## Overview

### HPE XP8 Storage

HPE XP8 Storage is a mission critical flash storage for enterprises requiring Tier-0 enterprise storage for mission-critical apps that require absolutely zero downtime. XP8 is the 8th generation in the very successful XP product line. The previous generation XP7 Storage was designed as a 7-nines architecture and did not have a single second of downtime across the entire installed base since launch in April'2014, delivering on the 100% data availability guarantee. The XP8 Storage takes this a step forward, XP8 Storage is designed for 8-nines of availability. XP8 also delivers more than 4 times improvement in performance compared to XP7 and has an intelligent management suite of software for simplified management and proactive support.

The XP portfolio contains a robust set of software that drastically reduces storage management and provisioning complexity as well as delivering advanced multi-datacenter high availability, migration, and automation. The essential software for provisioning and managing the storage array is included along with the XP8 Storage controller, making it simpler and economical to purchase software.

Together, XP8 hardware and software deliver unmatched availability, performance, and scale. Rest easy knowing that XP8 will always be online. No downtime for any reason, and backed up the XP8 100% data availability guarantee.

HPE XP8 is available in two models: HPE XP8 All-Flash Storage Array and HPE XP8 Hybrid Array. Both models can be purchased in either Base (2 controller) or Performance (4 controller) versions, and can scale up to a fully-loaded 12 controller configuration.

For more information about HPE XP8 visit**: hpe.com/storage/hpeXP8**

**HPE XP8 Storage**

**Models**

| SKU Description | SKU |
|---|---|
| HPE XP8 Hybrid Storage Array | R0L99A |
| HPE XP8 All Flash Storage Remanufactured Array | R0K99A |

## Standard Features

| HPE XP8 Storage | | | |
|---|---|---|---|
| **Scalability of the HPE XP8XP8** | | | |
| | **Min** | **increment** | **Max** |
| **DKC (Disk Controller Chassis)** | 1 Pair | 1 Pair | 3 Pair |
| **Controllers** | 2 | 2*/4 | 12 |
| **Racks** | 1 | 1 | 6 |
| **Data Drives SFF** | 0 | 4 | 2304 |
| **Data Drives LFF** | 0 | 4 | 1152 |
| **Data Drives SSD** | 0 | 4 | 2304 |
| **Data Media Modules FMD** | 0 | 4 | 576 |
| **Data Drives NVMe** | 0 | 4 | 288 |
| **Spare Media** | 0 | 1 | 192 |
| **SBX (SFF Media Chassis)** | 0 | 1 | 24 |
| **UBX (LFF Media Chassis)** | 0 | 1 | 12 |
| **NBX (SFF NVMe Media Chassis)** | 0 | 1 | 3 |
| **FBX (FMD Media Chassis)** | 0 | 1 | 12 |
| **Capacity** | 0 GB in a diskless configuration | Single parity group of 4 or 8 HDD, SSD or FMD | 69.1 PB raw<br>~60 PB useable |
| **SAS I/O Backend Module 4 pack** | 0 | 1 | 6 |
| **NVMe I/O Backend Module 4 pack** | 0 | 1 | 6 |
| **Encrypted SAS I/O Module Backend 4 pack** | 0 | 1 | 6 |
| **16 Gbps FC Host Ports** | 8 | 8 | 192 |
| **32 Gbps FC Host Ports** | 8 | 8 | 192 |
| **10GBps iSCSI Ports** | 4 | 4 | 96 |
| **16 Gbps FICON Host Ports** | 8 | 8 | 192 |
| **Cache** | 256 GB (8 x36 GB) | 256 GB (8 x 32 GB) | 6 TB |
| **LDEVs** | 0 | 1 | 65,280 |
| **NOTE:** * 2 Controller increment if upgrading from Base to Performance DKC. | | | |

**Drive Chassis (DKU)/ Media Chassis – DKU**

Four types of media chassis are available:

- SFF HDD/SSD Chassis for 2.5-inch media – Referred to as an SBX.
- LFF Drive Chassis for 3.5-inch drives – Referred to as an UBX.
- FMD Chassis for Flash Module Devices (FMD) – Referred to as an FBX.
- SFF NVMe Chassis for 2.5-inch media – Referred to as an NBX

## Standard Features

**Disk Controller Chassis –DKC**
XP8The Disk Controller Chassis (DKC) is offered in two models and always in pairs. The Base Disk Controller Chassis pair is the entry model and contains one controller board in each DKC. This Base model is ideal for customers that require 100% availability, but have less stringent performance requirements. For those customers that require more IOPs the Performance Disk Controller Chassis pair comes with four controllers, 2 in each DKC. Customers that initially purchase the Base DKC can upgrade to the Performance DKC as needs grow.

Both Base and Performance DKC models ship with an MPU (Microprocessor Unit), cache, one Service Processor (SVP) and SSVP, Backup Memory Kit (BKM) , Cooling Fans and AC-DC Power Supplies.

Batteries and cache flash memories are installed in the Cache Backup Module Kit (BKM) to prevent data loss due to the occurrence of a power outage.

The options which can be added or configured to a Disk Controller Chassis (DKC) consist of Channel Host Boards (CHB), and cache. An optional SVP is available for continuous management access to the array.

The storage system continues to operate when a single point of failure occurs. In addition, the replacement of the components and the upgrading of the microcode can be performed while the storage system is in operation.

The SVP provides for managing and modification of the storage system configuration information, and observes the operational status. Connecting this SVP to HPE C-Track enables the remote monitoring of the storage system. An Option SVP may be added to provide storage management and monitoring continuity in case of the main SVP fails and need to be replaced.

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**SBX**: The SFF Drive Chassis is a chassis to install the SFF media, and consists of SAS SW boards and the AC-DC Power Supplies equipped with built-in cooling fans.

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**UBX**: The LFF Drive Chassis is a chassis to install the LFF disk drives, and consists of SAS SW boards and the AC-DC Power Supplies equipped with built-in cooling fans.

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**FBX**: The FMD Chassis is a chassis to install Flash Module Devices, and consists of SAS SW boards and the AC-DC Power Supplies equipped with built-in cooling fans.

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**NBX**: The NBX Drive Chassis is a chassis to install the SFF NVMe media, and consists of PCIe SW boards and the AC-DC Power Supplies equipped with built-in cooling fans.

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## Standard Features

**Channel Host Boards– CHB**

Channel Host Board (CHB) pairs provide connections to host or servers that use the HPE XP8 for data storage (either directly connected to the servers or through SAN switches). CHB pairs also provide connections to External Storage and remote replication devices. CHBs are configured in pairs for redundancy. A minimum of 1 CHB pair is required. The maximum number of CHB pairs that can be installed in an XP8 is 24 providing 192 ports for host connectivity.

Max 4 CHB pair with a 2DKC 2CTL array

Max 8 CHB pair with a 2 DKC 4CTLarray

Max 16 CHB pair with a 4 DKC 8CTL array

Max 24 CHB pair with a 6 DKC 12CTL array

CHB pairs and transceivers available for use in the HPE XP8 include:

| Fibre Channel | HPE XP8 16/32Gb 4-port Fibre Channel 2-pack Host Bus Adapter |
|---|---|
| iSCSI | HPE XP8 10Gb 2-port iSCSI 2-pack Host Bus Adapter |
| FICON SW | HPE XP8 16Gb 4-port Mainframe Short Wave Fibre Channel 2-pack Host Bus Adapter |
| FICON LW | HPE XP8 16Gb 4-port Mainframe Long Wave Fibre Channel 2-pack Host Bus Adapter |
| LW | HPE XP8 16Gb SFP Long Wave 2-pack Transceiver |
| SW | HPE XP8 16Gb SFP Short Wave 2-pack Transceiver |
| SW | HPE XP8 32Gb SFP Short Wave 2-pack Transceiver |

The Fibre Channel CHB pair uses SFP (small form factor pluggable) Transceivers on each port of the CHB. Each port is configurable as short wave or long wave by installing the appropriate transceiver.

**Disk Controller Board – DKB**

The Disk Controller Board (DKB) performs all data movement between the drives and Cache Memory. The HPE XP8 may have zero DKB pairs (for an all External Virtual Storage configuration), and from four to 16 DKB pairs for internal storage media connection depending on the number of DKC's. DKB's are determined solely on the number of DKC's in the array. DKB's are available for both SAS and NVMe configurations.

**Encryption Ready Disk Controller Board – E-DKB**

The HPE XP8 encryption option requires the Encryption Ready Disk Adapters as well as an encryption software license. Data encryption occurs at the DKA device resulting in encrypted data at rest (DARE) on the drive/media. A SAS DKB is available at launch with the NVMe DKB available at later date.

Please see the software section for information on the HPE XP8 DKA Encryption Software LTU.

**Cache Memory**

Cache Memory is used to temporarily store data from the host until it is written to drive storage, or to stage data requested by the host from a drive. The HPE XP8 contains global mirrored cache. All write data is duplicated in both cache clusters. Cache control data (Shared Memory) and Cache data is also backed up to SSD for each Cache Memory Adapter in case of power outage (back up battery installed by default) or DKC power off.

This insures that even if one cache board fails that the data is still in the other one until it is safely written to a drive. Read data is not mirrored as a copy of that data remains on the drives, allowing more of the total cache capacity available for data.

HPE XP8 Cache Memory can be configured into logical partitions allocated to particular host/port combinations to ensure that those hosts/ports enjoy optimized performance of cache-oriented I/O. These cache partitions are assigned to specified Array Groups. Up to 32 partitions of at least 4GB can be created in a HPE XP8. Assigning cache in this way provides another method for tuning performance for data access for performance critical applications.

## Standard Features

**Media: HDD / SSD Drives and Flash Modules**
The HPE XP8 supports a variety of 2.5" small form-factor hard disk drives and solid state drives (SSDs), 3.5" large form-factor hard disk drives, and XP Flash Module Device. The number and type of media installed in a HPE XP8 is flexible. Media must be added in minimum groups of four. Additional capacity can be installed over time as capacity needs grow. The HPE XP8 media use the industry standard dual ported 12 Gbps SAS interface or NVMe PCIe interface. Each media is connected to both blades of the redundant DKA pair by separate connections. Spare media are automatically used in the event of a media failure.

SSDs have a limited number of writes that can occur before reaching the SSD's write endurance limit. The write endurance limit of enterprise MLC SSDs is generally high enough so wear out will not occur during the expected service life of an HPE XP under the great majority of configurations, IO patterns, and workloads. The HPE XP8 tracks all writes to SSDs and can report the percent of the total write limit that has been used. This allows any SSD approaching the write limit to be proactively replaced before they are automatically spared out.

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**Flash Module Device (FMD)**
The HPE XP8 supports Flash Module Device's (FMD), which provide solid-state non-volatile high-performance data capacity. FMD capacity can be configured for use in the array in the same way as any other HDD or SSD. The number of FMDs that can be installed in a HPE XP8 is flexible. FMDs must be added in groups of four or more. Additional capacity can be installed over time as capacity needs grow. Spare FMDs are automatically used in the event of a FMD failure.

The FMD compression engine delivers double the flash capacity (2:1 compression ratio) along with world class performance and makes mission critical flash more affordable.

Up to four 48 slot FMD Chassis may be configured to each DKC pair. FMD Chassis use the industry standard dual ported 12 Gbps SAS interface. Each FMD Chassis is connected to both blades of the redundant DKA pair by separate connections.
**NOTE:** The FMD is supported in Mainframe environments, but with FMD compression turned off.

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**Service Processor**
The Service Processor (SVP) manages the HPE XP8 configuration, gathers statistical information, and is used for some maintenance activities.

The HPE XP8 Storage does not require a functioning SVP in order to make capacity available for reading and writing. However, as external management functions have become dependent on the availability of the SVP in the HPE XP8, some customers may desire to have fast recovery from an SVP failure by having a standby SVP. If the primary SVP fails, the hot standby SVP is switched into operation automatically within approximately six minutes.

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**Continuous Track Remote Support**
The HPE Continuous Track (C-Track) remote support solution uses internet connectivity to transmit heartbeats, system information messages (SIMs), and configuration information to the HPE Storage Technology Centers (STCs) for remote data collection and remote monitoring purposes.

C-Track also enables the STCs to remotely diagnose certain issues that may exist on the HPE XP8. With Hewlett Packard Enterprise secure remote device access, Hewlett Packard Enterprise support personnel have the enhanced ability, in many cases, to quickly fix a support issue entirely through remotely performed actions.

The HPE XP8 Continuous Track remote support functions require connection to HPE Insight Remote Support via the internet.

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**Server connectivity**
The HPE XP8 connects to a variety of servers and operating systems. For details on which servers and operating systems are currently supported, please contact your sales representative.

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## Standard Features

**Switch support details**
The HPE XP8 connects to the leading Fibre Channel, and iSCSI switches in the industry today. For detailed information on supported switch configurations, please contact your sales representative.

**Application Solutions**
HPE XP8 is the newest member to the HPE XP Storage family that has been shipping for over 20 years. Over that time XP Storage earned a reputation for superior availability, performance, and scale. The HPE XP8 is ideal for customers running Oracle, Microsoft, SAP, and Vmware environments that simply cannot afford any downtime or tolerate any data loss.

The HPE XP8 provides these mission critical application environments with a complete hardware/ software storage solution to decrease risks, lower costs, and accelerate business growth and agility. Data replication and tightly integrated clustering solutions, along with disaster recovery support, enable a multi-site disaster tolerant design to achieve business continuity in the most mission-critical environment.

The HPE XP8 is the premier enterprise-class storage solution for database environments that demand a mission critical solution to meet business and storage demands of Oracle, Microsoft, SAP, and Vmware environments with technology that helps drive business success and mitigates risk with constant data availability.

Hewlett Packard Enterprise has developed an in-depth understanding of Oracle, Microsoft, SAP, and Vmware technologies by extensive lab-testing best practices with the HPE XP8 Storage, HPE servers, and management software; high availability and disaster recovery solutions; and backup and recovery on the Oracle, Microsoft, and SAP application platforms. As a result, our customers can expect a wide range of operational and business benefits where they can:

- Maintain Hardware Redundancy. Every active component within an HPE XP8 array is redundant, hot-swappable, and can be upgraded online.
- Achieve Data Loss Protection to monitor the array around the clock for unseen issues, and investigate and resolve problems proactively and immediately.
- Increase utilization efficiency and reduce storage costs with HPE XP8 Smart Tiers, HPE XP8 Thin Provisioning and HPE XP8 data reduction technologies.
- Increase return on investment with reduced cooling and power requirements along with increased reliability and storage density with HPE Smart Tiers.
- Maximize performance and consistent low response times with HPE XP8 ultra high performance configurations and HPE XP8 Flash Module Devices.
- Easily integrate to existing Oracle, Microsoft, SAP, and Vmware environments with choice of FC, iSCSI, NVMe or SAS attached controllers.

To learn more about specific HPE Storage Solutions that are built with Oracle, Microsoft, SAP, and Vmware environments in mind, visit the Storage Solutions for Mission Critical Applications site:
**https://www.hpe.com/us/en/storage/mission-critical-applications.html**

## Standard Features

**HPE XP8 Software Products**
The HPE XP8 family offers a complete portfolio of software applications designed to help you confidently manage and maximize availability, performance, and scale of your HPE XP8 Storage. For convenience all essential XP8 software is included as part of the array purchase. Remote replication and other advanced software is still optional, and purchased individually.

For additional information regarding HPE XP8 Software products, refer to the following:

- Trial licenses are available for most HPE XP8 software products. Please contact your HPE Sales Representative for details.
- For more information on HPE XP8 Software, please refer to the HPE XP8 Licensing compendium.

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**Base software suite bundled with XP8 Storage**
The HPE XP8 essential software suite RTU (right to use) is included with the purchase of the XP8 array. Management SW features from the prior generation HPE XP7 are included (except for CVAE Device and Replication Manager) plus the new Intelligent Storage Manager (ISM) and Data Protection Manager (DPM).

Included titles and features.

**Intelligent Storage Manager** is a unified configuration management tool that reduces the complexity of managing HPE XP storage systems. HPE Intelligent Storage Manager's intuitive Graphical User Interface shortens the learning curve, and allows users to get at-a-glance status of XP storage resources. Built-in configuration intelligence provides best-practice recommendations to help users simplifying deployment, management, and maintenance. Quickly and easily create parity groups, pools, volumes and then set their replication policies for up to 50 XP storage systems. Intelligent Storage Manager reduces complexity, and the effort required to manage storage resources, allowing for more time to focus on strategic initiatives.
Improve storage administrator productivity by reducing complexity and simplifying management

- Intelligent Storage Manager's intuitive GUI streamlines storage life-cycle tasks. Deploy, monitor, and tune storage infrastructure using just a few clicks of the mouse. Use recommended best practices to simplify deployment and get it right the first time.
- Use the comprehensive dashboard view to quickly assess storage infrastructure health. See alerts for HW issues, capacity, and data protection. Drill down to individual storage resources to view used and available capacity. If action is needed, tasks which sometimes took hours and days can now be done in minutes with a few clicks to the mouse.
- Integrate Intelligent Storage Manager easily integrates into existing environments with no disruption. The REST-API interface allows easy integration with existing infrastructure management tools, and lessens the learning curve.
- Improve storage administrator productivity by reducing complexity and simplifying management
- Single management interface to manage all storage lifecycle needs. No need for multiple tools and differing resource skills to manage them.
- Deploy new or modify existing configurations in a fraction of the time.

Create and deploy service level profile tiers to match SLA requirements. Deploy only the profile that is required, no more or less**.**

**HPE Data Protection Manager** is the answer for implementing contemporary data protection and copy management to improve data availability, compliance, governance, agility, and costs. HPE Data Protection Manager enables administrators for create policies and workflows to automate replication and copy data management, removing vast amounts of complexity and the need to create and manage custom scripts. Copy data configurations that sometimes took weeks to deploy can now be done in minutes. Its whiteboard-like GUI make it easy to create and manage replication and copy services to meet quality of service requirements. Data Protection Manager tightly integrates copy services with applications to ensure application and crash consistent backup.

HPE Data Protection Manager is structured into three sub-products; Storage Replication, Storage File System Protection, and Storage Application Protection. Storage Replication is bundled into the Intelligent Management Suite included with the purchase of the array. File System Protection and Application Protection offered as optional.

## Standard Features

**Array Manager software** provides web-based volume management, resource allocation, access control, and data security for your HPE XP8 Storage. Configure and manage data volumes for most effective use of your HPE XP8. Partition array resources to isolate applications, reserve cache memory for your most frequently accessed data, and control host port usage so that your most critical applications have the port bandwidth they need. Configure, manage, and secure all host access to the HPE XP8 so that you have efficient access to your data. Create read-only volumes for archiving and data retention, and securely delete your data when necessary.

**Thin Provisioning software** allows you to supply storage capacity to your applications from a pool of virtualized storage. By enabling you to allocate your anticipated future storage capacity needs from virtual storage, HPE XP8 Thin Provisioning Software reduces the amount of physical drive capacity initially required. As utilization of physical drive space increases over time, you can purchase more drive capacity as it is needed, and install it without affecting your applications. By removing the guessing from capacity planning, HPE XP8 Thin Provisioning reduces the cost of volume management.

**Resource Partition** allows role based access control of HPE XP8 resources. It allows storage administrators to partition HPE XP8 resources, at physical and logical level and to assign these resources to sub-administrators while retaining overall control. Administrators can partition a HPE XP8 Storage at a physical level (ports, hosts, LDEVs and Parity Groups) and dedicate part of their arrays for specific requirements. They can also partition at a logical level (Host Groups and LDEVs) and keep Ports, Parity Groups and External Storage as a shared infrastructure. Resource Partition software is ideal for a multi-tenant environment set up where dedicated sub-administrators need to manage the IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator retain complete control of HPE XP8 Storage resources. Datacenter administrators can decide to partition HPE XP8 Storage resources either at a logical level to improve storage utilization efficiency or at a physical level to improve quality of service and avoid data and access breaches across multiple tenants.

**External Storage** allows you to host HPE XP8 Storage LUNs on select external storage subsystems. HPE XP8 External Storage allows you to tier storage capabilities and provision a HPE XP8 solution to optimize return on IT investment - letting you focus high-performance/high availability native HPE XP8 Storage capacity against your most mission-critical data while hosting less critical data on cost optimized external storage subsystems. Data stored on external devices connected behind a HPE XP8 appear to a server to be stored inside the HPE XP8.

External Storage provides significant consolidation scalability - up to 255 Petabytes (PB) of external storage can be configured behind a single HPE XP8 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your HPE XP8 solution to simplify configuration complexity and reduce ongoing management cost. HPE

External Storage is compatible with a wide range of HPE XP8 software tools, including HPE XP8 Business Copy for local replication, HPE XP8 Continuous Access for remote replication, and HPE XP8 Auto LUN for performance optimization.

HPE XP8 Command View Advanced Edition Software provides centralized, web-based management for HPE XP8 Storage. It reduces total cost of ownership by enabling collaboration among team members and by increasing the efficiency of storage administrators.
Note: An additional external capacity LTU is required. See R0W57A for requirements

**Business Copy** makes nearly instantaneous copies of data from HPE XP8 Storage for development, testing or backup, without ever interrupting your online production. HPE XP8 Business Copy creates and maintains RAID-protected copy volumes without interrupting access to the source volumes. Because it makes asynchronous copy volume updates, copies stay up to date with minimal I/O response time degradations for your primary applications. These copy volumes can at any time be "split" from their corresponding source volume and accessed by other applications. Therefore, while copy volumes are being utilized, primary applications can continue to access and update their source volumes as needed, without taking a performance hit. By creating multiple online copies of critical business data without disrupting your business, HPE XP8 Business Copy lets you get the most from your data.

**Fast Snap** is a feature of Business Copy that also replicates data volumes. However, it is slightly different in that it makes space-efficient secondary copies that might only be a fraction of the size of the primary copy. Only data that is about to be overwritten in the primary volume is written to the secondary volume. This is called Copy-after-Write. As a result, if the volume capacity required for Snapshot HPE XP8 can be smaller, then the cost of replication can be lowered. Fast Snap is recommended for application environments where the I/O to the secondary volume is not write-centric or intensive (reads or writes).

## Standard Features

**Software compression and dedupe** for post process data reduction. Reduces bit cost and overall TCO for HPE XP8 storage Data reduction applicable on all media – FMD, HDD, SSD and external storage. Works in conjunction with DKC encryption.

**Remote Web** Console provides basic single HPE XP8 Storage management. It can be easily accessed by the HPE XP8 Command View AE GUI. If Remote Web Console is used as the only array device manager, it is accessed via a remote IP URL to the SVP. (See user manual for more details). Also note that the SVP shipped with HPE XP8 Storage includes a native CLI/SMI-S provider.

**Smart Tiers and Smart Tiers for Mainframe** improves storage performance and controls costs by transparently migrating data to appropriate tiers of storage within the HPE XP8 Storage. Smart Tiers manages data in thin provisioning pools. It monitors performance at the page level and can migrate data online to a different tier, automatically or manually, based on policies. Smart Tiers supports up to three tiers per pool. Smart Tiers supports external storage, which allows users to setup inexpensive external storage as one of the storage tiers for infrequently accessed data. RAID 1, RAID 5 and RAID 6 are supported.

**Smart Tier and Real Time Tiering Smart Tier for Mainframe** further enhances its tiering capability through real time tiering enhancement. Apart from period based tiering ranging from 30 minutes to 24 hour cycle, with real time tiering, the cycle time is reduced to seconds and sub-seconds level providing rapid response to workload changes. This is specifically beneficial for applications which experience a sudden surge in usage and require the Smart Tier monitor cycle to be less than 30 minutes to respond rapidly to the sudden increase in application usage.

**Smart Manager for Mainframe** runs on z/OS and provides centralized management of Smart Tiers volumes in a mainframe environment. It works together with Smart Tiers to help mainframe users conveniently and easily manage the location of volumes by tier. It allows mainframe storage administrators to transparently manage the location of volumes in a Smart Tiers pool such that SLA requirements can be satisfied. With Smart Manager for Mainframe your storage resources can be further optimized and efficiently utilized.

**Auto LUN Software** provides web-based automatic or manual monitoring and load balancing for all your HPE XP8 Storage. Now you can make the most of your arrays by moving high-priority tasks to underutilized volumes, replicating volumes for backup and recovery, and viewing the health of your arrays. You set performance goals, you set the limits, and HPE XP8 Auto LUN does the rest. It proposes a migration plan and even estimates how much your storage performance will improve when it is done. HPE XP8 Auto LUN lets you evaluate array usage and determine whether resources are overloaded or out of balance. Use its easy-to-follow menus to define when data is collected and arrays are monitored. It makes spotting trends simple, using up to 90 days of stored historical data to create up-to-the-minute reports. You can even export data to third-party analysis tools like Microsoft Excel. If resources are overloaded, HPE XP8 Auto LUN will create a plan to move volumes, then stands by for your approval to make changes.

**DLM Advanced for VMware**, HPE XP8 DLM Advanced for IBM AIX, HPE XP8 DLM Advanced for Sun Solaris, HPE XP8 DLM Advanced for Windows, and HPE XP8 DLM Advanced for Linux are server-based software tools that provide I/O path failover and load balancing for your HPE XP8s. They offer load balancing to improve performance, while the software's automatic error detection features provide a fault-tolerant infrastructure to avert data stoppages or catastrophic halts. It automatically routes I/Os to an alternate path, and administrators see and manage all I/O activity via an easy-to-use graphical interface - while users see only reliable system performance.

**Global Link Manager** uses multipath management software path control functionality to provide integrated path management for large sized system configurations. While multipath management software manages paths for a host, HPE XP8 Global Link Manager batch manages paths for multiple hosts.

When you use a large sized system configuration containing many hosts, the workload for managing paths from each host grows in proportion to the size of the system. Global Link Manager enables you to reduce the workload by providing unified management of the path information for the multiple hosts.

## Standard Features

**FlashCopy® Mirroring Software** provides snapshot capability for local copy of mainframe volumes. It enhances data availability for mainframe data and improves productivity by providing IBM FlashCopy® compatible point-in-time copies within an HPE XP8 Storage. As soon as a copy is created, it becomes available for use. The copy can be either virtual or physical. If a virtual copy is specified, it remains a pointer-based copy that only saves the changes from the original. However, if a physical copy is specified, a full copy will be completed in the background while both the source and the copy remain available for access.

For additional availability, FlashCopy® can be combined with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe, and HPE XP8 for Compatible Extended Remote Copy.

**FlashCopy® Space Efficient** - Storage space required by copies can be reduced with FlashCopy® Space Efficient. FlashCopy® SE uses space based on actual data being copied, not based on the S-VOL size, thus reducing the physical capacity used for T-VOLs. which are managed as a track space efficient (TSE) volume. The TSE is a thin provisioned volume subtype for use with FlashCopy® SE. Only the NOCOPY option can be used with Space Efficient FlashCopy® and a whole volume must be used as the S-VOL and T-VOL.

**Other base software highlights**

**LUN Manager**

Add paths, delete paths, set host mode, set/reset command device, configure ports, create LUNs and assign them to ports, configure port security, prevent IOSCAN by unauthorized servers from finding secure LUNs, and check every I/O for proper security.

**Supported Systems:** Open Systems

| | | |
|---|---|---|
| Open Volume Manager | Open Systems | Create expanded volumes that are larger than standard volumes (also called LU Size Expansion or LUSE), and create custom size volumes that are smaller than standard volumes (also called Custom Volume Size or CVS). |
| Virtual LVI (VLVI) | Mainframe | Create custom size mainframe volumes that are smaller than standard volumes. Also called Custom Volume Size or CVS. |
| Data Retention Utility | Open Systems | LUN access control, enabling archiving and data retention. Protect key files from being updated, copied, accessed, or queried. Also known as LUN Security XP Extension. |
| Cache Residency Manager for Mainframe | Mainframe | Improve performance by reserving areas of Cache Memory for frequently accessed data. |
| Volume Retention Manager for Mainframe | Mainframe | Volume access control, enabling archiving and data retention. Assign access permissions (read/write, read-only, and protect) to mainframe volumes. |
| Performance Control | Open Systems | Allocate disk array port I/Os and transfer rate so that your most important applications have the performance they need. Also known as Server Priority Manager. |
| Performance Monitor | Both | Monitor usage, workload, and performance of drives, volumes, processors, and host interfaces in the HPE XP7 Storage. View the information in graphical formats |
| Volume Shredder | Both | Securely delete data with repetitive overwrites to minimize the likelihood that it could be recovered. Overwrite up to eight times with random or user selected patterns. Also known as Data Shredder. |
| RAID Manager | Both | Host based command line interface that controls HPE XP7 Continuous Access, HPE XP7 Business Copy, and Data Retention Utility (LUN Security XP Extension). |
| Cache Partition | Both | Improve performance by reserving areas of cache to store frequently accessed data. Divide Cache into up to 32 partitions and configure dedicated Cache for critical applications to improve their performance. |
| MF performance collector | Mainframe | Improves the time and precision in analyzing mainframe performance data from host and storage |
| HPE XP7Info (Previously known as XPInfo) | Open Systems | Understand the mapping between device files on the server and their associated storage ports and LDEVs in the HPE XP7 by using the HPE XP7Info command line utility. |

## Standard Features

### Optional Software

**HPE XP8 Automation Director**

HPE XP8 Automation Director Software is the answer to unlocking the full potential of storage administration teams. It utilizes a service delivery automation engine that catalogs routine and repetitive tasks, as well as advanced processes, for quick, repeatable, and predictable storage service delivery. This software enables an innovative approach to storage infrastructure management. Automatically or with a few clicks of the mouse, quickly provision, replicate, analyze, and customize your environment. It comes with a service catalog of pre-optimized templates using proven best practices. Templates are customizable using Service Builder to tune for your workloads, such as SAP®, Microsoft®, Oracle®, OpenStack®, and VMware®.

Intelligent automation with HPE XP8 Automation Director Software simplifies storage infrastructure management, improves productivity, reduces cost, and frees up resources for strategic innovation.

**Product Highlights**

- Automated storage provisioning will improve costs and quality by simplifying storage administration
  - HPE XP8 Automation Director replaces repetitive time consuming tasks and complex workflows with easy to use templates. Provisioning becomes completely automated or as simple as a few mouse clicks.
  - Human error is often a leading contributor to downtime. XP8 Automation Director virtually eliminates human error by replacing mundane repetitive tasks with a service template for repeatable, reliable, and predictable outcomes. Provision automatically, and with confidence.
- Quickly provision storage by selecting from a catalog of best-practice-tuned templates.
  - HPE XP8 Automation Director eliminates complexity and accelerates provisioning by providing a pre-populated catalog of templates that were created using known best practices across a variety of common workloads.
  - Respond rapidly to new requests for storage, even if it's for an application new to the environment. For example, if the request is for a virtualized environment, select and deploy a template from the XP8 Automation Director Service Catalog with best practices based on VMware.
- Create customized service templates from scratch or tune existing templates with Service Builder.
  - HPE XP8 Automation Director comes with a robust catalog of pre-defined templates, but sometimes a new application needs a slightly different workflow. Service Builder, included with Automation Director, contains tools needed to modify an existing template and then create a new catalog entry.
  - The Service Builder tool, included in Automation Director, contains everything needed to create workflow templates from scratch. Use Service Builder to create a totally custom workflow template connecting resources in your environment for a simple, repeatable, high quality provisioning experience.
- Manage and automate more infrastructure. In addition to automating storage provisioning, Automation Director Node licensing enables automation of associated infrastructure management tasks such as fabric and virtual machine operations
  - Direct Node LTU provides access to individual hosts and user defined web services connections.
  - Proxy Node LTU provides access to hosts and FC switches through proxy servers.

**Support**

See Service and Support section

**Prerequisites**

HPE XP8 Intelligent Management Suite

**Licensing**

- License-to-use is based on the total usable (internal+external) capacity of the HPE XP8 being managed.
- See Capacity-Licensed HPE XP8 Software section.

## Standard Features

**HPE XP8 Remote Replication Suite**
HPE XP8 Remote Replication Suite offering provides everything need to meet the most demanding availability requirements. Remote Replication Suites combines HA, CA, CAJ, 3DC CA / CAJ, 3DC CAJ / CAJ, 3DC HA / CAJ and BCM into one convenient package.

High Availability (HA) Software is an Active-Active High Availability Solution offering on HPE XP8 Storage. HPE XP8 High Availability reduces application downtime in the event of an array or array component failure and allows for transparent virtual machine mobility across sites. The high availability feature is implemented based on the HPE XP8 Multi Array Virtualization capability. HPE XP8 High Availability Software supports two use cases: Active-Active HA and Active-Active Access.

Active-Active HA provides storage uptime from a DR configuration even when an array and/or entire datacenter goes offline. Active-Active Access provides non-disruptive, transparent VM and/or clustered application mobility between hosts or servers at the same or different sites.

The HA Virtual Storage Machine features Multi Array Virtualization (MAV) which provides the virtualization architecture software to setup local or clustered mirrored volumes that look the same to any supported Host multi-path/cluster software. MAV replicates the data across HPE XP8 arrays up to a synchronous distance and provides delta re-sync capability in case of failure/maintenance.

HA can be combined with any of the other traditional mirroring program product like BC, Fast Snap to make additional copies. HA may or may not require a quorum. Today, the quorum, if any, may reside on external storage or local storage and the quorum can be virtual as well (no quorum).

Host then can use generic multi-path solutions for Active-Active access, load balancing as the Virtual Storage Machine hides and handles HA complexity.

With the HPE XP8 3DC HA solution, HPE XP8 Storage arrays on two sites replicate data synchronously while configured for Active-Active High Availability, while the HPE XP8 Storage on a third site many miles away protects against a regional disaster that hits the first two. Lose any of the sites and the other two keep going. When the “down” sites come back up the data is re-synched again to the full 3DC HA solution.

The solution combines the high availability and synchronous replication at metropolitan distances with the long distance capability of journal replication. This solution protects against local and wide area disasters. A wide area disaster could disable both data centers 1 and 2. Operations can be shifted to data center 3 A campus/metropolitan HA implementation allows for data currency due to Active-Active configuration at data center 1 and 2 with no impact to application availability or performance.

**The High Availability with Synchronous replication at Site 1 & 2**

- The HA pair volume are configured for Active-Active setup to provide for 14 9s availability
- If a failure at Site A, prevents host access to primary volume at Site A, read and write I/O can still continue to Site B , providing continuous server I/O to the data volume
- In a server-cluster configuration, HA pair need not be suspended/resynchronized during server failover/failback

Server load balancing without storage impact

## Standard Features

**The CA Journal delta resync at Site 3**

- Involves creating a Continuous Access Journal copy pair called delta-resync pair between HA S-VOL on the local site and CA Journal S-VOL on the remote site
- The journal for delta resync pair holds the differential data between the S-VOLs on local and remote sites
- Delta resync operation is performed during primary site disaster

Differential data stored in delta resync pair journal is used to synchronize the S-VOL

HPE XP8 for Business Continuity Manager provides centralized and automated management and monitoring of Business Copy for Mainframe, Continuous Access Synchronous for Mainframe and Continuous Access Journal for Mainframe.

HPE XP8 Business Continuity Manager includes Business Continuity Manager Extended CT Group functionality for synchronous replication, allowing you to maintain data consistency within and across multiple HPE XP8 Storage for Continuous Access Synchronous for Mainframe operations.

HPE XP8 Business Continuity Manager Continuous Access Journal 4x4 Ext CTG Software allows the user to maintain data consistency within and across multiple (up to four) HPE XP8 Storage for Continuous Access Journal for Mainframe operations.

The HPE XP8 Continuous Access family of high availability data and disaster recovery tools enable real-time data mirroring between HPE XP8 Storage. They provide continuous availability for all your important data and protect you from catastrophic failures. HPE XP8 Continuous Access products deliver host-independent, array-based remote recovery for a wide range of open systems environments. HPE XP8 Continuous Access provides high-performance remote mirroring in high-workload environments. Using shared mirroring and host-connect interfaces, you will better utilize your array resources. In addition, with seamless integration into a full spectrum of remote mirroring-based solutions, HPE XP8 Continuous Access can be deployed for activities ranging from data migration to high-availability server clustering.

HPE XP8 Continuous Access Suite includes HPE XP8 Continuous Access Synchronous and HPE XP8 Continuous Access Journal. HPE XP8 Continuous Access Synchronous, the base product, provides replication using a synchronous link between HPE XP8 Storage. HPE XP8 Continuous Access Journal provides replication using an asynchronous link between HPE XP8 Storage. HPE XP8 Continuous Access can be used to copy data between HPE XP8 Storage and between XP Disk Arrays of different generations. For up to date information on HPE XP8 Continuous Access compatibility between HPE XP8/XP Disk Array generations, please contact your HPE representative.

**Product Highlights**

- Remote data mirroring between HPE XP8/XP Disk Arrays
- Enables a wide range of remote mirroring solutions
- HPE XP8 Continuous Access Synchronous: Synchronous copy mode
- HPE XP8 Continuous Access Journal: Asynchronous copy mode
- Fast failover/failback for seamless, reliable mirroring recovery
- Provides data consistency for Open/Mainframe VOLs in a Multi-DKC 3 Data center multi-target configuration
- Host Agent integration using HPE XP8 RAID Manager
- Supports 3DC Continuous Access Journal x Continuous Access Journal configuration
- HPE XP8 Continuous Access Sync includes licenses for Continuous Access Synchronous for Mainframe, providing synchronous remote replication for mainframe volume types
- HPE XP8 Continuous Access Journal includes licenses for Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe, and Continuous Access Journal 3DC & 4x4 for Mainframe, providing asynchronous journal-based remote replication for mainframe volume types

## Standard Features

**Product Highlights**

- Provides Active-Active High Availability
- 100% Storage uptime in the event of an array or datacenter failure
- Non-disruptive, transparent VM o clustered application mobility between hosts (Active-Active Access)
- HA CLI management through HPE XP8 Array Manager Plus Suite (or MF Basic Suite + Array Manager Conversion Suite) and HA GUI Management through Command View Advanced Edition
- Works with general multipath software. HDLM is not mandatory.
- Support for external volumes

BCM is required for z/OS host management of CA Journal for MF, 3DC and Journal 4*4 for Mainframe

**Support**

See Service & Support section

**Prerequisites**

HPE XP8 base suite that comes bundled with the array.

**Licensing**

License-to-use is based on the total usable capacity

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**HPE XP8 for Compatible Extended Remote Copy (XRC)**

Provides asynchronous remote copies using IBM's System Data Mover on the mainframe host. Compatible XRC works with the SDM functions for z/OS Global Mirror to provide compatible replication. Required for IBM GDPS/XRC implementations.

**Support**

See Service & Support section

**Licensing**

- Licensing on one HPE XP8 Storage based on total capacity of XRC P-VOLs. Also, add the total capacity of the XRC S-VOLs on the array if reverse copy will be used for recovery operations.
- See Capacity-Licensed HPE XP8 Software section

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## Standard Features

**Mainframe Environment**

**HPE XP8 Mainframe Performance Suite**

HPE XP8 Mainframe Performance Suite consist of Compatible PAV, Compatible Hyper PAV, Compatible Super PAV, and High Performance FICON software.

Compatible PAV Enables high performance concurrent access of mainframe volumes by permitting a mainframe host system to issue multiple I/O requests in parallel to individual logical devices within the HPE XP8 Storage. Compatible PAV also enables the use of the multiple allegiance feature in z/OS when using multiple physical mainframes to access the same volumes in a single array. Compatible PAV provides static or dynamic PAV functionality

Compatible Hyper PAV greatly reduces the number of PAV aliases needed per logical subsystem while maintaining response times. PAV aliases are only bound to PAV bases for the duration of a single I/O operation, thus reducing the number of aliases needed. Compatible SuperPAV is an extension of the compatible Hyper PAV architecture and implements multiple logical control units (LCUs) within an alias management group (AMG). With compatible Super PAV, when a new I/O request occurs and there are no alias PAV devices available in the alias pool for the base PAV device's LCU, z/OS® attempts to use an alias PAV device from another LCU within the AMG subgroup.

High Performance FICON for system z or zHPF is an enhancement of the FICON channel architecture; which also means compatibility with certain standards such as Fibre Channel Physical and Signaling standard (FC-FS), Fibre Channel Switch Fabric and Switch Control Requirements (FC-SW), and Fibre Channel Single-Byte-4 (FC-SB-4) standards. Enhancements have been made to the z/Architecture® and the FICON interface architecture to deliver improvements for online transaction processing (OLTP) workloads. zHPF is implemented exclusively in System z10. When High Performance FICON is exploited by the FICON channel, the z/OS operating system, and the control unit; the FICON channel overhead will be reduced. This is achieved by simplification of the protocol, and by reducing the number of information units processed, resulting in more efficient use of the fibre link

**Support**

See Service & Support section

**Licensing**

Mainframe Performance Suite is licensed by usable capacity

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**HPE XP8 Data Protection Manager**

HPE Data Protection Manager is the answer for implementing contemporary data protection and copy management to improve data availability, compliance, governance, agility, and costs. HPE Data Protection Manager enables administrators to create policies and workflows to automate replication and copy data management, removing vast amounts of complexity and the need to create and manage custom scripts. Copy data configurations that sometimes took weeks to deploy can now be done in minutes. Its whiteboard-like GUI make it easy to create and manage replication and copy services to meet quality of service requirements. Data Protection Manager tightly integrates copy services with applications to ensure application and crash consistent backup.
HPE Data Protection Manager is structured into three products; Storage Replication, Storage File System Protection, and Storage Application Protection. Storage Replication is bundled into the Intelligent Management Suite included with the purchase of the array. File System Protection and Application Protection offered as optional.

## Standard Features

**Product Highlights**

- Create end-to-end copy-data automation and orchestration services
  - Create policy based workflows for Recovery services which include snapshots, local and remote replication, active-active and active-passive configurations, and backup parameters
  - Provide ancillary copy services to support analytics, DevOps, troubleshooting, financials, and other business functions without impacting host IO performance. This would be controlled by policy and workflow to ensure accuracy, access, and life-cycle
  - Governance copy services that keeps track of all copies. Copies are indexed to enable search, audit and analytics. Set retention policies to guard against sprawl.

- HPE Data Protection Manager's drag-n-drop GUI minimizes Copy Data Management complexity
  - Data Protection Manager uses a whiteboard-like GUI for easy creation of policies based workflows. Those workflows can then be applied using simple drag-n-drop on that same whiteboard.
  - Scale to any number of policy-based workflows to meet variations in business QoS requirements across the enterprise. Once created, quickly deploy, update, or replace workflows as needed. The result is an agile and predictable copy data environment.
  - Data Protection Manager eliminates error-prone manual repetitive tasks and the need to create and maintain scripts
    o
- Maximize recoverability and availability
  - HPE Data Protection Manager ensures application consistency on recovery by tightly coordinating application and storage copy services. Operations across local and remote copy services are also coordinated for complete end-to-end data protection.
  - Use tight integration between storage and application

- Multi-tenancy and reduced risk and costs with robust Copy Data Governance Control
  - Restrict access with granular role-based access control. HPE Data Protection Manager allows for up to 50 different parameters to govern access and supports many thousands of individual user profiles. Control what users can view and change, if and when data is updated, and when data is expired.

Governance reduces costs by controlling the lifecycle of copy data. HPE Data Protection Manager knows where data resides, and when it should be deleted. No more terabytes of stale data using up valuable storage.

**Support**

See Service and Support section

**Prerequisites**

HPE XP8 base suite that comes bundled with the array.

**Licensing**

License-to-use is based on the total usable source data capacity, which is the source capacity of the application or files that you are protecting.

## Standard Features

**HPE XP8 Online Migration Suite**
HPE XP8 Online Migration Suite enables customers to perform the migration of open system volumes themselves through an intuitive user interface. The Online Migration product is used for the data migration when storage systems are replaced (In this case from P9500/XP24000/XP20000 to HPE XP8).

Always ON Disaster Recovery: By using Online Migration, you can migrate the data including the data services like Business Copy configuration data, continuing business online non-disruptively. Even if a new storage system is introduced in the future, and the storage system is replaced with the new one, the server is able to use the new storage system as the same virtual storage machine continuously.

The product has perpetual as well as fixed term license providing flexibility to customers for better planning and scheduling their migration needs

**NOTE:** HPE XP8 Storage also has a services led online data migration offering performed by the trained professionals from HPE Services.

**Product Highlights**

- Truly online – no application outage or rebooting of hosts required
- Non-disruptive to users /application
- Supports a wide variety of applications and host operating systems
- Transparent to host operation
- Always ON Disaster Recovery
- Always On Disaster Recovery – before, during and after array migrations
- Increased disaster tolerance, Reduced risk of data loss
- Avoids a “no active DR solution” window
- Minimizes customer admin impacts through intuitive GUI
- Flexible licensing options – both perpetual and fixed term options available

**Support**
See Services/Support section

**Prerequisites**
No prerequisite

**Licensing**
The License-To-Use is based on the sum of the total usable capacity of the HPE XP8 Storage.

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**HPE XP8 DKA Encryption Software**
HPE XP8 DKA Encryption software enables the encryption capability for all the data that stored on the internal drives of the HPE XP8 Storage. The Enhanced DKA encrypts the data on drives so that data cannot be read off a drive that is removed from the HPE XP8. Only data on the drives is encrypted (data in cache is not encrypted). HPE XP8 provides enhanced security and compliance requirements with FIPS 140-2 Level 2 encryption. Enabled through license key on Level 2 compliant eDKAs, the encryption protects customer records against large scale attacks and data breaches and meets industry compliance and regulatory requirements.

**Support**
See Service & Support section

**Licensing**
License-to-use for unlimited storage capacity on one HPE XP8 Storage

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## Standard Features

**HPE XP8 External Storage**
HPE XP8 External Storage allows you to present data stored on select external storage devices as HPE XP8 Storage LUNs . HPE XP8 External Storage allows you to tier storage capabilities and provision a HPE XP8 solution to optimize return on IT investment - letting you focus high-performance/high availability native HPE XP8 Storage capacity against your most mission-critical data while hosting less critical data on cost optimized external storage subsystems.

HPE XP8 External Storage provides significant consolidation scalability - up to 255 Petabytes (PB) of external storage can be configured behind a single HPE XP8 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your HPE XP8 solution to simplify configuration complexity and reduce ongoing management cost. HPE XP8 External Storage is compatible with a wide range of HPE XP8 software tools, including HPE XP8 Business Copy for local replication, HPE XP8 Continuous Access for remote replication, and HPE XP8 Auto LUN for performance optimization.

**Note** that the HPE XP8 External Storage base LTU is included in the base software suite which is included with the purchase of the XP8 array. This product is an LTU to cover the capacity of external storage.

**Licensing**
The License-To-Use is based on the sum of the total usable external capacity.

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**HPE XP8 Performance Advisor Software**
HPE XP8 Performance Advisor Software is a web-based application for collecting, monitoring, and displaying the performance of your HPE XP8 Storage. With HPE XP8 Performance Advisor, you choose the time and duration of performance data collection-so you can pinpoint activities that significantly affect your HPE XP8 and tune the array accordingly. You can easily monitor storage performance and display usage statistics for your storage system at any level, from a complete system overview down to individual components. You can also filter hosts, arrays, and array components, so you are only seeing the hosts and arrays you want to see. You can also generate, schedule and view detailed performance reports that will allow you to identify any performance bottlenecks in your HPE XP8 Storage.

Performance Advisor now supports VMVision which enables you to analyze your VMware virtual environment, detect potential issues, and take corrective action before problems occur. Performance Advisor integrates with HPE XP8 Tiered Storage Manager, providing Array Group performance data. This allows Tiered Storage Manager to monitor access patterns so that you can consider performance implications before migrating data.
Not supported in mainframe environment.

**Support**
See Service & Support section

**Licensing**
For HPE XP8 Storage, License-to-use is based on total usable (internal + external) capacity. See Capacity-Licensed HPE XP8 Software section for more details.

## Standard Features

**Product Highlights**

- Real time data gathering and analysis
- VMVision
- System view of all array resources
- Dashboard for quick review of HPE XP8 performance status
- Macro view of applications to quickly isolate and troubleshoot performance problems
- Graphical presentation of array component metrics in form of charts
- Enhanced troubleshooting
- Metrics for other products running on XP array like Thin Provisioning , Smart Tiers, CA
- Detailed performance report generation and scheduling
- Flexible event notification and large 320 GB historical repository
- Multi-OS support
- Multiple management stations support
- Coexistence of Windows-based host agent and Windows-based management station on the same server (not recommended for large configurations)
- HPE XP8 Storage External Storage performance monitoring
- Integrates with HPE XP8 Tiered Storage Manager (Requires Performance Advisor and HPE XP8 Command View AE. Performance Advisor and Command View AE provide the best combination of features and performance.)
- VMware VVOL support – To identify ALU/SLU
- Enhanced monitoring and reporting for replication volumes
- Identify performance bottlenecks by monitoring metrics at MPB level

**Prerequisites**

- Management Station for standalone deployment (provided separately by customer)
  - Management Server on its own management station
    - Supports single core, dual-core, and quad-core processors
  - 3-GHz CPU, 4-GHz CPU (recommended for large configurations > 2GB database)
  - 2 GB RAM (minimum), 4 GB RAM (recommended for large configurations > 2GB database)
  - 10 GB free drive space (minimum), 320GB free drive space (for maximum history detail)
  - NTFS
  - DVD drive
  - VGA monitor with 256 colors or better
  - At least one LAN Card
- Host Agent: refer to the HPE XP8 Performance Advisor Installation Guide
- Minimum Array Firmware - refer to the release notes associated with the particular version of Performance Advisor

## Standard Features

**HPE XP8 for Data Exchange**
HPE XP8 Data Exchange Software allows seamless data exchange between mainframe and open systems hosts. It provides management of data format and code conversions, and allows information sharing across computing platforms.

**Product Highlights**

- Mainframe and open systems data managed and stored on single HPE XP8 Storage
- Automatic data format and code conversions
- Supports HPE UX, Windows, Linux, Sun Solaris, and AIX Operating Systems

**Support**
See Service & Support section

**Licensing**
License-to-use on a per server basis (per server connected to one HPE XP8 Storage). One License required for each server running HPE XP8 for Data Exchange Software.

**HPE XP HDLM Advanced Upgrade**
Sole use of this product is to upgrade existing customers using HDLM to HDLM Advanced Suite.

**Support**

- See Service & Support section

**Licensing**

- 1 HDLM Advanced Upgrade LTU required for each HDLM server connected the HPE XP.

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**HPE XP8 Plug-ins**
HPE XP8 Storage supports all the major plug-ins for VMware and Microsoft which are critical for the High End storage requirements. For the OpenStack community, HPE XP8 Storage has its own cinder driver for integrating with cloud. Below are some major plug-ins for HPE XP8.

**HPE XP8 Storage Replication Adapter Software for VMware vCenter SRM**
HPE XP8 Storage Replication Adapter (SRA) Software for VMware vCenter SRM. The SRA, developed for HPE XP8, XP7, XP P9500, XP 24000/XP20000, and XP 12000/10000 disk arrays, enables Site Recovery Manager (SRM) to work with Continuous Access array-based replication. The VMware Site Recovery Manager (SRM) protects the virtual machine systems on VMware from disasters and other emergencies. It streamlines the protection of critical virtual machines with data, and continuously tests their availability for the highest level of business continuity. During SRM configuration, SRA is used to discover local and remote HPE XP8 disk arrays. SRA is also used to discover HPE XP8 DR Groups and ensure DR Group is in synchronized state prior to failing VM from local to remote site.

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**HPE XP8 Storage Adapter for Microsoft Volume Shadow copy Service**
Allows backup and restore operations via coordination between backup applications, line-of-business applications that are being backed up, and the storage management hardware and software. This ultimately enables customers to back up application data without taking the application offline. HP's provided service offloads the task of creating and maintaining shadow copies from the host operating system.

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## Standard Features

**HPE XP8 Storage Plug-In for VMware vCenter**
This is a plug-in that provides integrated management of XP storage subsystems within vCenter 6.x The plug-in allows the vCenter 6.x administrator to automatically configure ESX hosts to XP storage subsystems.
XP Storage Adapter for VMware vRealize Log Insight
Log collection and analytics virtual appliance that enables administrators to collect, view, manage and analyze syslog data. Log Insight provides real-time monitoring of application logs, network traces, configuration files, messages and performance data.
XP Storage Adapter for VMware vRealize Orchestrator

**Development and process-automation platform** that provides an extensive library of workflows and a workflow engine. The Orchestrator plug-in architecture allows you to access and control external technologies and applications
View Function

- The View function is used to display the storage system information registered in the HPE XP8 Storage Plug-in, the datastore on ESXi using the storage system, and virtual machine information

**Provision Datastore Function**

- The Provision Datastore function allows for one-step creation of a datastore on an ESXi Host

LDEV on HPE XP8 Storage is assigned to the specific Host Group or iSCSI target and the datastore using the detected LDEV is created.

**Delete Datastore Function**

- It's a one-step operation that removes a datastore and underlying LDEV from the HPE XP8 Storage registered to the HPE XP8 Storage plug-in

**HPE XP8 Performance Advisor Adapter for VMware vRops**
HPE XP8 Performance Advisor Adapter for VMware vRops 1.0 provides integrated performance and configuration details to the vCenter Operations Manager custom Graphical User Interface (GUI). The software uses the vRopss analytics engine to monitor and analyze the performance of the HPE XP8 Storage Array environments.

HPE XP8 Storage Provider for VMware vCenter (VASA Provider)
VVol provides efficient granular storage management at VM level:

- 1:1 mapping of Virtual Disk to Storage Volume(VVol)
- Allows native storage services and policies applied at per VM level
- Heavy VM operations like Clone, Snapshots, Migration offloaded from ESXi Server to Storage system

HPE XP8 VASA provider will match the requests from vSphere (via storage policy profiles) with HPE XP8 Storage (via capability profiles).

**HPE XP8 Storage Cinder Volume Driver**
To support the need that large organizations and service providers have for Enterprise class storage on cloud:

- HPE XP8 launches Cinder driver which supports OpenStack technology and is based on Block Storage(Cinder) plug-in architecture
- Provides flexibility and cost-effectiveness of a cloud based open source platform to customers with mission critical requirements

Supports FC protocol. The HPE XP8 Cinder driver will be qualified with OpenStack Liberty release.

**XP Storage Adapter for Microsoft Powershell**
Task-based command-line shell and scripting language designed especially for system administration. control and automate the administration of the Windows operating system and applications that run on Windows

## Standard Features

**Support**
See Service & Support section

**Licensing**
The plug-ins are available for free download from the software depot.

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**HPE Serviceguard Metrocluster with HPE XP8 and XP Continuous Access and HPE Serviceguard for Linux x86 Enterprise edition**
HPE Serviceguard Metrocluster with HPE XP8 and XP Continuous Access seamlessly integrates HPE XP8 Storage remote replication capabilities with HPE Serviceguard for HPE-UX and Linux. It provides automatic and bi-directional failover/failback of business critical data and applications between data centers. HPE Metrocluster with HPE XP8 and XP Continuous Access supports HPE XP8 Storage in a two Data Center configuration.

For HPE Serviceguard for Linux, Enterprise edition brings in disaster recovery capability and is for customers who want to protect their applications against site outages up to any distance where latency between the sites is lower than 100ms. This edition provides automatic, bi-directional failover and failback across data centers up to several hundred miles apart. Enterprise edition supports storage array-based replication technologies with HPE P9000/EVA Continuous Access, P6000/XP Continuous Access, HPE 3PAR Remote Copy and EMC SRDF for Symmetrix arrays.

When combined with the HPE Continental clusters product, HPE Serviceguard Metrocluster with HPE XP8 and XP Continuous Access or HPE Serviceguard for Linux x86 Enterprise edition can also be used to replicate data and to perform application recovery across three data centers using the following storage devices: HPE XP8, XP P9500, XP24000, XP20000, XP12000, and XP10000.

**NOTE:** HPE Metrocluster is a component of HPE Serviceguard for Linux x86 Enterprise edition since February 2014.

**Product Highlights**

- Extends protection provided by a Serviceguard cluster to cover disasters that affect the whole data center.
- Functions as an automatic failover/failback disaster recovery solution for HPE Serviceguard for HPE-UX and Linux.
- When combined with the HPE Continental clusters product, provides the ability to replicate data across three data centers (with HPE XP8, P9500, XP24000, XP20000, XP12000 and XP10000 Disk Arrays) resulting in minimal Recovery Point Objective (RPO) / Recovery Time Objective (RTO). This configuration provides protection against widespread disasters that may affect an entire region.

**Support**
Please contact your HPE representative for details

**Prerequisites Software**

- HPE-UX 11i v1 or higher. The 3 Data Center capability is available only on HPE-UX 11i v2 or higher.
- RHEL 5 or 6, SUSE 11 (SP2 or higher)
- HPE Serviceguard
- HPE XP8 Continuous Access (HPE XP8 Continuous Access Sync, or HPE XP8 Continuous Access Journal)
- HPE XP8 RAID Manage

**Licensing**

- One license needed for every clustered environment

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## Standard Features

**HPE Serviceguard Continentalclusters**
HPE Serviceguard Continentalclusters software provides the highest levels of disaster tolerance by eliminating the cluster itself as a single point of failure. It uses data replication technologies to provide application recovery across multiple widely separated HPE-UX or Linux Serviceguard clusters.

Continentalclusters provides the ability to monitor a Serviceguard cluster and recover mission-critical applications to a remote Serviceguard cluster, should the monitored cluster become unavailable or if there is a disaster at the cluster site. Continentalclusters allows for a semi-automatic push button type of recovery. When a cluster failure or a site disaster is detected, Continentalclusters generates a notification. An operator, upon receipt of a notification, can start the recovery of applications at a recovery cluster using a single Continentalclusters command that automates the recovery procedure. Continentalclusters supports mutual recovery across two clusters. In a mutual recovery pair, each cluster is configured to recover the mission-critical applications running in the other cluster.

Applications can be configured in Continentalclusters for disaster tolerance using HPE XP8 Storage and HPE XP8 Continuous Access data replication technology.

**Product Highlights**

- Continentalclusters supports recovery of single instance applications like Oracle over LVM, VxVM and CVM/CFS 5.0.1 and 5.1 SP1
- Continentalclusters supports recovery of multi-instance applications like Oracle RAC over SLVM and CVM/CFS 5.0.1 and 5.1 SP1.
- HPE Serviceguard for Linux Continentalclusters does not support Oracle RAC over SLVM or CVM/CFS

**Support**
Please contact your HPE representative for details

**Prerequisites**
**Software**

- HPE-UX 11i v1 or higher, RHEL 5 or 6, SUSE 11 (SP2 onwards) (For more information, please refer to: **http://docs.hpe.com**)
- HPE Serviceguard (11.20)
- HPE Metrocluster with HPE XP8 Continuous Access

**Licensing**

- One license of Serviceguard Continentalclusters covers two pairs of clusters (Primary and Recovery). Use Option 888 (designed for use with HPE Metrocluster with HPE XP8 Continuous Access).
- Each license of Serviceguard Continentalclusters requires one license of HPE Metrocluster with HPE XP8 Continuous Access.
- When purchasing HPE Serviceguard for Linux, appropriate number of Licenses to Use (LTU) must be ordered and a copy of the Software must be ordered separately. The Software copy can be ordered by e-Delivery or by Physical Media (DVD).
- One License to Use (LTU) must be ordered for each active socket running HPE Serviceguard for Linux software. This new Per Socket License (PSL) is offered, replacing System-wide licenses and Per Core Licenses (PCL).

## Standard Features

**HPE XP Cluster Extension Software**
HPE XP Cluster Extension Software offers protection against system downtime to critical applications for enterprise customers using the HPE XP Storage family. It allows for hands-free failover/failback of server-storage system. It detects failures and automatically manages recovery without human intervention, offering comprehensive disaster tolerance against application downtime from fault, failure, or site disaster. HPE XP Cluster Extension Software resurrects your critical applications at a remote site within seconds/minutes after a failover event over both metropolitan and global distances. XP Cluster Extension works seamlessly with your open-system clustering software, HPE XP Continuous Access Software and your XP Storage system to provide a highly available IT system.

**Product Highlights**

- Automatic failover/failback recovery solution for native clusters on Red Hat and SUSE Linux, Microsoft Cluster Service (MSCS) for Windows
- Seamless integration of remote mirroring with server clusters
- Fully scripted turnkey solution for disaster recovery on Linux and Widows

**Support**
See Service & Support section

**Prerequisites**
**Software**

- HPE XP8 Continuous Access Synchronous (required for synchronous copy mode-integrated solution)
- HPE XP8 Continuous Access Journal (required for asynchronous copy mode-integrated solution)
- HPE XP8 RAID Manager (required for host agent integration)

**Licensing**

- License-to-use either on a per server node basis or an array basis.
- Node based: One License required for each server running XP Cluster Extension Software.
- Array based: One License required for every array connected to the server running XP Cluster Extension Software.

## Standard Features

**HPE XP8 Virtualization Adapter**
HPE XP8 Virtualization Adapter (HPE XP8 Virtualization Adapter) provides an interface between VMware Site Recovery Manager (SRM) and HPE XP8 Storage. The interface enables SRM to provide automatic access to remote data copies when virtual machines become unavailable locally.

HPE XP8 Virtualization Adapter supports HPE XP8, XP7, XP P9500, XP24000/XP20000, XP12000/XP10000 Disk Arrays.

**Product Highlights**
HPE XP8 Virtualization Adapter performs the following functions for SRM:
Discovers disk arrays
Discovers replicated LUNs
Fails over storage for testing (test a recovery plan)
Fails over storage for recovery (execute a recovery plan)

**Prerequisites**
Servers with VMware Site Recovery Manager
HPE XP8 Continuous Access Synch and/or HPE XP8 Continuous Access Journal installed on both the local and remote HPE XP8 Storage
RAID Manager 1.24.13 or later (to support HPE XP8 Storage)
Optional: HPE XP8 Business Copy installed on both the local and the remote HPE XP8 Storage

**Licensing**
The HPE XP8 Virtualization Adapter is provided as a free download.

**Capacity-licensed HPE XP8 Software**

Many HPE XP8 software titles are licensed based on some measure of the storage capacity of the system. This structure allows customer costs for software to scale with the cost for their hardware solution. In all cases, a 1TB increment is the smallest increment available. Therefore, for all capacity requirement calculations, capacity figures should be rounded up to the next highest TB. T

## Service and Support

**Warranty**
Warranty level of hardware reactive support is 3 years, 24×7, with 4-hour onsite response.
Warranty level increased to 5 years on new 7TB (H6G72D) and 14TB (H6G73D) Flash Module Devices.

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**Achieve maximum return from your IT investment**

Get the expertise you need at every step of your IT journey with **HPE Pointnext services and support.** We help you lower your risks and costs using proven best practices, automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally. With **Advisory Services,** we focus on your business outcomes and goals, partnering with you to design your transformation and build a roadmap tuned to your unique challenges. Our **Professional** and **Operational Services** can be leveraged to speed up time-to-production, boost performance and accelerate your business. HPE Pointnext specializes in flawless and on-time implementation, on-budget execution, and creative configurations that get the most out of software and hardware alike.

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**Consume IT on your terms**

**HPE GreenLake Flex Capacity** combines the simplicity, agility, and economics of public cloud with the security and performance benefits of on-premises IT. You determine your own "Right Mix" of Hybrid IT and workload placement without having to use.

With its agile pay-per-use service, HPE GreenLake Flex Capacity can help your IT organization:

- Avoid IT expenses stemming from overprovisioning
- Improve time to market by maintaining a safe buffer of capacity, ready for use when you need it
- Keep capacity ahead of demand with regular monitoring—and a simple change order to replenish
- Pay for only the capacity used, not the capacity deployed
- Reduce IT risk with tailored support

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**Connect your devices**
Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Reduce down time, increase diagnostic accuracy and have 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. Learn more about getting connected at **www.hpe.com/services/getconnected**

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**Free up resources with Operational Services from HPE Pointnext**
Choose from the recommended services for customers purchasing from Hewlett Packard Enterprise or an authorized reseller are quoted using Hewlett Packard Enterprise order configuration tools.

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**HPE Datacenter Care** helps customers to address the pressing needs of IT today and smoothly transform to a more agile cloud-like IT operations model. We help run and monitor your IT by offloading the day to day routine tasks, helping customers be more predictive and proactive, and saving time with one place to call with for all of their IT. Datacenter Care is available as both tailored statement of work and as a packaged service for 3, 4, and 5 year terms.

Partner with an assigned account team backed by local and global experts, access HPE enhanced call experience with priority access, use specialized support for complex, technologies, choose hardware and software support for your devices, implement proactive monitoring to stay ahead of issues , and access HPE IT best practices and IP. HPE Datacenter Care advantage options are available to add to your agreement to give you specialized expertise for performance, security, back up analysis, and much more.
**https://www.hpe.com/us/en/services/datacenter-hybrid-services.html**

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## Service and Support

**HPE Proactive Care Advanced** incorporates all the deliverables of HPE Proactive Care plus includes personalized support from a local, assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to help increase stability and reduce unplanned downtime.

Leverage your system's ability to connect to HPE for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, Proactive Care Advanced offers critical event management to help reduce mean time to resolution. HPE Service Credits are included to redeem for technical and operational services. HPE Proactive Care Advanced is offered in 3, 4, and 5 year terms with a choice of response levels: 24x7 with a 4 hour response and 24x7 with 6 hour call to repair (CTR).
**https://www.hpe.com/h20195/v2/getdocument.aspx?docname=4AA5-3259ENW**

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**Other related services from HPE Pointnext**

**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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**Defective Media Retention** is an option available with HPE Datacenter Care, HPE Proactive Care, Proactive Care Advanced, and HPE Foundation Care and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

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**HPE Service Credits** offers flexible services and technical skills to meet your IT demands as your business evolves. With a menu of services, you can access additional resources and specialist skills to help you maintain peak performance of your IT. HPE Service Credits help you proactively respond to your dynamic IT and business needs.

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**HPE Education Services** provides comprehensive training designed to expand the skills of your IT staff and keep them up to speed with the latest technologies.

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**HPE XP Storage Installation and Startup Service** - Installs, configures, and tests your HPE XP8 hardware and software onsite. We deliver deployment of your HPE XP8 storage properly integrated into your environment.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-4064ENW.pdf**

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**HPE Storage Transformation** Workshop explore data management to business-aligned visions, covering cloud, object, end to end data protection and BC/DR.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-9541ENW.pdf**

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**HPE Storage Data Migration** proven methodology, expertise and tools to help you migrate data across your data center or around the globe.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA5-3759ENW.pdf**

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## Service and Support

**HPE Storage Modernization Service** modernize your storage environment to take better advantage of physical or virtualized server environments, all flash, cloud, and object storage solutions.
**http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA5-8498ENW.pdf**

**HPE Backup and Recovery Efficiency Analysis Service** rapid health check of your current backup environment, focusing on operational stability, problem identification, and capacity constraints. The output of this service provides clear metrics and high-level recommendations for your backup environment.
**https://h20195.www2.hpe.com/V2/getpdf.aspx/4AA3-9104ENW.pdf**

**HPE SAN Deployment Service** delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-8527EN.pdf**

**HPE Storage Virtual Volume Design and Implementation Service** - Activities your organization needs to design and implement a new LUN, virtual volume, or virtual disk (Vdisk) configuration.

**HPE Data Replication Solution Service for Business** Copy enables snapshots and mirroring to facilitate data restores, minimize downtime for backups, perform application testing and support data mining use with decision-support tools.
**https://h20195.www2.hpe.com/v2/GetPDF.aspx/5982-4153ENN.pdf**

**HPE Data Replication Solution Service for Continuous Access**/High Availability configures real-time data mirroring between local and remote storage systems to safeguard critical business information.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-4154EN.pdf**

**HPE Performance Analysis Service for HPE Storage** provides data collection, detailed I/O analysis and enhancement recommendations for HPE Storage arrays.
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-6668EN.pdf**

**HPE Storage Virtual Volume Design and Implementation Service** - provides the necessary activities required to design and implement a new LUN, virtual volume, or virtual disk (Vdisk) configuration**.**
**http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-3764ENN.pdf**

**HPE Data Sanitization Storage and Server** Services provides the skilled resources and tools to help your organization address the need to protect data when your organization is retiring systems, upgrading storage and servers, returning leased equipment, or redeploying data storing devices. Using specialized software techniques, an HPE service specialist or authorized service partner will help ensure that data cannot be reconstructed or retrieved from hard disk media in your server and storage devices. These services offer you a smart alternative or augmentation to physical hardware destruction by executing procedures to remove data from disk media.
**https://www.hpe.com/h20195/v2/GetPDF.aspx/5981-9510EN.pdf**

**Accessories**
An extensive list of accessories is available for this product; for more information, please contact your HPE sales representative.

**Safety**
This product meets all applicable safety and regulatory specifications.

For more information consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and support options.

## Configuration Information

Each HPE XP8 can be a custom configuration. For more information, please contact your reseller or authorized Hewlett Packard Enterprise representative to work with the requirements to configure the product correctly.

| SKU Description | SKU |
|---|---|
| **SSP** | |
| HPE XP8 Hybrid Storage Array | R0L99A |
| HPE XP8 All Flash Storage Remanufactured Array | R0K99A |
| **NOTE:** The XP8 is a Structured Solution Product (SSP). These product number (R0L99A and R0K99A) is a zero-price ordering mechanism that is used as an “umbrella” product to indicate to the ordering system that this is a new HPE XP8 order. | |
| **Rack** | |
| HPE XP8 Storage Rack | R0K76A |
| **NOTE:** Each HPE XP8 rack is suitable for DKC and DKU racks. The rack SKU includes a key kit. | |
| **DKCs – Disk Controller Chassis** | |
| HPE XP8 Dual Base Disk Controller Chassis | R0K82A |
| **NOTE:** Includes: 2 Disk Controller Chassis each with 1 controller, Interconnect & Management Network Switch Chassis, XP8 Software Suite, 1 SVP, Bezels and Rail Kits. | |
| HPE XP8 Dual Performance Disk Controller Chassis | R0K80A |
| **NOTE:** Includes: 2 Disk Controller Chassis each with 2 controllers, Interconnect & Management Network Switch Chassis, XP8 Software Suite RTU, 1 SVP, Bezels and Rail Kits. | |
| HPE XP8 Dual Secondary Performance Disk Controller Chassis | R0K81A |
| **NOTE:** Includes: 2 Disk Controller Chassis, each DKC with 2 controllers, XP8 Software Suite RTU, 1 SVP, Bezels and Rail Kits.<br>HPE XP8 Upgrade Controller Module (R0K85A)<br>**NOTE:** Includes: 2 controller upgrade set, XP8 Software Suite RTU.<br>HPE XP8 Controller Module Upgrade PCIe Cable Kit (R0M00A)<br>HPE XP8 Controller Module Fan Kit (R0M10A). | |
| **Media Chassis SBX** | |
| HPE XP8 Small Form Factor Drive Chassis | R0K90A |
| **NOTE:** 96 slot SFF Drive Chassis with Bezels and Rail Kit. | |
| **Media Chassis NBX** | |
| HPE XP8 NVMe Drive Chassis | R0K92A |
| **NOTE:** 96 slot SFF Drive Chassis with Bezels and Rail Kit. | |
| **Media Chassis UBX** | |
| HPE XP8 Large Form Factor Drive Chassis | R0K91A |
| **NOTE:** 96 slot LFF Drive Chassis with Bezels and Rail Kit. | |
| **Media Chassis FBX** | |
| **HPE XP8 Flash Module Device Chassis** | R0K93A |
| **NOTE:** 48 slot Flash Module Chassis with Bezels and Rail Kit. | |

## Configuration Information

| SKU Description | SKU |
|---|---|
| **Power Distribution Unit (PDU)** | |
| HPE XP8 3-phase 60Hz 2-pack PDU | R0L75A |
| **NOTE:** Includes C19 to C13 adapter cables | |
| HPE XP8 3-phase 50Hz 2-pack PDU | R0L76A |
| HPE XP8 1-phase 60Hz 2-pack PDU | R0L77A |
| HPE XP8 1-phase 50Hz 2-pack PDU | R0L78A |
| **Power Cords** | |
| HPE XP8 C13 to C14 240V 1.3m 4-pack WW AC Power Cord | R0M06A |
| HPE XP8 C13 to C14 240V 2m 4-pack IN AC Power Cord | R0M07A |
| **SVP** | |
| HPE XP8 Service Processor and Hub | R0K86A |
| HPE XP8 Service Processor/Hub LAN Cable Kit | R0L80A |
| **NOTE:** For redundant array management functions. | |
| HPE XP8 LAN to LAN 5m 2-pack Service Processor/Hub Cable | R0L81A |
| HPE XP8 LAN to LAN 10m 2-pack Service Processor/Hub Cable | R0L82A |
| HPE XP8 LAN to LAN 20m 2-pack Service Processor/Hub Cable | R0L83A |
| HPE XP8 LAN to LAN 30m 2-pack Service Processor/Hub Cable | R0L84A |
| **DKC connecting kits** | |
| **NOTE:** 5, 10, 20, and 30 meter cables to connect primary and secondary DKC pairs. | |
| HPE XP8 QSFP to QSFP 5m 8-pack PCIe Optical Cable | R0M01A |
| **NOTE:** Default to this kit when secondary controller is ordered. | |
| HPE XP8 QSFP to QSFP 10m 8-pack PCIe Optical Cable | R0M02A |
| **NOTE:** Can be used instead of R0M01A | |
| HPE XP8 QSFP to QSFP 20m 8-pack PCIe Optical Cable | R0M03A |
| **NOTE:** Can be used instead of R0M01A | |
| HPE XP8 QSFP to QSFP 30m 8-pack PCIe Optical Cable | R0M04A |
| **NOTE:** Can be used instead of R0M01A | |
| **DKA** | |
| HPE XP8 Backend 4-pack SAS I/O Module | R0L10A |
| HPE XP8 Backend 4-pack NVMe I/O Module | R0L12A |
| **NOTE:** Disk Adapter controls data transfer between the drives and cache memory. | |
| **eDKA** | |
| HPE XP8 Encrypted Backend 4-pack SAS I/O Module | R0L11A |
| **NOTE:** Encryption is supported with this DKA and optional encryption software LTU. | |
| **Intra-rack DKC to Media Bay Cables** | |
| HPE XP8 QSFP to QSFP Basic 8-pack SAS Metal Cable | R0L90A |
| **NOTE:** Backend SAS Copper cables – will default for the DKC to SAS Media Chassis connections. | |

## Configuration Information

| SKU Description | SKU |
|---|---|
| HPE XP8 QSFP to QSFP 1m 16-pack SAS Metal Cable | R0L91A |
| **NOTE:** 1 meter backend SAS Copper cables – will default for the intra-rack connections among SAS Media Bays | |
| HPE XP8 QSFP to QSFP 1.5m 16-pack SAS Metal Cable | R0L92A |
| Note: 1.5m backend SAS Copper cable for connecting to UBX only | |
| HPE XP8 QSFP to QSFP Basic 8-pack NVMe Metal Cable | R0L98A |
| **NOTE:** DKC to NBX – NBX always in same rack as DKC | |
| **Optical Inter-rack Device Interface Cables** | |
| HPE XP8 QSFP to QSFP 5m 16-pack SAS Optical Cable | R0L93A |
| **NOTE:** 5 meter backend SAS Optical cables – can be swapped out for longer cables if the racks are not adjacent | |
| HPE XP8 QSFP to QSFP 10m 16-pack SAS Optical Cable | R0L94A |
| **NOTE:** 10 meter backend SAS Optical cables – can be used for connecting non-adjacent racks | |
| HPE XP8 QSFP to QSFP 20m 16-pack SAS Optical Cable | R0L95A |
| **NOTE:** 20 meter backend SAS Optical cables – can be used for connecting non-adjacent racks | |
| HPE XP8 QSFP to QSFP 30m 16-pack SAS Optical Cable | R0L96A |
| **NOTE:** 30 meter backend SAS Optical cables – can be used for connecting non-adjacent racks | |
| **Cache Memory with Backup Module Module** | |
| HPE XP8 8x32GiB Cache Memory with Backup Module | R0L00A |
| **NOTE:** Consists of 8 32GiB DIMMs and Small Backup Memory Kit | |
| HPE XP8 8x64GiB Cache Memory with Backup Module | R0L01A |
| **NOTE:** Consists of 8 64GiB DIMMs and Small Backup Memory Kit. | |
| **CHB – Channel Host Boards** | |
| HPE XP8 16/32Gb 4-port Fibre Channel 2-pack Host Bus Adapter | R0L24A |
| **NOTE:** 1 Pair of 4 port 16/32Gbps Fibre Channel Host Adapters. | |
| **NOTE:** SFP Transceivers are required to be ordered with R0L24A | |
| HPE XP8 10Gb 2-port iSCSI 2-pack Host Bus Adapter | R0L30A |
| **NOTE:** 1 Pair of 2 port 10Gbps iSCSI Channel Host Adapters. | |
| HPE XP8 16Gb 4-port Mainframe Short Wave Fibre Channel 2-pack Host Bus Adapter | R0L20A |
| **NOTE:** 1 Pair of 4 port 16Gbps FICON Shortwave Fibre Host Adapters. | |
| HPE XP8 16Gb 4-port Mainframe Long Wave Fibre Channel 2-pack Host Bus Adapter | R0L21A |
| **NOTE:** 1 Pair of 4 port 16Gbps FICON Longwave Fibre Host Adapters. | |
| **Transceivers** | |
| HPE XP8 16Gb SFP Long Wave 2-pack Transceiver | R0L25A |
| **NOTE:** Pair of 16Gbps Longwave Transceivers | |
| HPE XP8 16Gb SFP Short Wave 2-pack Transceiver | R0L26A |
| **NOTE:** Pair of 16Gbps Shortwave Transceivers | |
| HPE XP8 32Gb SFP Short Wave 2-pack Transceiver | R0L27A |
| **NOTE:** Pair of 32Gbps Shortwave Transceivers | |

## Configuration Information

| SKU Description | SKU |
|---|---|
| **Flash Module FMD** | |
| HPE XP8 7TB Flash Module Device w/inline HW compression | R0L70A |
| HPE XP8 14TB Flash Module Device w/inline HW compression | R0L71A |
| **HPE Drives** | |
| **12G SAS Solid State Drives SFF (2.5”)** | |
| HPE XP8 960GB SAS 6G SFF (2.5in) SSD | R0L50A |
| HPE XP8 1.9TB SAS 6G SFF (2.5in) SSD | R0L51A |
| HPE XP8 3.8TB SAS 6G SFF (2.5in) SSD | R0L52A |
| HPE XP8 7.6TB SAS 6G SFF (2.5in) SSD | R0L53A |
| HPE XP8 15.3TB SAS 6G SFF (2.5in) SSD | R0L54A |
| HPE XP8 30TB SAS 6G SFF (2.5in) SSD | R0L55A |
| **12G SAS Hard Disk Drives LFF (3.5”)** | |
| HPE XP8 10TB SAS 6G 7.2K LFF (3.5in) HDD | R0L60A |
| HPE XP8 14TB SAS 6G 7.2K LFF (3.5in) HDD | R0L61A |
| **12G SAS Hard Disk Drives SFF (2.5”)** | |
| HPE XP8 2.4TB SAS 10K SFF HDD | R0L67A |
| **NVMe Solid State Drives SFF (2.5”)** | |
| HPE XP8 1.9TB NVMe x4 Lanes SFF (2.5in) Flash Drive | R0L40A |
| HPE XP8 3.8TB NVMe x4 Lanes SFF (2.5in) Flash Drive | R0L41A |
| HPE XP8 7.6TB NVMe x4 Lanes SFF (2.5in) Flash Drive | R0L42A |
| HPE XP8 15.3TB NVMe x4 Lanes SFF (2.5in) Flash Drive | R0L43A |

**Capacity-licensed HPE XP8 Software Product Structure**

**Capacity-licensed HPE XP8 Software licenses are ordered in 1TB increments only.**

| Description | SKU |
|---|---|
| Base License | R0WxxAA |
| 1TB increment | R0WxxAB |

Customers purchase the Base License and then purchase all capacity licenses under a fixed schedule depending on the license capacity required. All capacity figures should be rounded up to the nearest TB. Purchase of capacity-based software falls into two categories:

**New Software purchase**: Software licenses are being purchased along with a new HPE XP8 Storage or for a new software purchase for an existing HPE XP8 Storage implementation.

**License Capacity upgrade purchase**: A customer is adding usable storage capacity to their system or expanding the use of certain software titles, requiring that they expand the license capacity by purchasing additional LTU products.

## Additional Options

| SKU Description | SKU |
|---|---|
| HPE XP8 HPE XP8 Automation Director Software Base LTU LTU | R0W49AA |
| HPE XP8 Automation Director Software 1TB LTU | R0W49AB |
| HPE XP8 Automation Director Software Direct Node 25 Nodes Pack LTU | R0W49AC |
| HPE XP8 Automation Director Software Proxy Node 5 Nodes Pack LTU | R0W49AD |
| HPE XP8 Remote Replication Suite Base LTU | R0W42AA |
| HPE XP8 Remote Replication Suite 1TB LTU | R0W42AB |
| HPE XP8 Data Protection Manager Storage File System Protection Base LTU | R0W56AA |
| HPE XP8 Data Protection Manager Storage File System Protection 1TB LTU | R0W56AB |
| HPE XP8 Data Protection Manager Storage Application Protection Base LTU | R0W62AA |
| HPE XP8 Data Protection Manager Storage Application Protection 1TB LTU | R0W62AB |
| HPE XP8 Online Migration Suite Base LTU | R0W48AA |
| HPE XP8 Online Migration Suite 1TB LTU | R0W48AB |
| HPE XP8 DKA Encryption Frame LTU | R0W47A |
| HPE XP8 Performance Advisor Software Base LTU | R0W58AA |
| HPE XP8 Performance Advisor Software 1TB LTU | R0W58AB |
| **NOTE:** The HPE XP8 Performance Advisor Base License includes the media kit. | |
| HPE XP8 Data Exchange Server LTU | R0W44A |
| HPE XP8 Compatible Extended Remote Copy Base LTU | R0W45AA |
| HPE XP8 Compatible Extended Remote Copy 1TB LTU | R0W45AB |
| HPE XP8 Mainframe Performance Advanced Suite Base LTU | R0W43AA |
| HPE XP8 Mainframe Performance Advanced Suite 1TB LTU | R0W43AB |
| HPE XP HDLM Advanced Upgrade LTU | R0W55A |
| HPE MetroCluster with Continuous Access XP LTU | B8109CA |
| HPE Serviceguard for Linux x86 1yr 24x7 Enterprise PSL Flexible LTU | BB097AC |
| HPE Serviceguard for Linux x86 1yr 24x7 Enterprise PSL E-LTU | BB097ACE |
| HPE Serviceguard for Linux x86 Enterprise DVD Media | BB097AA |
| HPE Continental Clusters LTU | T2346BA |
| HPE Continentalcluster for Linux x86 1yr 24x7 PSL Flexible LTU | BB100AC |
| HPE Continentalcluster for Linux x86 1yr 24x7 PSL Flexible E-LTU | BB100ACE |
| **NOTE:** Either of the above LTUs is required. | |
| HPE Serviceguard Continentalclusters for Linux Media Kit | BB086AA |
| HPE P9000 Cluster Extension Software Windows LTU | TB534A |
| HPE XP P9000 Cluster Extension Windows Array LTU | BC886B |
| HPE XP8 External Capacity Software Suite 1TB LTU | R0W57A |

## Technical Specifications

| | |
|---|---|
| **System Capacity** | 0 GB – 69.1 PB raw<br>0 GB - ~60 PB usable |
| **RAID Levels** | RAID 1 (2D + 2D)<br>RAID 1 (4D + 4D)<br>RAID 5 (3D + 1P)<br>RAID 5 (7D + 1P)<br>RAID 6 (6D + 2P) Recommended<br>RAID 6 (14D + 2P) Recommended |
| **Maximum number of Logical Devices** (LDEVs) | 65,280 |
| **Cache Memory** | 256 GB - 6 TB |
| **Operating Systems** | HPE-UX, HPE NonStop, VMWare, AIX, Linux, Windows, Solaris, Mainframe, Open VMS |
| **Host Interface** | Fibre Channel, FICON, iSCSI |
| **Host Ports** | 8 to 96 8/16 Gbps FC ports<br>8 to 88 10Gbps iSCSI ports<br>16 to 176 8/16 Gbps FICON ports |
| **Regulatory Approvals** | This product meets all applicable safety and regulatory specifications |
| **Physical Dimensions – XP8 Rack** | |
| **Width x Depth x Height** | 23.6x 45.3 x 81.0 in (60.0 x 115.0 x 205.7 cm) |
| **Typical Weight** | 919 lbs. (417 kg) for 1 DKC pair with 48 SFF drives, host adapters, backend, cache, and cabling included. |

**Environmental Specifications**

| Item | Condition *1 *2 *3 | Model Name |
|---|---|---|
| | | XP8 |
| Temperature range (ºC) | In operation | 10 to 35 |
| | In non-operation | -10 to 43 |
| | In transportation/ Storage | -25 to 60 |
| Relative humidity (%) *4 | In operation | 20 to 80 |
| | In non-operation | 8 to 90 |
| | In transportation/ Storage | 5 to 95 |
| Maximum wet-bulb temperature (ºC) | In operation | 26 |
| | In non-operation | 27 |
| | In transportation/ Storage | 29 |
| Temperature gradient (ºC/hour) | In operation | 10 |
| | In non-operation | |
| | In transportation/ Storage | 20 |
| Dust | In operation | 0.15 or less |
| | In non-operation | — |
| Gaseous contaminant | In operation | Gaseous contamination should be within ANSI/ISA S71.04-2013 G1 classification levels. *5 |
| | In non-operation | |
| Altitude (Limit) (Temperature range) | In operation | 3,050m (10ºC to 28ºC) *6<br>950m (10ºC to 35ºC) |
| | In non-operation | -60m to 12,000m |
| Noise Level (dB) (Recommended) | In operation | 90 or less *7 |

## Technical Specifications

**NOTE**:
[1]: Environmental conditions of operation should be completed before switch-on a system.
[2]: "In non-operation" includes conditions of both packing and unpacking.
[3]: "In transportation/storage" should be conducted in the packing of initial shipping.
[4]: No dew condensation
[5]: ITPD recommends that data centers be kept clean by monitoring and controlling the gaseous contamination.
[6]: Meets the highest allowable temperature conditions and complies with ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) 2011 Thermal Guidelines Class A2. The maximum value of the ambient temperature and the altitude is from 35°C at an altitude of 950m (3000 feet) to 28°C at an altitude of 3050m (1000 feet).
The allowable ambient temperature is decreased by 1°C for every 300m increase in altitude above 950m.
[7]: Fire suppression systems & acoustic noise
Some data center inert gas fire suppression systems when activated release gas from pressurized cylinders that moves through the pipes at very high velocity. The gas exits through multiple nozzles in the data center. The release through the nozzles could generate high-level acoustic noise. Similarly, pneumatic sirens could also generate high-level acoustic noise. These acoustic noises may cause vibrations to the hard disk drives in the storage systems resulting in I/O errors, performance degradation in and to some extent damage to the hard disk drives. Hard disk drives (HDD) noise level tolerance may vary among different models, designs, capacities and manufactures. The acoustic noise level of 90dB or less in the operating environment table represents the current operating environment guidelines in which Hitachi storage systems are designed and manufactured for reliable operation when placed 2 meters from the source of the noise.
Hitachi does not test storage systems and hard disk drives for compatibility with fire suppression systems and pneumatic sirens. Hitachi also does not provide recommendations or claim compatibility with any fire suppression systems and pneumatic sirens. Customer is responsible to follow their local or national regulations.
To prevent unnecessary I/O error or damages to the hard disk drives in the storage systems, Hitachi recommends the following options:

- Install noise-reducing baffles to mitigate the noise to the hard disk drives in the storage systems.
- Consult the fire suppression system manufacturers on noise reduction nozzles to reduce the acoustic noise to protect the hard disk drives in the storage systems.
- Locate the storage system as far as possible from noise sources such as emergency sirens.
- If it can be safely done without risk of personal injury, shut down the storage systems to avoid data loss and damages to the hard disk drives in the storage systems.

**NOTE:** Damage to hard disk drives from fire suppression systems or pneumatic sirens will void the hard disk drive warranty.

## Summary of Changes

| Date | Version History | Action | Description of Change: |
|---|---|---|---|
| 04-Nov-2019 | Version 1 | New | New QuickSpecs |

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

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