HPE XP8 Storage

HPE XP8 Gen2 Storage

HPE XP8 Gen2 Storage is a mission critical flash storage for enterprises requiring Tier-0 storage for mission-critical apps that require absolutely zero downtime. XP8 is the 8th generation in a very successful XP product family first introduced over 20 years ago. The previous generation XP7 Storage was designed as a 7-nines architecture and achieved 100% data availability across the entire installed base. Not a single second of downtime since launch in April 2014, successfully delivering on the XP 100% Data Availability Guarantee. XP8 Storage takes availability a step forward with architecture designed for 8-nines of data 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 titles that drastically reduces storage management and provisioning complexity as well as delivering advanced multi-datacenter high availability, migration, and automation. Essential software for provisioning, managing, and replication are bundled with the XP8 Storage hardware, making it simpler and economical to purchase.

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 with 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.

HPE XP8 Storage

Overview

What's New

- HPE XP Mainframe Cyber Resiliency Solution
- No cost Unlimited External Stroage LTU over 1000TB
- FastSnap Plus - Copyless replication with significant performance and space efficient snapshot benefits

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

Models

Description	SKU
HPE XP8 Hybrid Storage Array	R0L99A
HPE XP8 All Flash Storage Array	R0K99A

Standard Features

Scalability of the HPE XP8 Gen2			
	Min	**increment**	**Max**
DKC (Disk Controller Chassis)	1 Pair	1 Pair	3 Pair
Controllers	2	2*/4	12
Compression Accelerator	0	1 (set of 4)	6 (sets of 4)
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
Data Drives SCM	0	4	96
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 ~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
Encrypted NVMe I/O Backend Module 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
32 Gbps FICON Host Ports with EDiF	8	8	192
Cache w/Encrypted or Non-Encrypted backup	256 GB (8 x32 GB)	256 GB (8 x 32 GB)	6 TB
LDEVs	0	1	65,280

Notes: * 2 Controller increment if upgrading from Base to Performance DKC.

Standard Features

Gen2 Disk Controller Chassis -DKC

The XP8 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), 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.

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 the main SVP fails and needs to be replaced.

Data-In-Place (DIP) upgrade

HPE XP8 customers will gain full Gen2 capabilities and substantial investment protection by implementing XP DIP upgrades. Instead of buying all new infrastructure and migrating data, the XP8 DIP upgrade pairs existing drive media and data with new Gen2 controllers. The upgrade process is 100% online, so there's no impact on production workloads.

Drive Chassis (DKU)/ Media Chassis - DKU

Four types of media chassis are available:

- SBX - SFF HDD/SSD Chassis for 2.5-inch media
- UBX - LFF Drive Chassis for 3.5-inch drives
- FBX - FMD Chassis for Flash Module Devices (FMD)
- NBX - SFF NVMe and SCM Chassis for 2.5-inch media

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.

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.

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.

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

Standard Features

Channel Host Boards- CHB

Channel Host Board (CHB) pairs provide host connections to the HPE XP8 (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. The maximum number of CHB pairs that can be installed in an XP8 is 24 providing 192 ports for host connectivity.

- Max4 CHB pair with a 2DKC 2CTL array
- Max8 CHB pair with a 2 DKC 4CTLarray
- Max16 CHB pair with a 4 DKC 8CTL array
- Max24 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
FICON SW	HPE XP8 32Gb 4-port Mainframe Short Wave Fibre Channel 2-pack Host Bus Adapter - EDiF ready
FICON LW	HPE XP8 32Gb 4-port Mainframe Long Wave Fibre Channel 2-pack Host Bus Adapter - EDiF ready
LW	HPE XP8 16Gb SFP Long Wave 2-pack Transceiver
SW	HPE XP8 16Gb SFP Short Wave 2-pack Transceiver
LW	HPE XP8 32Gb SFP Long 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), or from 2 to 24 DKB pairs for internal storage media connection depending on the number of DKC's. DKB's are determined solely by the number of controllers 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 Controller Boards as well as an encryption software license. Data encryption occurs at the DKB device resulting in encrypted data at rest (DARE) on the drive/media. Encryption DKB's are available for both SAS and NVMe configurations. Please see the software section for information on the HPE XP8 DKB Encryption Software LTU.

HPE XP8 Gen2 Compression Accelerator with Fan Kit

The HPE Compression Accelerator increases the effective capacity and performance of the XP8 array. The accelerator off-loads the data compression workload from the controller CPU, leading to greater overall performance. The accelerator uses the LZ4HC algorithm for improved compression ratios and performance. The accelerator is optional, and only supported on XP8 Gen2.

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. The HPE XP8 contains global mirrored cache. All write data is duplicated in

Standard Features

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. Optional encrypted cache backup can be purchased for added security.

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 an HPE XP8. Assigning cache in this way provides another method for tuning performance for data access for performance critical applications.

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 Devices. The number and type of media installed in HPE XP8 is flexible. Media must be added in minimum groups of four. Additional capacity can be installed over time as capacity needs grow. Depending on media type selected, XP8 uses an industry standard dual ported 12 Gbps SAS interface or NVMe PCIe interface. Each media is connected to both blades of the redundant DKB 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 XP8 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.

Flash Module Device (FMD)

The HPE XP8 supports Flash Module Device's (FMD), which provide solid-state non-volatile high-performance data capacity. FMDs also contain a built-in ASIC that performs data compression, offloading the compression workload from the controller CPU which enables higher performance. FMD capacity can be configured for use in the same way as any other HDD or SSD. FMDs must be added in groups of four or more, and additional capacity can be installed over time as capacity needs increase. Spare FMDs are automatically used in the event of an FMD failure.

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 DKB pair by separate connections.

Notes: The FMD is supported in Mainframe environments, but with FMD compression turned off.

Service Processor

The Service Processor (SVP) manages the HPE XP8 configuration, maintenance activities, and gathers statistical information. The HPE XP8 does not require a functioning SVP for data read/write functionality, but an optional redundant SVP can be added for greater availability of management functions. If the primary SVP fails, the hot standby SVP is switched into operation automatically within approximately six minutes.

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

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Technology Centers (STCs) for 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.

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.

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 delighting customers 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, VMware, and Mainframe 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.
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. 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 management and replication software is included as part of the array purchase. Other advanced software is optional and purchased individually.

- Trial licenses are available for most HPE XP8 software products. Please contact your HPE Sales Representative for details.

Base software suite bundled with XP8 Storage

The HPE XP8 essential software which includes over 20 SW titles such as Intelligent Storage Manager, Data Protection Manager, and Remote Replication Suite, are bundled with the purchase of the XP8 array.

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 mouse clicks.
- 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 XP8 Remote Replication Suite

HPE XP8 Remote Replication Suite offering provides everything need to meet the most demanding availability requirements. Remote Replication Suites combines High Availability, Continuous Access, Continuous Access Journal, 3-Data Center Continuous Access Continuous Access Journal, 3-Data Center Continuous Access Journal / Continuous Access Journal, 3-Data Center High Availability / Center Continuous Access Journal and Business Continuity Manager 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

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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 disaster recovery 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 Business Copy, 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 volumes are configured as Active-Active to provide fourteen 9s availability
- If a failure at Site 1, prevents host access to primary volume, read and write I/O can continue to Site 2 , 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

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

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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
- 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

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 makes 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. All three products are bundled into the Intelligent Management Suite included with the purchase of the array.

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 tracks 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.
- 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.

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 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.

HPE XP8 Performance Advisor Software

Standard Features

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 VM Analytics 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.

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 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 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. Administrators can partition HPE XP8 Storage at a physical level (ports, hosts, LDEVs and Parity Groups) and dedicate those resources 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 where dedicated sub-administrators will manage IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator to retain complete control of HPE XP8 Storage resources.

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 costs.

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.

Notes: The HPE XP8 External Storage Base LTU is included in the base software suite which is included with the purchase of the XP8 array. The HPE XP8 External Storage Base LTU allows for HA quorum to be configured on an external resource. For any other additional external storage requirements up to 1PB, the R0W57A LTU must be ordered. External storage greater than 1PB is licensed at near zero cost using R0W57AB Unlimited External Storage LTU.

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Business Copy makes full 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. The replicated 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 differential copies that might only consume a fraction of the capacity of the primary copy. Only data that is about to be overwritten in the source volume is written to the copy. This is called Copy-after-Write. As a result, the volume capacity required for HPE XP8 FastSnap can be smaller, lowering your capacity costs. Fast Snap Pool Capacity Optimization provides additional efficiencies by re-arranging fragmented data. Fast Snap is recommended for application environments where the I/O to the secondary volume is not write-centric or intensive (reads or writes).

Fast Snap Plus improves upon Fast Snap by providing copyless replication otherwise known as Redirect-on-write. Fast Snap Plus adds further efficiencies to replicating data volumes, leading to significant cost savings and higher performance. Fast Snap Plus is specifically for customers utilizing XP8 dedup and compression capabilities.

Software compression and dedupe for data reduction. Reduces bit cost and overall TCO for HPE XP8 storage. Data reduction is applicable on all media - FMD, HDD, NVMe/SAS SSD, and external storage. Block sizes larger than 64K are processed inline, while smaller block sizes are post-process. Works in conjunction with DKB 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.

Standard Features

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 and where data is collected. 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.

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.

Standard Features

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.
Advanced QoS	Both	Set volume and volume group level upper limits for IOPs and MB/s
Policy-based media sanitization	Both	Set media sanitization policies to erase retired media, eliminating need to send media back to vendor or hire 3rd party.

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.

Standard Features

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.

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. An excellent mainframe data migration solution for long distances (e.g. intercontinental) if migrating from IBM or HV storage to HPE XP8 storage

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

Mainframe Environment

HPE XP8 Mainframe Performance Suite
HPE XP8 Mainframe Performance Suite consists 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)

Standard Features

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

HPE XP Mainframe Cyber Resiliency Solution

HPE XP Mainframe Cyber Resiliency solution provides a way to recover systems from logical data corruption caused by a cyber-attack on the mainframe. Protecting the most critical data and operations beyond physical data corruption and outages.
Key features:

- Customizable to each customer's unique resiliency requirements.
- Creates protected backup data that is not affected by a logical data corruption.
- Enables quick verification and full or partial restoration of protected data.
- Physically air-gaped and isolated vault that contains protected and immutable cyber-copies.

Support
See Service & Support section

Licensing
The License-To-Use is customized based on each customer's unique requirements. Multiples of the following two products will be ordered based on the customization and configuration.

HPE XP Mainframe Cyber Resiliency 1TB E-RTU	R0W60AAE
HPE XP Mainframe Cyber Resiliency Services	R0W60AS

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 data migration when storage systems are replaced. Supported migration paths: XP7/P9500/XP24000/XP20000 to HPE XP8, XP8 to XP8, and now non-XP to XP8).
Always ON Disaster Recovery: By using Online Migration, you can migrate data including data services like Business Copy configuration data while continuing business 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.
These products have a 120-day fixed term license.
Notes:

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

- Some migration paths are only supported when performed by HPE Services.

Product Highlights

Standard Features

- 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
This product has a 120-day fixed term LTU. Licensing must be purchased for the source and target arrays.

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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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.

Standard Features

Notes: 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. External storage licensing structure is tiered.

- HPE XP8 External Capacity Software Suite 1TB 0-1000TB LTU
- HPE XP8 External Capacity Software Suite Unlimited LTU (capacity greater than 1000TB)

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.

HPE XP8 Plug-ins

HPE XP8 Storage supports major plug-ins for VMware, Oracle 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 Modules for Red Hat Ansible
HPE XP8 Storage Modules for Red Hat Ansible enables IT and data center administrators to automate and manage the configuration of HPE storage systems. With HPE XP8 Storage Modules for Red Hat Ansible, the administrator can create playbooks together with logic and the other Ansible modules to automate complex tasks. Administrators can filter, sort, and group the information by piping the output from one module to another. HPE XP8 Storage Modules for Red Hat Ansible tasks can be executed by running simple playbooks written in YAML

Standard Features

syntax and are idempotent.

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.

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

Facilitates automation and orchestration of tasks that involve HPE XP Storage. It augments the capabilities of VMware's vRealize Orchestrator solution by providing access to HPE storage specific workflows.

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 vRops analytics engine to monitor and analyze the performance of the HPE XP8 Storage Array environments.

HPE XP Storage adapter for VMware vCOPS - vCenter Operations Manager

This adapter enables users to bridge the gap between physical and virtual storage infrastructure. Monitor and manage performance and capacity through a single pane of glass.

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 XP Storage Adapters for Oracle Database

Enables Oracle Database Administrators to use Enterprise Manager Cloud Control and Oracle VM Manager to display and manage Oracle databases, and Oracle Virtual Machines hosted on HPE XP storage infrastructure.

Standard Features

HPE XP Storage Adapter for Oracle Linux Virtualization Manager
The HPE XP Storage Adapter for Oracle® Linux Virtualization Manager enables Oracle database and virtual machine monitoring using Oracle Enterprise Manager Cloud Control and Oracle Linux VM Manager.

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.

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.

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

Microsoft System Center Operations Manager
The HPE XP Storage Adapter for Microsoft System Center Operations Manager (SCOM) enables HPE XP storage device configuration, health and alert information to appear in the SCOM console.

HPE XP Storage Plug-in for Containers
Enables collaboration between XP and Docker to create persistent containers for applications that require persistent storage beyond a single host

HPE XP Plug-In for VEEAM Backup and Recovery
Leverage the Veeam Universal Storage API to allow Veeam integration with XP storage arrays for backup and replication jobs, including to and from the cloud.

VAAI vStorage APIs for Array Integration
The HPE Storage VMware® API for Array Integration (VAAI) plugin for HPE XP Storage enables the offloading of some VMware vSphere operations to the storage array. The plug-in offered by HPE supports VAAI primitives such as Write Same, XCOPY, VMSTUN, UNMAP, etc. VAAI interaction is also supported with other XP program products such as Business Copy, Continuous Access, etc.

XP Terraform Storage Adapter
Enables system administrators and Devops environments to quickly and easily automate both core and complex storage related tasks using Terraform resource files.

Support
See Service & Support section

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

Standard Features

HPE XP Cluster Extension Software

HPE XP Cluster Extension Software offers protection against system downtime to critical applications for enterprise customers deploying HPE XP Storage. 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.

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)

Standard Features

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.

Service and Support

Warranty
Warranty level of hardware reactive support is 3 years, 24×7, with 4-hour onsite response.

HPE Services
No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.
https://www.hpe.com/services

Consulting Services
No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.
https://www.hpe.com/services/consulting

HPE Managed Services
HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.
HPE Managed Services | HPE

Operational services
Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.
https://www.hpe.com/services/operational

HPE Complete Care Service
HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

Service and Support

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.
https://www.hpe.com/services/techcare

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:
https://www.hpe.com/services/lifecycle
For a list of the most frequently purchased services using service credits, see the **HPE Service Credits Menu**

Other Related Services from HPE Services:

HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.
https://www.hpe.com/services/training

Defective Media Retention

An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.
Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Service and Support

Parts and Materials
HPE 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 QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

How to Purchase Services
Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at **https://ssc.hpe.com/portal/site/ssc/**

AI Powered and Digitally Enabled Support Experience
Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience.
Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.
https://support.hpe.com/hpesc/public/home/signin

Consume IT On Your Terms

HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are-the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE" **https://www.hpe.com/us/en/contact-hpe.html**
For more information
http://www.hpe.com/services

Other HPE Services

HPE XP Storage Data Migration proven methodology, expertise and tools to help facilitate the XP migration process when migrating data to eligible HPE XP Storage solutions and provide a flexible way to migrate your organization's critical data and minimize impact on your operations.
https://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA6-7229ENW.pdf
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

Service and Support

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.
https://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-8527ENW.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.

https://h20195.www2.hpe.com/V2/GetPDF.aspx/4aa2-3764enw.pdf

HPE Data Replication Solution Service for HPE XP 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://psnow.ext.hpe.com/doc/5982-4153ENN
HPE Data Replication Solution Service for HPE Remote Replication software for HPE XP Disk Array Family configures real-time data mirroring between local and remote storage systems to safeguard critical business information.
https://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-4154enw.pdf
HPE Performance Analysis Service for HPE Storage provides data collection, detailed I/O analysis and enhancement recommendations for HPE Storage arrays.
https://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-6668enw.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://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-9510ENW.pdf

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.

SSP

Description	SKU
HPE XP8 Hybrid Storage Array	R0L99A
HPE XP8 All Flash Storage Array	R0K99A

Notes: 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

Notes: Each HPE XP8 rack is suitable for DKC and DKU racks. The rack SKU includes a key kit.

DKCs - Disk Controller Chassis

HPE XP8 Gen2 Dual Base Disk Controller Chassis R0K82C

Notes: 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 Gen2 Dual Performance Disk Controller Chassis R0K80C

Notes: 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 Gen2 Dual Performance Secondary Disk Controller Chassis R0K81B

Notes:

- Includes: 2 Disk Controller Chassis, each DKC with 2 controllers, XP8 Software Suite RTU, Bezels and Rail Kits.
  - HPE XP8 Upgrade Controller Module (R0K85B)
- Includes: 2 controller upgrade set, XP8 Software Suite RTU.
  - HPE XP8 Controller Module Upgrade PCIe Cable Kit (R0M00A)
  - HPE XP8 Controller Module Fan Kit (R0M10A).

HPE XP8 Gen2 Upgrade Controller Module R0K85B

Data-In-Place Upgrade

HPE XP8 Gen2 Dual Performance Controller Upgrade Kit	R0K96A
HPE XP8 Gen2 Dual Base Controller Upgrade Kit	R0K97A
HPE XP8 Gen2 Dual Secondary Controller Upgrade Kit	R0K98A
HPE XP8 Gen2 Base Software Suite Upgrade 1TB RTU	R0W59A

Compression Accelerator

HPE XP8 Gen2 Compression Accelerator with Fan Kit R0M10B

Media Chassis SBX

Configuration Information

HPE XP8 Small Form Factor Drive Chassis	R0K90A
Notes: 96 slot SFF Drive Chassis with Bezels and Rail Kit.	

Media Chassis NBX

HPE XP8 NVMe Drive Chassis	R0K92A
Notes: 96 slot SFF Drive Chassis with Bezels and Rail Kit.	

Media Chassis UBX

Description	**SKU**
HPE XP8 Large Form Factor Drive Chassis	R0K91A
Notes: 96 slot LFF Drive Chassis with Bezels and Rail Kit.	

Media Chassis FBX

HPE XP8 Flash Module Chassis	R0K93A
Notes: 48 slot Flash Module Chassis with Bezels and Rail Kit.	

Power Distribution Unit (PDU)

HPE XP8 Basic 3-phase 60Hz 4-pack NA/JP PDU	R0L87A
Notes: Includes C19 to C13 adapter cables	
HPE XP8 3-phase 50Hz 2-pack PDU	R0L76A
HPE XP8 Basic 1-phase 60Hz 4-pack NA/JP PDU	R0L86A
HPE XP8 Basic 1-phase 50Hz 4-pack INTL PDU	R0L79A

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 21 and Hub	R0K86B
HPE XP8 Service Processor/Hub LAN Cable Kit	R0L80A
Notes: 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

Notes: 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
Notes: Default to this kit when secondary controller is ordered.	
HPE XP8 QSFP to QSFP 10m 8-pack PCIe Optical Cable	R0M02A
Notes: Can be used instead of R0M01A	

Configuration Information

HPE XP8 QSFP to QSFP 20m 8-pack PCIe Optical Cable	R0M03A
Notes: Can be used instead of R0M01A	
HPE XP8 QSFP to QSFP 30m 8-pack PCIe Optical Cable	R0M04A
Notes: 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
Notes: Disk Adapter controls data transfer between the drives and cache memory.	

eDKA

Description	**SKU**
HPE XP8 Encrypt Backend 4-pk SAS I/O Mod	R0L11A
HPE XP8 Encrypted Backend 4-pack NVMe I/O Module	R0L13A
Notes: 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
Notes: Backend SAS Copper cables - will default for the DKC to SAS Media Chassis connections.	
HPE XP8 QSFP to QSFP 1m 16-pack SAS Metal Cable	R0L91A
Notes: 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
Notes: 1.5m backend SAS Copper cable for connecting to UBX only	
HPE XP8 QSFP to QSFP Basic 8-pack NVMe Metal Cable	R0L98A
Notes: 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
Notes: 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
Notes: 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
Notes: 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
Notes: 30 meter backend SAS Optical cables - can be used for connecting non-adjacent racks	

Cache Memory with Backup Module

HPE XP8 8x32GiB Cache Memory Module	R0L08A
Notes: Consists of 8 32GiB DIMMs	
HPE XP8 8x64GiB Cache Memory Module	R0L09A
Notes: Consists of 8 64GiB DIMMs	
HPE XP8 Gen2 8x32GiB Cache Memory Module	R0L04A
Notes: Consists of 8 32GiB DIMMs	
HPE XP8 Gen2 8x64GiB Cache Memory Module	R0L05A
Notes: Consists of 8 64GiB DIMMs	

Configuration Information

HPE XP8 Gen2 Cache Backup Module	R0L06A
HPE XP8 Gen2 Cache Encryption Backup Module	R0L07A

Notes: Consists of Backup Memory

CHB - Channel Host Boards

HPE XP8 16/32Gb 4-port Fibre Channel 2-pack Host Bus Adapter	R0L24A

Notes:

– 1 Pair of 4 port 16/32Gbps Fibre Channel Host Adapters.

– SFP Transceivers are required to be ordered with R0L24A

Description	SKU
HPE XP8 10Gb 2-port iSCSI 2-pack Host Bus Adapter	R0L30A

Notes: 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

Notes: 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

Notes: 1 Pair of 4 port 16Gbps FICON Longwave Fibre Host Adapters.

HPE XP8 32Gb 4-port Mainframe Short Wave FICON 2-pack Host Bus Adapter	R0L22A

Notes: 1 Pair of 4 port 32Gbps FICON Shortwave Fibre Host Adapters.

HPE XP8 32Gb 4-port Mainframe Long Wave FICON 2-pack Host Bus Adapter	R0L23A

Notes: 1 Pair of 4 port 32Gbps FICON Long Wave Fibre Host Adapters.

Transc eivers

HPE XP8 16Gb SFP Long Wave 2-pack Transceiver	R0L25A

Notes: Pair of 16Gbps Longwave Transceivers

HPE XP8 16Gb SFP Short Wave 2-pack Transceiver	R0L26A

Notes: Pair of 16Gbps Shortwave Transceivers

HPE XP8 32Gb SFP Short Wave 2-pack Transceiver	R0L27A

Notes: Pair of 32Gbps Shortwave Transceivers

HPE XP8 32Gb SFP Fibre Channel Long Wave 2-pack Transceiver	R0L28A

Notes: Pair of 32Gbps Longwave Transceivers

Flash Module FMD

HPE XP8 7TB Flash Module Device	R0L70A
HPE XP8 14TB Flash Module Device	R0L71A

HPE Drives

12G SAS Solid State Drives SFF (2.5")

HPE XP8 1.9TB SAS 12G SFF (2.5in) SSD	R0L51A
HPE XP8 3.8TB SAS 12G SFF (2.5in) SSD	R0L52A
HPE XP8 7.6TB SAS 12G SFF (2.5in) SSD	R0L53A

Configuration Information

HPE XP8 15.3TB SAS 12G SFF (2.5in) SSD	R0L54A
HPE XP8 30TB SAS 12G SFF (2.5in) SSD	R0L55A

12G SAS Hard Disk Drives LFF (3.5")

HPE XP8 14TB SAS 12G 7.2K LFF (3.5in) HDD	R0L61A

12G SAS Hard Disk Drives SFF (2.5")

HPE XP8 2.4TB SAS 12G 10K SFF (2.5in) HDD	R0L67A

NVMe Solid State Drives SFF (2.5")

Description	SKU
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
HPE XP8 30TB NVMe SFF Flash Drive	R0L44A

SCM Solid State Drives SFF (2.5")

HPE XP8 375GB NVMe x4 Lanes SFF (2.5in) Storage Class Memory SSD	R0M20A

Capacity-licensed HPE XP8 Software Product Structure

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.

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

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

Description	SKU
HPE XP8 Automation Director Software Base 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 FICON Encryption Data in Flight 2-pack LTU	R0W63A
HPE XP8 DKA Encryption Frame LTU	R0W47A
Notes: 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 XP8 External Capacity Software Suite 1TB 0-1000TB LTU	R0W57A
HPE XP8 External Capacity Software Suite Unlimited LTU (External capacity over 1000TB)	R0W57AB

Term-based HPE XP8 Software Products

HPE XP8 Online Migration Suite 120-day LTU	R0V01AA
HPE XP7 to XP8 Online Migration Suite 120-day LTU	R0V02AA

System Unit

System Capacity	0 GB - 69.1 PB raw 0 GB - ~60 PB usable
RAID Levels	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 6 (6D + 2P) Recommended RAID 6 (14D + 2P) Recommended
Maximum number of Logical Devices (LDEVs)	65,280
Cache Memory	256 GB - 6 TB
Operating Systems	HP-UX, HPE NonStop, VMWare, AIX, Linux, Windows, Solaris, Mainframe, Open VMS
Host Interface	Fibre Channel (FC NVMe support), FICON, iSCSI
Host Ports	8 to 192 16 Gbps FC ports 8 to 192 32 Gbps FC ports 4 to 96 10Gbps iSCSI ports 8 to 192 16 Gbps FICON Host ports 8 to 192 32 Gbps FICON Host ports, EDiF-ready
Regulatory Approvals	This product meets all applicable safety and regulatory specifications
Physical Dimensions - XP8 Rack	
Width x Depth x Height	23.5 x 50.65 x 78.99 in (59.7 x 128.6 x 200.6 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	-

Technical Specifications

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] 950m (10ºC to 35ºC)
	In non-operation	-60m to 12,000m
Noise Level (dB) (Recommended)	In operation	90 or less [7]

Notes:

– [1]Environmental conditions of operation should be completed prior to system power-up.

– [2]"In non-operation" includes conditions for both packing and unpacking.

– [3]"In transportation/storage" should be conducted in the initial shipment packaging.

– [4]No dew condensation

– [5]HPE recommends that data centers be monitored and controlled for 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 35ºC at an altitude of 950m (3000 feet) to 28ºC at an altitude of 3050m (1000 feet).

– The allowable ambient temperature is decreased by 1ºC for every 300m increase in altitude above 950m.

– [7]Includes 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 resulting in I/O errors, performance degradation, and 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 HPE storage systems are designed and manufactured for reliable operation when placed 2 meters from the source of the noise.

  - HPE does not test storage systems and hard disk drives for compatibility with fire suppression systems and pneumatic sirens.

Technical Specifications

- HPE 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.
- Damage to hard disk drives from fire suppression systems or pneumatic sirens will void the hard disk drive warranty.

– To prevent I/O error or damages to the hard disk drives in the storage systems, HPE recommends the following options:

- Install noise-reducing baffles to mitigate 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.

Summary of Changes

Date	Version History	Action	Description of Change:
16-Sep-2024	Version 16	Changed	Standard Features section was updated.
03-Jun-2024	Version 15	Changed	Overview and Standard Features sections were updated.
01-Apr-2024	Version 14	Changed	Overview, Standard Features, Configuration Information and Additional Options sections were updated.
04-Dec-2023	Version 13	Changed	HPE Services Rebranding
18-Sep-2023	Version 12	Changed	Standard Features and Additional Options sections were updated
07-Aug-2023	Version 11	Changed	Overview, Standard Features, Services and Support, Configuration Information and Technical Specifications sections were updated.
07-Feb-2022	Version 10	Changed	Add Data-In-Place upgrade SKUs
01-Nov-2021	Version 9	Changed	Overview, Standard Features and Configuration Information sections were updated.
19-Apr-2021	Version 8	Changed	Technical Specifications section was updated.
01-Mar-2021	Version 7	Changed	Overview, Standard Features and Configuration Information sections were updated.
07-Dec-2020	Version 6	Changed	Overview, Standard Features and Configuration Information sections were updated.
20-Jul-2020	Version 5	Changed	Overview and Standard Features sections were updated.
01-Jun-2020	Version 4	Changed	Overview, Standard Features and Configuration Information sections were updated.
16-Mar-2020	Version 3	Changed	Standard Features and Service and Support sections were updated.
09-Dec-2019	Version 2	Changed	Overview, Standard Features and Configuration Information sections were updated.
04-Nov-2019	Version 1	New	New QuickSpecs

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Make the right purchase decision. Contact our presales specialists.

Hewlett Packard Enterprise

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

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