprise (10K rpm)            |                                                                                            |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                            | SFF (2.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                            | 10000 rpm                                        |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                            | SAS                                              |                         | Height                              | 0.62 in (15.6 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                            | 12Gb/sec                                         |                         | Width                               | 2.98 in (75.7 mm)                   |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                            | 512                                              |                         | Depth                               | 4.67 in (118.7 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                            | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                            | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 872475-X21                      | HPE 300GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD      | 195                                              | 180                     | 180                                 | 180                                 | 3.8                     | 6.9                      | 6.1                           | 5.3                            |
| 872477-X21                      | HPE 600GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD      | 195                                              | 165                     | 165                                 | 165                                 | 4.7                     | 6.9                      | 6.3                           | 6.3                            |
| 872479-X21                      | HPE 1.2TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD      | 195                                              | 165                     | 165                                 | 165                                 | 4.0                     | 7.1                      | 6.4                           | 5.5                            |
| 872481-X21                      | HPE 1.8TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD | 230                                              | 165                     | 170                                 | 185                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 881457-X21                      | HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD | 255                                              | 160                     | 180                                 | 190                                 | 4.8                     | 6.0                      | 7.8                           | 6.6                            |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SAS                                              |                         | Height                              | 1.06 in (26.8 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 12Gb/sec                                         |                         | Width                               | 4.16 in (105.8 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               | 6.69 in (170.0 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                                | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 872485-B21                      | HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD              | 190                                              | 100                     | 100                                 | 100                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 872487-B21                      | HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD              | 190                                              | 100                     | 100                                 | 100                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 861754-B21                      | HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD                                   | 200                                              | 100                     | 105                                 | 110                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 819201-B21                      | HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD         | 230                                              | 105                     | 115                                 | 115                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| 857644-B21                      | HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 110                                 | 115                                 | 3.8                     | 5.8                      | 5.9                           | 5.0                            |
| 881779-B21                      | HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 115                                 | 125                                 | 5.5                     | 6.1                      | 7.0                           | 6.8                            |
| P09153-B21                      | HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 250                                              | 105                     | 115                                 | 120                                 | 5.3                     | 8.5                      | 7.4                           | 6.9                            |
| P23863-X21                      | HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD                            | 250                                              | 110                     | 120                                 | 125                                 | 5.23                    | 6.69                     | 8.01                          | 6.40                           |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             | Low Profile (LP)                    |                         |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SAS                                              |                         | Height                              | 1.028 in (26.1 mm)                  |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 12Gb/sec                                         |                         | Width                               | 4.15 in (105.5 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               | 6.16 in (156.58 mm)                 |                         |                          |                               |                                |
| Operating Temperature           | 50° to 95° F (10° to 35°C)                                                                     |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 833926-X21                      | HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD              | 200                                              | 110                     | 110                                 | 110                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 833928-X21                      | HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD              | 200                                              | 110                     | 110                                 | 110                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| 861746-X21                      | HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD                                   | 215                                              | 110                     | 115                                 | 120                                 | 4.7                     | 6.1                      | 6.3                           | 6.4                            |
| 834031-X21                      | HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD         | 230                                              | 105                     | 115                                 | 115                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| P09149-X21                      | HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 240                                              | 110                     | 120                                 | 125                                 | 5.0                     | 5.8                      | 7.3                           | 5.7                            |
| 881781-X21                      | HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 115                                 | 125                                 | 5.5                     | 6.1                      | 7.0                           | 6.8                            |
| P09155-X21                      | HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 250                                              | 105                     | 115                                 | 120                                 | 5.3                     | 8.5                      | 7.4                           | 6.9                            |
| P23608-X21                      | HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD                            | 250                                              | 110                     | 120                                 | 125                                 | 5.23                    | 6.69                     | 8.01                          | 6.40                           |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             | Standard Carrier (ST)               |                         |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SAS                                              |                         | Height                              | 1.04 in (26.4 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 12Gb/sec                                         |                         | Width                               | 4.36 in (110.7 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               | 7.43 in (188.7 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                                | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| P09151-B21                      | HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) ST 1yr Wty Helium 512e Digitally Signed Firmware HDD | 240                                              | 110                     | 120                                 | 125                                 | 5.0                     | 5.8                      | 7.3                           | 5.7                            |
| 881783-B21                      | HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) ST 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 115                                 | 125                                 | 5.5                     | 6.1                      | 7.0                           | 6.8                            |
| P24751-K21                      | HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) ST 512e ISE HDD                            | 250                                              | 110                     | 120                                 | 125                                 | 5.23                    | 6.69                     | 8.01                          | 6.40                           |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SATA                                             |                         | Height                              | 1.06 in (26.8 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 6Gb/sec                                          |                         | Width                               | 4.16 in (105.8 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               | 6.69 in (170.0 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                                | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 861691-B21                      | HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty HDD                                        | 185                                              | 90                      | 90                                  | 90                                  | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 872489-B21                      | HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD              | 185                                              | 90                      | 90                                  | 90                                  | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 872491-B21                      | HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD              | 190                                              | 100                     | 100                                 | 100                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 861750-B21                      | HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD                                   | 215                                              | 105                     | 105                                 | 110                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 819203-B21                      | HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD         | 230                                              | 105                     | 110                                 | 115                                 | 8.8                     | 12.1                     | 10.8                          | 10.5                           |
| 857648-B21                      | HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 110                                 | 115                                 | 3.8                     | 5.8                      | 5.9                           | 5.0                            |
| 881785-B21                      | HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 110                                 | 120                                 | 5.5                     | 6.1                      | 7.0                           | 6.8                            |

Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SATA                                             |                         | Height                              | 1.06 in (26.8 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 6Gb/sec                                          |                         | Width                               | 4.16 in (105.8 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               | 6.69 in (170.0 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                                | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| P09163-B21                      | HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD | 250                                              | 105                     | 115                                 | 120                                 | 4.9                     | 8.5                      | 6.9                           | 6.6                            |
| P23857-X21                      | HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD                            | 265                                              | 110                     | 120                                 | 125                                 | 4.73                    | 6.18                     | 7.65                          | 6.92                           |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                                |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                                | LFF (3.5")                                       |                         | Carrier                             |                                     | Low Profile (LP)        |                          |                               |                                |
| Rotational Speed                |                                                                                                | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                                | SATA                                             |                         | Height                              |                                     | 1.028 in (26.1 mm)      |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                                | 6Gb/sec                                          |                         | Width                               |                                     | 4.15 in (105.5 mm)      |                          |                               |                                |
| Bytes/Sector                    |                                                                                                | 512                                              |                         | Depth                               |                                     | 6.16 in (156.58 mm)     |                          |                               |                                |
| Operating Temperature           | 50° to 95° F (10° to 35°C)                                                                     |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                                | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 861686-X21                      | HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD              | 195                                              | 90                      | 90                                  | 90                                  | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 861681-X21                      | HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD              | 195                                              | 90                      | 90                                  | 90                                  | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 861683-X21                      | HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD              | 200                                              | 110                     | 110                                 | 110                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| 861742-X21                      | HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD                                   | 215                                              | 110                     | 115                                 | 115                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| 834028-X21                      | HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD         | 230                                              | 105                     | 110                                 | 115                                 | 4.7                     | 6.1                      | 6.3                           | 6.3                            |
| P09161-X21                      | HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 240                                              | 110                     | 120                                 | 125                                 | 4.7                     | 5.9                      | 7.6                           | 7.9                            |
| 881787-X21                      | HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 235                                              | 105                     | 115                                 | 125                                 | 5.5                     | 6.1                      | 7.0                           | 6.8                            |
| P09165-X21                      | HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD | 250                                              | 105                     | 115                                 | 120                                 | 4.9                     | 8.5                      | 6.9                           | 6.6                            |
| P23449-X21                      | HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD                            | 265                                              | 110                     | 120                                 | 125                                 | 4.73                    | 6.18                     | 7.65                          | 6.92                           |

Technical Specifications

| Midline (7.2K rpm)              |                                                                     |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|---------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                     | LFF (3.5")                                       |                         | Carrier                             | Standard Carrier (ST)               |                         |                          |                               |                                |
| Rotational Speed                |                                                                     | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                     | SATA                                             |                         | Height                              | 1.04 in (26.4 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                     | 12Gb/sec                                         |                         | Width                               | 4.36 in (110.7 mm)                  |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                     | 512e                                             |                         | Depth                               | 7.43 in (188.7 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                     | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                     | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| P24750-K21                      | HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) ST 512e ISE HDD | 265                                              | 110                     | 120                                 | 125                                 | 4.73                    | 6.18                     | 7.65                          | 6.92                           |

Technical Specifications

| Midline (7.2K rpm)              |                                                                                   |            |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|-----------------------------------------------------------------------------------|------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                   | SFF (2.5") | Carrier                                          |                         | Smart Carrier (SC)                  |                                     |                         |                          |                               |                                |
| Rotational Speed                |                                                                                   | 7200 rpm   | Dimensions                                       |                         |                                     |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                   | SAS        | Height                                           |                         | 0.62 in (15.6 mm)                   |                                     |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                   | 12Gb/sec   | Width                                            |                         | 2.98 in (75.7 mm)                   |                                     |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                   | 512        | Depth                                            |                         | 4.67 in (118.7 mm)                  |                                     |                         |                          |                               |                                |
| Operating Temperature           | 50° to 95° F (10° to 35°C)                                                        |            |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                   |            | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 832514-X21                      | HPE 1TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD |            | 130                                              | 105                     | 105                                 | 105                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 765466-X21                      | HPE 2TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e HDD                      |            | 130                                              | 105                     | 105                                 | 105                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |

## Technical Specifications

| Midline (7.2K rpm)              |                                                                                        |                                                  |                         |                                     |                                     |                         |                          |                               |                                |
|---------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                                                        | SFF (2.5")                                       |                         | Carrier                             | Smart Carrier (SC)                  |                         |                          |                               |                                |
| Rotational Speed                |                                                                                        | 7200 rpm                                         |                         | Dimensions                          |                                     |                         |                          |                               |                                |
| Interface                       |                                                                                        | SATA                                             |                         | Height                              | 0.62 in (15.6 mm)                   |                         |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                                                        | 6Gb/sec                                          |                         | Width                               | 2.98 in (75.7 mm)                   |                         |                          |                               |                                |
| Bytes/Sector                    |                                                                                        | 512                                              |                         | Depth                               | 4.67 in (118.7 mm)                  |                         |                          |                               |                                |
| Operating Temperature           |                                                                                        | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                         |                          |                               |                                |
| SKU                             | SKU Description                                                                        | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts) | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 655710-X21                      | HPE 1TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD      | 130                                              | 105                     | 105                                 | 105                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |
| 765455-X21                      | HPE 2TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD | 130                                              | 105                     | 105                                 | 105                                 | 2.6                     | 3.6                      | 4.4                           | 3.9                            |

## Technical Specifications

| Entry                           |                                                         |                                                  |                         |                                     |                                     |                           |                          |                               |                                |
|---------------------------------|---------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------|-------------------------------------|---------------------------|--------------------------|-------------------------------|--------------------------------|
| Form Factor                     |                                                         | LFF (3.5")                                       |                         | Carrier                             |                                     | Non Hot Plug Carrier (RW) |                          |                               |                                |
| Rotational Speed                |                                                         | 7200 rpm                                         |                         | Dimensions                          |                                     |                           |                          |                               |                                |
| Interface                       |                                                         | SATA                                             |                         | Height                              |                                     | 1.028 in (26.1 mm)        |                          |                               |                                |
| Transfer Rate Synchronous (Max) |                                                         | 6Gb/sec                                          |                         | Width                               |                                     | 4.00 in (101.6 mm)        |                          |                               |                                |
| Bytes/Sector                    |                                                         | 512                                              |                         | Depth                               |                                     | 5.75 in (146.0 mm)        |                          |                               |                                |
| Operating Temperature           |                                                         | 50° to 95° F (10° to 35°C)                       |                         |                                     |                                     |                           |                          |                               |                                |
| SKU                             | SKU Description                                         | OD Media Rate, Max Sequential Throughput (MiB/s) | 128Kib Random Rd (IOPs) | 128Kib Random 70% RD/ 30% WT (IOPs) | 128Kib Random 50% RD/ 50% WT (IOPs) | Power Idle Time (Watts)   | Power Random R/W (Watts) | Power Sequential Read (Watts) | Power Sequential Write (Watts) |
| 843266-B21                      | HPE 1TB SATA 6G Entry 7.2K LFF (3.5in) RW 1yr Wty HDD   | N/A                                              | N/A                     | N/A                                 | N/A                                 | 2.6                       | 3.6                      | 4.4                           | 3.9                            |
| 801882-B21                      | HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD | 160                                              | 95                      | 95                                  | 95                                  | 8.8                       | 12.1                     | 10.8                          | 10.5                           |
| 801888-B21                      | HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD | 160                                              | 90                      | 90                                  | 90                                  | 8.8                       | 12.1                     | 10.8                          | 10.5                           |

Technical Specifications

Carrier Decoder

HPE Hard Disk Drives (HDDs) utilize a wide variety of carriers, which houses the HDD and also enables a specific chassis fit to support a broad range of HPE server and storage products. The table below summarizes the various form factors, plug types, and carrier attributes.

| Carriers    |              |                 |                                      |         |
|-------------|--------------|-----------------|--------------------------------------|---------|
| Form Factor | HP/NHP       | Smart/Non-Smart | Carrier Name (Abbreviation)          | SFF/LFF |
| SFF Carrier | Hot Plug     | Smart           | Smart Carrier <b>(SC)</b>            | SFF     |
|             |              | Non-Smart       | Standard <b>(ST)</b>                 | SFF     |
| LFF Carrier | Hot Plug     | Smart           | Smart Carrier <b>(SC)</b>            | LFF     |
|             |              |                 | Smart Carrier Converter <b>(SCC)</b> | LFF     |
|             |              | Non-Smart       | Low Profile <b>(LP)</b>              | LFF     |
|             |              |                 | Low Profile Converter <b>(LPC)</b>   | LFF     |
|             |              |                 | Standard <b>(ST)</b>                 | LFF     |
| No Carrier  | Non-Hot Plug | Non-Smart       | Raw LFF HDD <b>(RW)</b>              | LFF     |

## Technical Specifications

|                                  |                                                |            | SFF Carriers              |                          |                       | LFF Carriers              |                           |                        |                       |                           |
|----------------------------------|------------------------------------------------|------------|---------------------------|--------------------------|-----------------------|---------------------------|---------------------------|------------------------|-----------------------|---------------------------|
| Server Family                    | Server Model                                   | Generation | Smart Carrier (SCI)/(SCC) | Smart Carrier NVMe (SCN) | Standard Carrier (ST) | Raw Carrier(RW)/(AKA NPH) | Smart Carrier (SCI)/(SCC) | Low Profile (LP)/(LPC) | Standard Carrier (ST) | Raw Carrier(RW)/(AKA NPH) |
| HPE Apollo                       | HPE Apollo Gen10 Series                        |            |                           |                          |                       |                           |                           |                        |                       |                           |
|                                  | HPE Apollo pc40                                | Gen10      |                           |                          |                       | Yes                       |                           |                        |                       | Yes                       |
|                                  | HPE Apollo sx40 Server                         | Gen10      |                           |                          |                       | Yes                       |                           |                        |                       | Yes                       |
|                                  | HPE Apollo 70 System                           | Gen10      |                           |                          |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 2000 Series                         |            |                           |                          |                       |                           |                           |                        |                       |                           |
|                                  | HPE Apollo XL170r Gen9 Server                  | Gen9       | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo XL170r Gen10 Server                 | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo XL190r Gen9 Server                  | Gen9       | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo XL190r Gen10 Server                 | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 4000 Series                         |            |                           |                          |                       |                           |                           |                        |                       |                           |
|                                  | HPE Apollo 4200 Gen9 Server                    | Gen9       | Yes                       |                          |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 4200 Gen10 Server                   | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 4500 System                         | Gen9       | Yes                       |                          |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 4510 Gen10                          | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|                                  | HPE Apollo 6000 Series                         |            |                           |                          |                       |                           |                           |                        |                       |                           |
| HPE ProLiant XL230k Gen10 Server | Gen10                                          | Yes        | Yes                       |                          |                       |                           |                           |                        |                       |                           |
| HPE Blades                       | HPE Blades                                     |            |                           |                          |                       |                           |                           |                        |                       |                           |
|                                  | HPE ProLiant BL460c Gen9 Server Blade          | Gen9       | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|                                  | HPE ProLiant BL460c Gen10 Server Blade         | Gen10      | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|                                  | HPE ProLiant BL660c Gen9 Server Blade          | Gen9       | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|                                  | HPE ProLiant WS460c Gen9 Graphics Server Blade | Gen9       | Yes                       |                          |                       |                           |                           |                        |                       |                           |

## Technical Specifications

|               |                                      |            | SFF Carriers              |                          |                       |                           | LFF Carriers              |                        |                       |                           |
|---------------|--------------------------------------|------------|---------------------------|--------------------------|-----------------------|---------------------------|---------------------------|------------------------|-----------------------|---------------------------|
| Server Family | Server Model                         | Generation | Smart Carrier (SCI)/(SCC) | Smart Carrier NVMe (SCN) | Standard Carrier (ST) | Raw Carrier(RW)/(AKA NPH) | Smart Carrier (SCI)/(SCC) | Low Profile (LP)/(LPC) | Standard Carrier (ST) | Raw Carrier(RW)/(AKA NPH) |
| HPE ProLiant  | HPE ProLiant DL                      |            |                           |                          |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant DL20 Gen9 Server        | Gen9       | Yes                       |                          |                       | Yes                       | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL20 Gen10 Server       | Gen10      | Yes                       |                          |                       | Yes                       |                           | Yes                    |                       |                           |
|               | HPE ProLiant DL120 Gen9 Server       | Gen9       | Yes                       |                          |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL120 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       | Yes                       |                           | Yes                    |                       |                           |
|               | HPE ProLiant DL160 Gen9 Server       | Gen9       | Yes                       |                          |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL160 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       | Yes                       |                           | Yes                    |                       |                           |
|               | HPE ProLiant DL180 Gen9 Server       | Gen9       | Yes                       |                          |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL180 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|               | HPE ProLiant DL325 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       |                           |
|               | HPE ProLiant DL360 Gen9 Server       | Gen9       | Yes                       | Yes                      |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL360 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL380 Gen9 Server       | Gen9       | Yes                       | Yes                      |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL380 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL385 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           | Yes                       |                        |                       |                           |
|               | HPE ProLiant DL 560 Gen9 Server      | Gen9       | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant DL 560 Gen10 Server     | Gen10      | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant DL 580 Gen9 Server      | Gen9       | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant DL 580 Gen10 Server     | Gen10      | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant ML                      |            |                           |                          |                       |                           |                           |                        |                       |                           |
|               | HPE ProLiant MicroServer Gen10       | Gen10      |                           |                          |                       | Yes                       |                           |                        |                       | Yes                       |
|               | HPE ProLiant ML30 Gen10 Server       | Gen10      | Yes                       |                          |                       |                           |                           | Yes                    |                       | Yes                       |
|               | HPE ProLiant ML110 Gen10 Server      | Gen10      | Yes                       |                          |                       |                           |                           | Yes                    |                       | Yes                       |
|               | HPE ProLiant ML350 Gen10 Server      | Gen10      | Yes                       | Yes                      |                       |                           |                           | Yes                    |                       | Yes                       |
| HPE Synergy   | HPE Synergy                          |            |                           |                          |                       |                           |                           |                        |                       |                           |
|               | HPE Synergy 480 Gen10 Compute Module | Gen10      | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE Synergy 660 Gen10 Compute Module | Gen10      | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE Synergy 680 Gen9 Compute Module  | Gen9       | Yes                       | Yes                      |                       |                           |                           |                        |                       |                           |
|               | HPE Synergy D3940 Storage Module     | N/A        | Yes                       |                          |                       |                           |                           |                        |                       |                           |

## Technical Specifications

### HDD SKU Description Decoder

#### Long Name

**HPE 10TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e HDD**

| Brand | Storage Capacity        | Interface Type/<br>Interface Speed | Workload                                                             | Form Factor Type /<br>Form Factor Size | Carriers                                                                                                                                                   | Wty.                               | Special Features                                           | Drive Type |
|-------|-------------------------|------------------------------------|----------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|------------|
| HPE   | 300-<br>900GB<br>1-16TB | SATA/SAS<br>6G/12G                 | Mission Critical 15/10K<br>Business Critical 7.2K<br>Entry 7.2K/5.9K | SFF (2.5IN)<br>LFF (3.5IN)             | SC Smart Carrier<br>SCC Smart Carrier<br>Converter<br>LP Low Profile<br>LPC Low Profile Converter<br>ST Standard<br>STC Standard Converter<br>RW Raw Drive | 3Yr <u>Wty.</u><br>1Yr <u>Wty.</u> | 512e<br>512n (No descriptor)<br><br>Special – Special SKUs | HDD        |

Note:  
Enterprise -> Mission Critical  
Midline -> Business Critical

### Environment friendly Products and Approach End-of life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **U**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

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## Summary of Changes

| Date        | Version History | Action  | Description of Change                                                                                                                                                                                                                |
|-------------|-----------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03-Feb-2020 | Version 16      | Changed | Added new HPE 16TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models.                                                                                                                                        |
| 02-Dec-2019 | Version 15      | Changed | Technical Specifications and Overview Sections were updated                                                                                                                                                                          |
| 03-Jun-2019 | Version 14      | Changed | Technical Specifications and Overview Sections were updated                                                                                                                                                                          |
| 04-Feb-2019 | Version 13      | Changed | Technical Specifications and Overview Sections were updated                                                                                                                                                                          |
| 15-Oct-2018 | Version 12      | Changed | Technical Specifications was revised.                                                                                                                                                                                                |
| 01-Oct-2018 | Version 11      | Changed | Overview, Standard Features, Service and Support, and Technical Specifications were revised.                                                                                                                                         |
| 04-Sep-2018 | Version 10      | Changed | Technical Specifications Section was updated                                                                                                                                                                                         |
| 04-Jun-2018 | Version 9       | Added   | P04695-B21 HPE 600GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD<br>P04693-B21 HPE 300GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD<br>Power specs for all drives |
|             |                 | Changed | Seek time specs to IOPs<br>From Recommended to Extended: 861590-B21, 861594-B21, 861596-B21<br>From Extended to Recommended: 801882-B21, 881787-X21                                                                                  |
| 05-Mar-2018 | Version 8       | Changed | Overview, Service and Support, and Technical Specifications were revised.                                                                                                                                                            |
| 05-Feb-2018 | Version 7       | Added   | Added new HPE 12TB Midline 7.2K SAS LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models: 881779-B21, 881781-X21, 881783-B21                                                                                                 |
|             |                 | Changed | Change format to breakout recommended and extended portfolios.                                                                                                                                                                       |
|             |                 | Removed | Obsolete SKUs                                                                                                                                                                                                                        |
| 04-Dec-2017 | Version 6       | Added   | Added new HPE 12TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models.                                                                                                                                        |
|             |                 | Changed | Overview, Service and Support, and Technical Specifications were revised.                                                                                                                                                            |
|             |                 | Removed | Obsolete SKUs were removed from the QuickSpecs.                                                                                                                                                                                      |
| 23-Oct-2017 | Version 5       | Changed | Part number 881458-B21 was changed to 881457-X21.<br>Care Pack references changed to HPE Pointnext operational services.                                                                                                             |
| 25-Sep-2017 | Version 4       | Added   | Added 881458-B21 HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD                                                                                                                          |
|             |                 | Changed | Overview, Standard Features, Service and Support, and Technical Specifications were revised.                                                                                                                                         |
| 12-Jun-2017 | Version 3       | Changed | Overview and Technical Specifications were revised.                                                                                                                                                                                  |
| 27-Mar-2017 | Version 2       | Added   | Added new HDD offering.                                                                                                                                                                                                              |
|             |                 | Changed | Overview and Technical Specifications were revised.                                                                                                                                                                                  |
| 13-Feb-2017 | Version 1       | Added   | Combined SAS and SATA into one single QuickSpecs. Overview, Models, Compatibility, Standard Features, Service and Support, and Technical Specifications sections were updated. New part number descriptions have been added.         |

## Summary of Changes



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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

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