

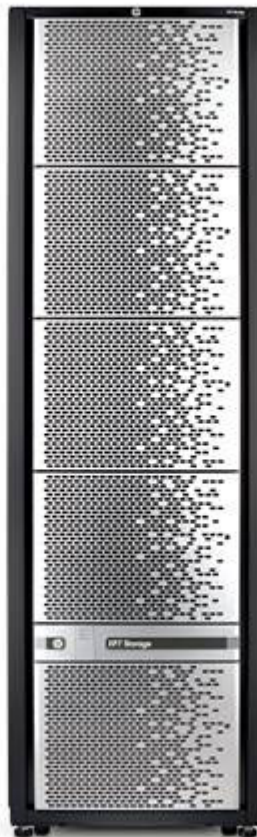
### Overview

### HPE XP7 Storage

The HPE XP7 Storage is an enterprise class data storage platform for disaster proof storage for mission critical environments. Designed for organizations that simply cannot afford any downtime, the XP7 combines an ultra-high-performance on-line scalable fully redundant hardware platform with unique data replication capabilities integrated with clustering solutions for complete business continuity and data protection. The XP7 can adapt to changing business conditions in real time, while increasing data center capacity and lifespan and providing solutions that decrease risk and costs.

The HPE XP7 Software Family decreases the complexities of critical data management. Advanced virtualization based on XP7 multi array virtualization increases availability with fully disaster resistant active-active High Availability and increases data security with secure multi-tenancy. XP software provides extensive disaster recovery solutions for two and three data centers with integrated cluster support. XP External Storage software and XP Thin Provisioning simplify the management of XPs as well as heterogeneous storage systems. Through Smart Tiering organizations can improve capacity utilization, improve storage performance and controls costs. Massive consolidation becomes a reality by managing multiple workloads on a single XP7, including open systems, mainframe, and HPE Non-Stop applications all on a single XP7 with ultra-high performance, low latency and reduced data center cost and reduced total cost of ownership.

The HPE XP7 Storage provides Extreme Availability, Top Performance, and Easy Consolidation for enterprise data centers. .

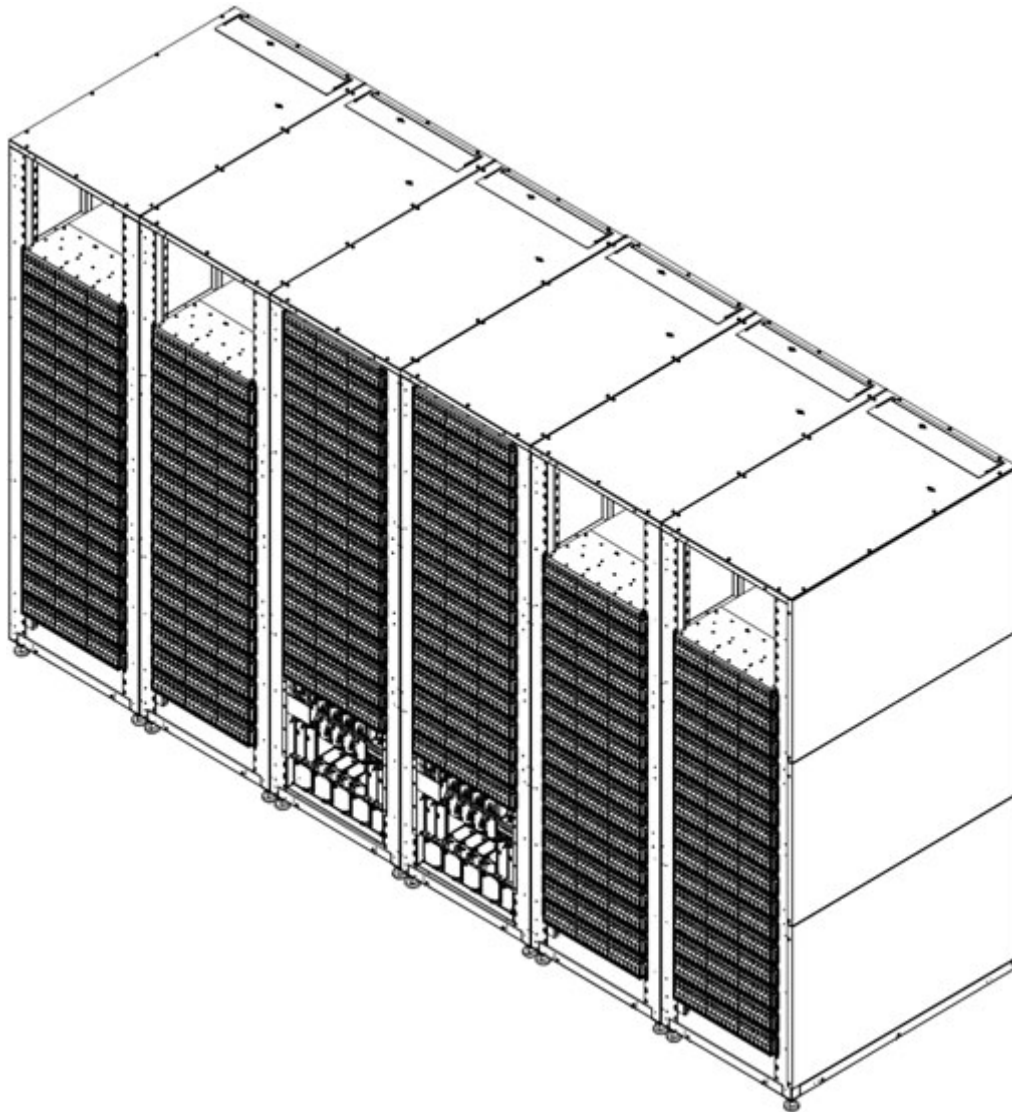


## Overview

## HPE XP7 Storage

<b>Scalability of the HPE XP7</b>			
	<b>MIN</b>	<b>INCREMENT</b>	<b>MAX</b>
<b>Racks</b>	1	1	6
<b>Data Drives SFF</b>	0	4	2304
<b>Data Drives LFF 0</b>	0	4	1152
<b>Data Drives SSD</b>	0	4	384
<b>Data Media Modules FMD</b>	0	4	576
<b>Spare Media</b>	0	1	128
<b>SBX (SFF Media Chassis)</b>	0	1	12
<b>UBX (LFF Media Chassis)</b>	0	1	12
<b>FBX (FMD Media Chassis)</b>	0	1	12
<b>Capacity</b>	0 GB in a diskless configuration	Single parity group of 4 HDD, SSD or FMD	6.8 PB raw 5.9 PB useable
<b>SAS Disk Adapter (DKA) Pairs</b>	0	1	4
<b>Channel Adapter (CHA) Pairs</b>	1	1	12
<b>16 Gbps FC Host Ports</b>	8/16	8/16	96/192
<b>8 Gbps FC Host Ports</b>	16	16	192
<b>10 Gbps FCoE Host Ports</b>	16	16	176
<b>10GBps iSCSI Ports</b>	8	8	88
<b>FICON Host Ports</b>	16	16	176
<b>Cache</b>	32 GB (2 x16 GB)	32 GB (2 x 16 GB)	2 TB
<b>LDEVs</b>	0	1	65,280

## Standard Features



The XP7 hardware consists of one or two DKC racks that will hold up to 2 media form factor chassis in each DKC rack. There are three separate media chassis for 3 media form factors. Each media chassis may contain a maximum of

- 192 Small Form Factor media (SFF HDDs and/or SFF SSDs) each. or
- 96 Large Form Factor Hard disk drives (LFF HDDs ) each, or
- 48 XP Flash Modules (FMD) each.

Media chassis may be ordered as upgrades and placed in racks as a field upgrade.

Each DKC rack can attach to one or two optional DKU racks. The DKU racks may contain one or two media chassis each.

A DKC Rack contains one or two Disk Controller Chassis (DKCs)

- A single DKC rack may contain one or two media chassis.
  - A Dual DKC rack is 2 DKCs in a single rack 2 DKCs are connected to create one high performance system. Such a rack will include two FMD chassis
- A Twin DKC configuration consist of 2 single DKC racks where the DKCs are joined into one high performance DKC system (pictured above)

## Standard Features

A maximum capacity XP7 configuration includes:

- 2 DKC racks with one DKC each, connected for a high performance dual DKC system and 2 media chassis per rack, and 4 DKU racks, each with 2 media chassis

A maximum performance XP7 FMD configuration includes:

- 2 DKC racks with one DKC each, connected for a high performance dual DKC system and 2 FMD chassis,  
OR
- 1 DKC rack with two DKCs, connected for a high performance dual DKC system and 2 FMD chassis

XP7 racks in a single system XP7 may be placed noncontiguous.

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**Disk Controller Chassis - DKC** - The Disk Controller Chassis (DKC) includes one Cache Path Control Adapter (CPEX), one Multi-Processor Blade Pair (MPB), one Service Processor (SVP), Cooling Fans and AC-DC Power Supplies.

One Backup Memory Kit (BKM) is required per CPEX. Batteries and cache flash memories are installed in the Cache Backup Module Kit (BKM) to prevent data loss by the occurrence of power outage or the like.

The options which can be added to a Disk Controller Chassis (DKC) consist of Channel Adapters (CHA), Disk Adapters (DKA), and Multi-Processor Blade Pairs (MPB). A network HUB or Option SVP is required in case additional option MPBs are located in the CHA/MBP location.

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

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

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### Drive Chassis / Media Chassis - DKU

#### Drive Chassis (DKU)

Three types of media chassis are available:

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

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

## Standard Features

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

**Channel Adapter Pairs - CHA** Channel Adapters (CHA) pairs provide connections to host or servers that use the XP7 for data storage (either directly connected to the servers or through SAN switches). CHA pairs also provide connections to External Storage devices and to remote replication devices. CHAs are configured in pairs for redundancy. A minimum of 1 CHA pair is required. The maximum number of CHA pairs that can be installed in one DKC depends on the number of DKAs installed:

- Max 4 CHA pair with 2 DKA pairs installed
- Max 5 CHA pair with 1 DKA pair installed
- Max 6 CHA pair with 0 DKA pair installed

The maximum number of allowed CHA pairs may be reduced depending on the number of additional MPBs.

CHA pairs and transceivers available for use in the XP7 include:

Fibre Channel	HPE XP7 16-port 8Gbps Fibre Host Adapter
Fibre Channel	HPE XP7 8-port 16Gbps Fibre Host Adapter
Fibre Channel	HPE XP7 16-port 16Gbps Fibre Host Adapter
FCoE	HPE XP7 16-port 10Gbps FCoE Host Adapter
iSCSI	HPE XP7 8p 10Gbps iSCSI CHA
FICON SW	HPE XP7 16p 8Gbps MF Shortwave Fibre CHA
FICON SW	HPE XP7 16p 16 Gbps MF Shortwave Fibre CHA
FICON LW	HPE XP7 16p 8Gbps MF Longwave Fibre CHA
FICON LW	HPE XP7 16p 16Gbps MF Longwave Fibre CHA
LW	HPE XP7 8Gbps Longwave SFP Transceiver
LW	HPE XP7 16Gbps Longwave SFP Transceiver
SW	HPE XP7 8Gbps Shortwave SFP Transceiver

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

**Disk Adapter Sets - DKA** The Disk Adapter (DKA) performs all data movement between the drives and Cache Memory. The DKA also provides data protection using RAID 1, RAID 5, and RAID 6.

The XP7 may have zero DKA pairs (for an all External Storage configuration), and from one to up to four DKA pairs for internal storage media connection.

**Encryption Ready Disk Adapter Sets - E-DKA** The XP7 encryption option requires the Encryption Ready Disk Adapters as well as an encryption software license. Data encryption occurs at the DKA device resulting in encrypted data at rest (DARE) on the drive/media.

Please see the software section for information on the HPE XP7 DKA Encryption Software LTU

**Cache Memory** Cache Memory is used to temporarily store data from the host until it is written to drive storage, or to stage data requested by the host from a drive. The XP7 contains global mirrored cache. All write data is

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## Standard Features

duplicated in both cache clusters. Cache control data (Shared Memory) and Cache data is also backed up to SSD for each Cache Memory Adapter in case of power outage (back up battery installed by default) or DKC power off.

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

XP7 Cache Memory can be configured into partitions allocated to particular host/port combinations to ensure that those hosts/ports enjoy optimized performance of cache-oriented I/O. These cache partitions are assigned to specified Array Groups. Up to 32 partitions of at least 4GB can be created in a XP7. Assigning cache in this way provides another method for tuning performance for data access for performance critical applications.

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**Media: HDD / SSD Drives and Flash Modules** The XP7 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 Modules. The number and type of media installed in a XP7 is flexible. Media must be added in minimum groups of four. Additional capacity can be installed over time as capacity needs grow. All XP7 media use the industry standard dual ported 6 Gbps SAS interface. Each media is connected to both blades of the redundant DKA pair by separate connections. Spare media are automatically used in the event of a media failure.

SSDs have a limited number of writes that can occur before reaching the SSD's write endurance limit. The write endurance limit of enterprise MLC SSDs is generally high enough so wear out will not occur during the expected service life of an XP7 under the great majority of configurations, IO patterns, and workloads. The XP7 tracks all writes to e-MLC SSDs and can report the percent of the total write limit that has been used. This allows any SSD approaching the write limit to be proactively replaced before they are automatically spared out.

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### Flash Modules

The XP7 supports Flash Modules, which provide solid-state non-volatile high-performance data capacity. Flash Module capacity can be configured for use in the array in the same way as any other HDD or SSD. The number of Flash Modules that can be installed in a XP7 is flexible. Flash Modules must be added in groups of four or more. Additional capacity can be installed over time as capacity needs grow. Spare Flash Modules are automatically used in the event of a Flash Module failure.

The Gen2 Flash modules achieve better performance without compromising on endurance. They have capacitive charging as opposed to battery based. Hence, there is no periodic charging requirement.

Up to six 48 slot Flash Module Chassis may be configured to each DKC. Flash Module Chassis use the industry standard dual ported 6 Gbps SAS interface. Each Flash Module Chassis is connected to both blades of the redundant DKA pair by separate connections.

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### Service Processor

The Service Processor (SVP) manages the XP7 configuration, gathers statistical information, and is used for some maintenance activities.

The XP7 Storage does not require a functioning SVP in order to make capacity available for reading and writing. However, as external management functions have become dependent on the availability of the SVP in the XP7, some customers may desire to have fast recovery from an SVP failure by having a standby SVP. If the primary SVP fails, the hot standby SVP is switched into operation automatically within approximately six minutes.

The XP7 Continuous Track remote support functions require connection to HPE Insight Remote Support via the internet.

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## Standard Features

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**Continuous Track Remote Support**

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

C-Track also enables the STCs to remotely diagnose certain issues that may exist on the XP7. 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.

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**Server connectivity**

The XP7 connects to a variety of servers and operating systems. For details on which servers and operating systems are currently supported, please contact your resellers and your HPE technical support to review the supported server and operating system information.

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**Switch support details**

The XP7 connects to the leading Fibre Channel, FCoE and iSCSI switches in the industry today. For detailed information on supported switch configurations, please contact your sales representative.

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**Application Solutions**

The HPE XP7 Storage is a member of the HPE XP7 Storage family. The XP7 is ideal for customers running Oracle, Microsoft, SAP, and VMware environments that simply cannot afford any downtime or tolerate any data loss.

The XP7 provides these mission critical application environments with a complete hardware/ software storage solution to decrease risks, lower costs, and accelerate business growth and agility. Data replication and tightly integrated clustering solutions, along with disaster recovery support, enable a multi-site disaster tolerant design to achieve business continuity in the most mission-critical environment.

The XP7 is the premier enterprise-class storage solution for database environments that demand a mission critical solution to meet business and storage demands of Oracle, Microsoft, SAP, and VMware environments with technology that helps drive business success and mitigates risk with constant data availability.

Hewlett Packard Enterprise has developed an in-depth understanding of Oracle, Microsoft, SAP, and VMware technologies by extensive lab-testing best practices with the HPE XP7 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 XP7 array is redundant, hot-swappable, and can be upgraded online.
- Achieve Data Loss Protection to monitor the array around the clock for unseen issues, and investigate and resolve problems proactively and immediately.
- Increase utilization efficiency and reduce storage costs with XP7 Smart Tiers and XP7 Thin Provisioning.
- 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 XP7 ultra high performance configurations and XP7 Flash Modules
- Easily integrate to existing Oracle, Microsoft, SAP, and VMware environments with choice of FC, iSCSI, or SAS attached controllers.

## Standard Features

To learn more about specific HPE Storage Solutions that are built with Oracle, Microsoft, SAP, and VMware environments in mind, visit the solution sites supporting each of these applications.

HPE Storage for Oracle hyperlink to: [\*\*http://www.hpe.com/storage/oracle\*\*](http://www.hpe.com/storage/oracle)

HPE Storage for Microsoft hyperlink to: [\*\*http://www.hpe.com/storage/microsoft\*\*](http://www.hpe.com/storage/microsoft)

HPE Storage for SAP hyperlink to: [\*\*http://www.hpe.com/storage/sap\*\*](http://www.hpe.com/storage/sap)

HPE Storage for VMware hyperlink to: [\*\*http://www.hpe.com/go/vmware/storage\*\*](http://www.hpe.com/go/vmware/storage)



## Technical Specifications

Each XP7 can be a custom configuration. For more information, please contact your reseller or authorized HPE representative to work with the requirements to configure the product correctly.

<b>Rack</b>	<p><b>HP XP7 Storage Rack</b> <span style="float: right;">H6F54A</span></p> <p>Each XP7 rack is suitable for DKC and DKU racks. The rack SKU includes a key kit.</p>
<b>DKCs - Disk Controller Chassis</b>	<p><b>HP XP7 Primary DKC</b> <span style="float: right;">H6F56A</span></p> <p>Includes: Disk Controller Chassis with 1 Multi-Processor Blade Pair (MPB), 1 CPEX, 1 SVP, Bezel and Rail Kit</p> <p><b>HP XP7 Secondary DKC</b> <span style="float: right;">H6F57A</span></p> <p>Includes: Disk Controller Chassis with 1 Multi-Processor Blade Pair (MPB), 1 CPEX, 1 internal HUB, Bezel and Rail Kit</p>
<b>Media Chassis SBX</b>	<p><b>HP XP7 Small Form Factor (2.5 in) Drive Chassis</b> <span style="float: right;">H6F60A</span></p> <p>192 slot SFF Drive Chassis with Bezels and Rail Kit</p>
<b>UBX</b>	<p><b>HP XP7 Large Form Factor (3.5 in) Drive Chassis</b> <span style="float: right;">H6F61A</span></p> <p>96 slot LFF Drive Chassis with Bezels and Rail Kit</p>
<b>FBX</b>	<p><b>HP XP7 Flash Module Chassis</b> <span style="float: right;">H6F62A</span></p> <p>48 slot Flash Module Chassis with Bezels and Rail Kit</p>
<b>PDU - Power Distribution Unit</b>	<p><b>HP XP7 Single Phase 60Hz Power Distribution Unit</b> <span style="float: right;">H6F70A</span></p> <p>Power Distribution Units with 4 power cords</p> <p><b>HP XP7 Three Phase 60Hz Power Distribution Unit</b> <span style="float: right;">H6F71A</span></p> <p>Power Distribution Units with 2 power cords</p> <p><b>HP XP7 Single Phase 50Hz Power Distribution Unit</b> <span style="float: right;">H6F72A</span></p> <p>Power Distribution Units with 4 power cords</p> <p><b>HP XP7 Three Phase 50Hz Power Distribution Unit</b> <span style="float: right;">H6F73A</span></p> <p>Power Distribution Units with 2 power cords</p>
<b>Power Cords</b>	<p><b>HP XP7 60Hz DKC Power Cord</b> <span style="float: right;">H6F80A</span></p> <p>PDU Controller Chassis interconnect power cord sets.</p> <p><b>HP XP7 60Hz DKU Power Cord</b> <span style="float: right;">H6F81A</span></p> <p>PDU Drive Chassis interconnect power cord sets.</p> <p><b>HP XP7 60Hz Flash Module Power Cord</b> <span style="float: right;">H6F82A</span></p> <p>Flash Module Chassis interconnect power cord sets.</p> <p><b>HP XP7 50Hz DKC Power Cord</b> <span style="float: right;">H6F83A</span></p> <p>PDU Controller Chassis interconnect power cord sets.</p> <p><b>HP XP7 50Hz DKU Power Cord</b> <span style="float: right;">H6F84A</span></p>

## Technical Specifications

	PDU Drive Chassis interconnect power cord sets.	
	<b>HP XP7 50Hz Flash Module Power Cord</b>	H6F85A
	Flash Module Chassis interconnect power cord sets.	
	<b>HP XP7 China DKC Power Cord</b>	H6F86A
	PDU Controller Chassis interconnect power cord sets.	
	<b>HP XP7 China DKU Power Cord</b>	H6F87A
	PDU Drive Chassis interconnect power cord sets.	
	<b>HPE XP7 China Flash Module Power Cords</b>	
	Flash Module Chassis interconnect power cord sets.	
<b>SVP</b>	<b>HP XP7 Service Processor</b>	H6F95A
	For redundant array management functions. Required if primary DKC has 3 or more MPB Pairs installed.	
<b>Hub</b>	<b>HP XP7 Internal Hub</b>	H6F97A
	Required if secondary DKC has 3 or more MPB Pairs installed.	
<b>SSP</b>	<b>HP XP7 Storage System</b>	H6F99A
	The XP7 is a Structured Solution Product (SSP). This product number (H6F99A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is a new XP7 order	
<b>DKC connecting kits</b>	<b>HP XP7 5 Meter Cable DKC Interconnect Kit</b>	H6G00A
5, 30 and 100 meter kits to connect primary and secondary controllers.	Default to this kit when secondary controller is ordered	
	<b>HP XP7 30 Meter Cable DKC Interconnect Kit</b>	H6G01A
	Can be used instead of H6G00A.	
	<b>HP XP7 100 Meter Cable DKC Interconnect Kit</b>	H6G02A
	Can be used instead of H6G00A.	
<b>DKC connecting cable kits</b>	<b>HP XP7 5 Meter DKC Cache Path Controller Adapter Interconnect Cable</b>	H6G03A
5, 30 and 100 meter kit to connect additional CPEX in the primary and secondary controllers. If no additional CPEX are installed, these are not needed.	Default to this kit when secondary controller is ordered	
	<b>HP XP7 30 Meter DKC Cache Path Controller Adapter Interconnect Cable</b>	H6G04A
	Can be used instead of H6G03A.	
	<b>HP XP7 100 Meter DKC Cache Path Controller Adapter Interconnect Cable</b>	H6G05A
	Can be used instead of H6G03A.	
<b>DKA</b>	<b>HP XP7 Disk Adapter</b>	H6G06A
	Disk Adapter controls data transfer between the drives and cache memory.	
<b>eDKA</b>	<b>HP XP7 Encryption Ready Disk Adapter</b>	H6G07A
	Encryption is supported with this DKA and optional encryption software LTU.	

## Technical Specifications

<b>MPB – Multi-Processor Blade Pairs</b>	<b>HP XP7 Multi Core Processor Blade</b> Includes 1 Pair of XP7 Multi-Processor Blades, which include DIMMs, CPU and chip set and controls the CHA, DKA, PCI-Express interface, local memory and communication between the SVPs by Ethernet.	H6G08A
<b>Device Interface Cables</b>	<b>HP XP7 1 Meter Copper Intra-chassis Device Interface Cable</b> 1 meter backend SAS Copper cables - will default for the intra-chassis connections	H6G10A
	<b>HP XP7 2 Meter Copper Intra-rack Device Interface Cable</b> 2 meter backend SAS Copper cables - will default for the intra-rack connections (both DKA to Chassis, and Chassis to Chassis)	H6G11A
	<b>HP XP7 4 Meter Copper Inter-rack Device Interface Cable</b> 4 meter backend SAS Copper cables - will default for the inter-rack connections (Chassis to Chassis)	H6G12A
<b>Optical Inter-rack Device Interface Cables</b>	<b>HP XP7 5 Meter Optical Inter-rack Device Interface Cable</b> 5 meter backend SAS Optical cables - can be swapped out for the default inter-rack cables (Chassis to Chassis).	H6G13A
	<b>HP XP7 30 Meter Optical Inter-rack Device Interface Cable</b> 30 meter backend SAS Optical cables - can be swapped out for the default inter-rack cables (Chassis to Chassis).	H6G14A
	<b>HP XP7 100 Meter Optical Inter-rack Device Interface Cable</b> 100 meter backend SAS Optical cables - can be swapped out for the default inter-rack cables (Chassis to Chassis).	H6G15A
<b>CPEX - Cache Path Controller Adapter</b>	<b>HP XP7 Cache Path Controller Adapter</b> Consists of 2 boards to install the cache memory. Each board has 8 CM-DIMM slots. The CPEX connects between MPB, CHA, DKA and BKM by using PCI-Express path and distributes data and sends hot-line signals to the MPB.	H6G20A
<b>Cache Memory Module Pairs</b>	<b>HP XP7 16GB Cache Memory Pair</b> Consists of two 16GB DIMMs	H6G21A
	<b>HP XP7 32GB Cache Memory Pair</b> Consists of two 32GB DIMMs	H6G22A
<b>BKM - Cache Backup Module Kits</b>	<b>HP XP7 Small Backup Memory Kit</b> For use with H6G25A	H6G23A
	<b>HP XP7 Large Backup Memory Kit</b> For use with H6G26A	H6G24A
<b>Cache Backup Memory Pairs</b>	<b>HP XP7 128GB Backup Memory Pair</b> Required for 256GB or less cache memory data backup.	H6G25A

## Technical Specifications

	<b>HP XP7 256GB Backup Memory Pair</b>	H6G26A
	Required for 512GB or less cache memory data backup.	
<b>CHA - Channel Host Adapters</b>	<b>HP XP7 16-port 8Gbps Fibre Channel Host Adapter</b>	H6G30A
	1 Pair of 8 port 8Gbps Fibre Channel Host Adapters	
	<b>HP XP7 8-port 16Gbps Fibre Channel Host Adapter</b>	H6G31A
	1 Pair of 4 port 16Gbps Fibre Channel Host Adapters	
	<b>HP XP7 16-port 16Gbps Fibre Channel Host Adapter</b>	H6G39A
	1 Pair of 8 port 16Gbps Fibre Channel Host Adapter	
	<b>HP XP7 16-port 10Gbps FCoE Host Adapter</b>	H6G38A
	1 Pair of 8 port 10Gbps Fibre Channel over Ethernet Host Adapters	
	<b>HP XP7 8p 10Gbps iSCSI CHA</b>	H6G88A
	1 Pair of 4 port 10Gbps iSCSI Channel Host Adapter	
	<b>HP XP7 16-port 8Gbps Shortwave Fibre Channel Host Adapter for Mainframe</b>	H6G32A
	1 Pair of 8 port 8Gbps FICON Shortwave Fibre Host Adapters	
	<b>HP XP7 16-port 16Gbps Shortwave Fibre Channel Host Adapter for Mainframe</b>	H6G86A
	<b>1 Pair of 8 port 16Gbps FICON Shortwave Fibre Host Adapters</b>	
	<b>HP XP7 16-port 8Gbps Channel Longwave Fibre Channel Host Adapter for Mainframe</b>	H6G33A
	1 Pair of 8 port 8Gbps FICON Longwave Fibre Host Adapters	
	<b>HP XP7 16-port 16Gbps Channel Longwave Fibre Channel Host Adapter for Mainframe</b>	H6G87A
	1 Pair of 8 port 16Gbps FICON Longwave Fibre Host Adapters	
<b>Transceivers</b>	<b>HP XP7 8Gbps Long Wave Fibre Channel SFP Transceiver</b>	H6G34A
	1 8Gbps Longwave Transceiver for one port.	
	<b>HP XP7 16Gbps Long Wave Fibre Channel SFP Transceiver</b>	H6G35A
	1 8Gbps Longwave Transceiver for one port.	
	<b>HP XP7 8Gbps Short Wave Fibre Channel SFP Transceiver</b>	H6G36A
	1 8Gbps Shortwave Transceiver for one port.	
<b>FMD</b>	<b>HP XP7 1.6TB Gen2 FM Device</b>	H6G70B
	<b>HP XP7 3.2TB Gen2 FM Device</b>	H6G71B
	<b>HP XP7 6.4TB Gen2 FM Device</b>	H6G72B
	<b>HP XP7 1.6TB Flash Module Device</b>	H6G70A
	<b>HP XP7 3.2TB Flash Module Device</b>	H6G71A
<b>SFF SSD</b>	<b>HP XP7 400GB MLC SFF (2.5 in) 6G SAS Solid State Drive</b>	H6G60A
	<b>HP XP7 800GB MLC SFF (2.5 in) 6G SAS Solid State Drive</b>	H6G61A
<b>LFF SSD</b>	<b>HP XP7 400GB MLC LFF (3.5in) 6G SAS Solid State Drive</b>	H6G53A
<b>SFF HDD</b>	<b>HP XP7 300GB 15k rpm SFF (2.5 in) 6G SAS Disk Drive</b>	H6G40A
	<b>HP XP7 600GB 15k rpm SFF (2.5 in) 6G SAS Disk Drive</b>	H6G44A

## Technical Specifications

	<b>HP XP7 600GB 10k rpm SFF (2.5 in) 6G SAS Disk Drive</b>	H6G41A
	<b>HP XP7 900GB 10k rpm SFF (2.5 in) 6G SAS Disk Drive</b>	H6G42A
	<b>HP XP7 1.2TB 10k rpm SFF (2.5 in) 6G SAS Disk Drive</b>	H6G43A
	<b>HP XP7 1.8TB 10k rpm SFF (2.5in) 6G SAS Disk Drive</b>	H6G45A
<b>LFF HDD</b>	<b>HP XP7 600GB 6G SAS 10k rpm LFF (3.5 inch) Dual Port Hard Drive</b>	H6G52A
	<b>HP XP7 4TB 6G SAS 7.2k rpm LFF (3.5 inch) Dual Port Hard Drive</b>	H6G51A
	<b>HP XP7 6TB 6G SAS 7.2k rpm LFF (3.5 inch) Dual Port Hard Drive</b>	H6G54A

**Model** HPE XP7 Storage

**Number of Disk Drives** 0 -2304 slots in 1 to 6 racks (single DKC racks hold 2 media chassis and DKU racks hold 2 media chassis each)

### Disk Drives

Drive Specifications	4TB 7.2K	6TB 7.2K	600 GB 10K	900 GB 10K	1.2 TB 10K	1.8 TB 10K	300 GB 15K	600GB 15K
<b>Raw capacity</b> (User area)	3916.14 GB*	5874.22 GB	576.43 GB*	864.64 GB*	1152.79 GB*	1729.29 GB*	288.20 GB*	576.39GB
<b>Rotation speed</b>	7,200 rpm	7,200 rpm	10,000 rpm	10,000 rpm	10,000 rpm	10,000 rpm	15,000 rpm	15,000 rpm
<b>Mean latency time</b>	4.16 ms	4.16 ms	2.99 ms	2.99 ms	3 ms	2.85 ms	2.01 ms	2 ms
<b>Mean seek time</b> (Read/Write)	7.8/8.5 ms	8.5 / 9.5 ms	3.8/4.4 ms	3.7/4.1 ms	4.6/5.0 ms	3.7/4.4 ms	2.9/3.3 ms	2.9 / 3.1 ms
<b>Internal data transfer rate</b>	Up to 276 MB/sec	Up to 276 MB/sec	Up to 253.6 MB/sec	Up to 238.8 MB/sec	Up to 279 MB/sec	Up to 357.4 MB/sec	Up to 242 MB/sec	Up to 399.7 MB/sec
<b>Interface type</b>	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS

### SSD / Flash Modules

Drive Specifications	400 GB (eMLC) SSD	800 GB (eMLC) SSD	1.6TB Flash Module	3.2 TB Flash Module	1.6TB Gen2 Flash Module	3.2TB Gen2 Flash Module	6.4TB Gen2 Flash Module
<b>Raw capacity</b> (User area)	393.85 GB*	787.69 GB*	1759.2GB*	3518.4 GB*	1759.2GB*	3518.4GB*	7036.9GB*
<b>Interface type</b>	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS	Dual ported 6Gbps SAS

\* Based on industry standard, the drive capacity, and therefore the raw data capacity of the XP7, is based on 1K = 1000, not 1024. This means that 1 GB = 1,000,000,000 bytes, not (1024).

### System Capacity

0 GB – 6.8 PB raw

## Technical Specifications

	0 GB - 5.9 PB usable
<b>RAID Levels</b>	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 5 (14D + 2P) RAID 5 (28 D + 4P) RAID 6 (6D + 2P) RAID 6 (14D + 2P) Recommended
<b>Maximum number of Logical Devices (LDEVs)</b>	65,280
<b>Cache Memory</b>	32 GB - 2 TB
<b>Operating Systems</b>	HPE-UX, HPE NonStop, VMWare, AIX, Linux, Windows, Solaris, Mainframe, Open VMS
<b>Host Interface</b>	Fibre Channel, FCoE, FICON, iSCSI
<b>Host Ports</b>	8 to 96 8/16 Gbps FC ports 16 to 192 8 Gbps FC ports 16 to 176 10 Gbps FCoE ports 8 to 88 10Gbps iSCSI ports 16 to 176 8/16 Gbps FICON ports
<b>Regulatory Approvals</b>	This product meets all applicable safety and regulatory specifications
<b>Physical Dimensions - DKC Rack</b>	<b>Width x Depth x Height</b> 24.1 x 43.8 x 79.0 in (61.0 x 111.2 x 200.6 cm) <b>Max Weight</b> 1775 lbs. (807 kg) for 1 DKC rack with 384 SFF drives <b>Max Weight</b> 1852 lbs. (842 kg) for 2 DKC single rack with 96 FMD
<b>Physical Dimensions - DKU Rack</b>	<b>Width x Depth x Height</b> 24.1 x 43.8 x 79.0 in (61.0 x 111.2 x 200.6 cm) <b>Max Weight</b> 1393 lbs. (633 kg) for 1 DKU rack with 384 SFF drives <b>Max Weight</b> 1459 lbs. (663 kg) for 1 DKU rack with 192 LFF drives
<b>Shipping Dimensions DKC &amp; DKU Racks</b>	<b>Width x Depth x Height</b> 37.4 x 50.8 x 86.9 in (95.0 X 129.0 X 220.5 cm) <b>Max Weight of Packaging per Rack</b> 166 lbs. (75 kilos)

## Environmental Specifications

Item	Condition		
	Operating <sup>1</sup>	Non-operation <sup>2</sup>	Shipping & Storage <sup>3</sup>
Temperature (°C)	16 to 32	-10 to 43 -10 to 35 <sup>10</sup>	-25 to 60
Relative Humidity (%) <sup>4</sup>	20 to 80	8 to 90	5 to 95
Max. Wet Bulb (°C)	26	27	29
Temperature Deviation (°C/hour)	10	10	20
Vibration <sup>5</sup>	5 to 10Hz: 0.25 mm 10 to 300Hz: 0.49m/s <sup>2</sup>	5 to 10Hz: 2.5mm 10 to 70Hz: 4.9m/s <sup>2</sup> 70 to 99Hz: 0.05mm	<sup>6</sup> Sine Vibration: 4.9m/s <sup>2</sup> , 5min.

## Technical Specifications

		99 to 300Hz: 9.8m/s <sup>2</sup>	At the resonant frequency with the highest displacement found between 3 to 100Hz
			<sup>6</sup> Random Vibration: 0.147m <sup>2</sup> /s <sup>3</sup> , 30min, 5 to 100Hz
Shock	-	78.4m/s <sup>2</sup> , 15ms	<sup>8</sup> Horizontal: Incline Impact 1.22m/s
			<sup>9</sup> Vertical: Rotational Edge 0.15m
Altitude	-60 to 3,000m		-

### NOTES:

<sup>1</sup> The requirements for operating condition should be satisfied before the storage system is powered on.

Maximum temperature of 32°C should be strictly satisfied at air inlet portion.

The recommended operational room temperature is 21°C to 24°C.

<sup>2</sup> Non-operating condition includes both packing and unpacking conditions unless otherwise specified.

<sup>3</sup> For shipping and storage, the product should be packed with factory packing.

<sup>4</sup> No condensation in and around the drives/media should be observed under any conditions.

<sup>5</sup> The vibration specifications apply to all three axes.

<sup>6</sup> See ASTM D999-01 The Methods for Vibration Testing of Shipping Containers.

<sup>7</sup> See ASTM D4728-01 Test Method for Random Vibration Testing of Shipping Containers.

<sup>8</sup> See ASTM D5277-92 Test Method for Performing Programmed Horizontal Impacts Using an Inclined Impact Tester.

<sup>9</sup> See ASTM D6055-96 Test Methods for Mechanical Handling of Unitized Loads and Large Shipping Cases and Crates.

<sup>10</sup> When FMDs are installed.

### Accessories

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

### Safety

This product meets all applicable safety and regulatory specifications

## Service and Support, HP Care Pack, and Warranty Information

### Warranty

Warranty level of hardware reactive support is 3 years, 24x7, with 4-hour onsite response

For more information about Hewlett Packard Enterprise Global Limited Warranty and Technical Support, visit:

<http://h18004.www1.hpe.com/storage/warranty.html>

### Service and Support

#### Services to accelerate time to results

HPE Storage Services bring you a rich portfolio of consulting and support services designed to add value to our core storage products and solutions. We have the know-how and experience to put storage technology to work for you. We work closely with you as your strategic partner, leveraging our full services portfolio to make sure that everything works to optimize your enterprise.

Choose from services aligned to our storage product offerings and lifecycle. From mission-critical onsite services to innovative web-based remote support, you choose the precise level of attention and support your business demands.

#### What HPE Storage Technology Services can do for you

HPE Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HPE storage lifecycle support services offer a full spectrum of customer care—from technology support to complex migrations to complete managed services.

#### Choose the right level of support, deployment and integration services

HPE support recommendations are designed to help you enhance technology operations and lower risk—and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs—Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only Hewlett Packard Enterprise brings together deep expertise, proactive and business critical support and a strong partner network—plus, a full set of infrastructure services designed to power a Converged Infrastructure.

### Discover, plan, and design

Choose from a rich portfolio of services to make the most of HPE XP7 Storage, so you can efficiently and affordably consolidate, manage, and extract value from unstructured data. Start here to understand your data protection options. Next, develop a methodical plan and design the optimal Storage that addresses your unique technology requirements.

**HPE Storage Efficiency Analysis** - HPE Storage Efficiency Analysis (SEA) combine tool-based fact gathering and Hewlett Packard Enterprise expertise for a quick path to identify immediate issues and their resolution, and helps customer realize the benefits of HPE Storage Technology.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-6727ENW.pdf>

**HPE Storage Impact Analysis** - This service provides assessment service to analyze your current storage and evaluate the impact of change to the infrastructure. It is ideal for customers looking to achieving top utilization of your storage technology and assessing the likely impact of data growth and future projects that require storage.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-1174ENW.pdf>



## Service and Support, HP Care Pack, and Warranty Information

**HPE Storage Modernization service** - Storage Modernization helps customers seamlessly position themselves to effectively integrate the latest technological advancements in storage. It helps clients modernize, reduce costs, and improve quality of service through the execution of process and technology changes to achieve demand management.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-4620ENW.pdf>

### Deploy and integrate

**Implement HPE XP7 Storage correctly-right from the start-so you can count on reduced risk and accelerated deployment, while implementing a best-practice configuration from day one.**

**HPE XP Storage Installation and Startup Service** - Installs, configures, and tests your HPE XP7 hardware and software onsite. We deliver deployment of your XP7 storage properly integrated into your environment.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-4064ENW.pdf>

**HPE Storage Data Migration Service** - End-to-end data migration service providing seamless discovery, assessment, planning, and design, completely customizable to your organization's storage area network (SAN) or network attached storage (NAS) environment and using innovative software to help you migrate to HPE storage quickly and efficiently.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf>

**HPE Enhanced Implementation Service for SANs** - HPE delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-8527EN.pdf>

**HPE Data Replication Solution Service** - Configuration of real-time data mirroring or snapshot capabilities of HPE Business Copy and Continuous Access to safeguard your critical business information.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-4153EN.pdf>

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-4154EN.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.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-3764ENW.pdf>

**HPE Proactive Select** - A flexible way to purchase services to fit your environment with an extensive menu of HPE Proactive Select event and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf>

### Operate and support

**HPE Performance Analysis Service** - Data collection, detailed input/output (I/O) analysis, and enhancement recommendations to improve HPE Storage disk array performance, stability, and availability by identifying potential problems and understanding the possible solutions that will help avoid them.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-1669ENW.pdf>

**Optimized Care**- delivers best performance and

**Choose the right support to maximize uptime, free up your resources, and achieve improved value-as you get the most out of the existing IT assets while accelerating time-to-revenue.**

## Service and Support, HP Care Pack, and Warranty Information

stability through

deployment and proactive management practices

**HPE Critical Service** - Provides proactive activities and 24x7 monitoring of your environment making it the right choice when uninterrupted uptime is essential. We implement improvement projects to mitigate risks and reduce incidents to maximize uptime. If outages do occur, they will be addressed immediately through access to our dedicated critical support escalation resources, with a six-hour call-to-repair commitment from our mission-critical call center.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf>

**Standard Care**-maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support

**HPE 6-hour Call-to-Repair Proactive Care Service with Personalized support option** - Provides an integrated set of reactive and proactive services designed to help you improve the stability and performance of your converged infrastructure, including six-hour call-to-repair hardware support. The Personalized Support option provides onsite technical advice, Hewlett Packard Enterprise best practice sharing and support reviews from an assigned account support manager.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-8855ENW.pdf>

**Basic Care**-Minimum recommended support

**HPE 4-hour 24x7 Proactive Care Service with Personalized support option** - Provides an integrated set of reactive and proactive services designed to help you improve the stability and performance of your converged infrastructure, including 4-hour onsite hardware support. The Personalized Support option provides onsite technical advice, Hewlett Packard Enterprise best practice sharing and support reviews from an assigned account support manager.

<http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-8855ENW.pdf>

**HPE Education Services** - Comprehensive training for new, as well as experienced, storage administrators designed to expand your skills and keep you up to speed with the latest storage and virtualization technology from HPE Storage.

<http://education.hpe.com/curr-storsan.htm>

**For more information**

<http://www.hpe.com/services/storage>

To learn more on HPE Storage Services, please contact your HPE sales representative or HPE Authorized Channel Partner

HPE Care Pack Services are sold by HPE and HPE Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.

## Capacity-licensed XP7 Software

### HPE XP7 Software Products

The HPE XP7 family offers a complete portfolio of software applications designed to help you confidently manage your XP7 Storage.

The software offerings can be grouped into several major categories as follows:

- Device and Configuration Management
- Performance Management
- High Availability and Replication
- Business Continuity Solutions
- Mainframe-connect Tools

For additional information regarding HPE XP7 Software products, refer to the following:

- Trial licenses are available for most XP7 software products. Please contact your HPE Sales Representative for details.
- For more information on XP7 Software, please refer to the HPE XP7 Licensing compendium.

### What's New

- Standalone SKU for XP7 High Performance FICON® Connectivity Software (the software is also bundled with Mainframe Performance Suite)
- New Active-Active High Availability capability – HPE XP7 High Availability Software
- HA Management capability with CVAE 8.0.1

## HPE XP7 Array Manager Suite

### Overview

HPE XP7 Array Manager Suite consists of Array Manager software, Resource Partition software, External Storage Software, Thin Provisioning Software and Command View Advanced Edition Suite.

Array Manager software provides web-based volume management, resource allocation, access control, and data security for your XP7 Storage. Configure and manage data volumes for most effective use of your XP7. 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 XP7 so that you have efficient access to your data. Create read-only volumes for archiving and data retention, and securely delete your data when necessary.

Thin Provisioning Software allows you to supply storage capacity to your applications from a pool of virtualized storage. By enabling you to allocate your anticipated future storage capacity needs from virtual storage, HPE XP7 Thin Provisioning Software reduces the amount of physical drive capacity initially required. As utilization of physical drive space increases over time, you can purchase more drive capacity as it is needed, and install it without affecting your applications. By removing the guessing from capacity planning, HPE XP7 Thin Provisioning reduces the cost of volume management.

Resource Partition allows role based access control of XP7 resources. It allows storage administrators to partition XP7 resources, at Physical and logical level and to assign these resources to sub-administrators while retaining overall control. Administrators can partition a XP7 Storage at a physical

## Capacity-licensed XP7 Software

level (ports, hosts, LDEVs and Parity Groups) and dedicate part of their arrays for specific requirements. They can also partition at a logical level (Host Groups and LDEVs) and keep Ports, Parity Groups and External Storage as a shared infrastructure.

HPE XP7 Resource Partition software is ideal for a multi-tenant environment set up where dedicated sub-administrators need to manage the IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator retain complete control of XP7 Storage resources. Datacenter administrators can decide to partition XP7 Storage resources either at a logical level to improve storage utilization efficiency or at a physical level to improve quality of service and avoid data and access breaches across multiple tenants.

HPE XP7 External Storage allows you to host XP7 Storage LUNs on select external storage subsystems. XP7 External Storage allows you to tier storage capabilities and provision a XP7 solution to optimize return on IT investment - letting you focus high-performance/high availability native XP7 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 XP7 appear to a server to be stored inside the XP7.

XP7 External Storage provides significant consolidation scalability - up to 247 Petabytes (PB) of external storage can be configured behind a single XP7 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your XP7 solution to simplify configuration complexity and reduce ongoing management cost. XP7 External Storage is compatible with a wide range of XP7 software tools, including XP7 Business Copy for local replication, XP7 Continuous Access for remote replication, and XP7 Auto LUN for performance optimization.

HPE XP7 Command View Advanced Edition Software provides centralized, web-based management for XP7 Storage. It reduces total cost of ownership by enabling collaboration among team members and by increasing the efficiency of storage administrators.

**NOTE: HPE XP7 Array Manager Suite is a required product for all XP7 Storage implementations, except Mainframe-only environments.**

### Models

HP XP7 Array Manager Suite Base LTU	TK914AA
HP XP7 Array Manager Suite 1TB 0-100TB LTU	TK914AB
HP XP7 Array Manager Suite 1TB 101-250TB LTU	TK914AC
HP XP7 Array Manager Suite 1TB 251-500TB LTU	TK914AD
HP XP7 Array Manager Suite 1TB Over 500TB LTU	TK914AE

### Product Highlights

HPE XP7 Array Manager software provides several important capabilities. The following table lists the functions included in XP7 Array Manager software.

Function Name	Supported Systems	Description
LUN Manager	Open Systems	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.
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	Mainframe	Create custom size mainframe volumes that are smaller than

## Capacity-licensed XP7 Software

(VLVI)		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	Open Systems	Improve performance by reserving areas of Cache Memory for frequently accessed data. Also known as Cache LUN.
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 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 XP7 Continuous Access, 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
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 XP7 by using the XP7Info command line utility.

In summary, HPE XP7 Array Manager Suite provides the following capabilities:

- Add or delete I/O paths
- Configure Host ports
- Create expanded LUNs
- Create custom size volumes (Mainframe and Open Systems)
- Establish volume host access permissions (Mainframe and Open Systems)
- Partition parity groups, cache, and host ports
- Control port bandwidth available to hosts
- Create read-only volumes for archiving and data retention (Mainframe and Open Systems)
- Reserve cache memory for frequently accessed data (Mainframe and Open Systems)
- Securely delete data (Mainframe and Open Systems)
- Automate array configuration and management tasks using the bundled in XP7 Command View AE CLI

## Capacity-licensed XP7 Software

- Interface with SRM software platforms using the bundled in XP7 Command View AE SMI-S provider

### Support

- See Service & Support section

### Licensing

- See Capacity-Licensed XP7 Software section
- For the XP7 Storage, license-to-use is based on the total internal and external usable capacity of the array **(NOTE: The licensed capacity must cover all internal and external usable capacity)**

## HPE XP7 Array Manager Conversion Suite

### Overview

HPE XP7 Array Manager Conversion Suite is used to provide a upgrade path to customers for moving from mainframe only environment to a mixed environment comprising of both open and mainframe system.

For pure open system environment, HPE XP7 Array Manager Suite is a mandatory title. Similarly, for pure mainframe environment, HPE XP7 Mainframe Basic Suite is a mandatory title. XP7 Conversion Suite is required for customers moving from mainframe only to both mainframe and open system environment.

HPE XP7 Array Manager Conversion Suite also includes the XP7 Command View Advanced Edition Suite[XP7 CVAE Suite]

HPE XP7 Array Manager Conversion Suite is licensed by internal and external usable capacity

### Models

HP XP7 Array Manager Conversion Suite Base LTU	TK934AA
HP XP7 Array Manager Conversion Suite 1TB 0-100TB LTU	TK934AB
HP XP7 Array Manager Conversion Suite 1TB 101-250TB LTU	TK934AC
HP XP7 Array Manager Conversion Suite 1TB 251-500TB LTU	TK934AD
HP XP7 Array Manager Conversion Suite 1TB Over 500TB LTU	TK934AE

### Product Highlights

Function Name	Supported Systems	Description
LUN Manager	Open Systems	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.
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	Open Systems	Improve performance by reserving areas of Cache Memory for frequently accessed data. Also known as Cache LUN.
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.
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 XP7 by using the XP7Info command line utility.

## Capacity-licensed XP7 Software

XP7 CVAE Suite	Open Systems	provides centralized, web-based management for XP7 Storage to manage the normal, replication and HA volumes
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### Support

- See Service & Support section

### Licensing

- See Capacity-Licensed XP7 Software section
- " For the XP7 Storage, license-to-use is based on the total internal and external usable capacity of the array (**NOTE: The licensed capacity must cover all internal and external usable capacity, XP7**)

## HPE XP7 High Availability Software

### Overview

HPE XP7 High Availability (HA) Software is an Active-Active High Availability Solution offering on HPE XP7 Storage. XP7 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 XP7 Multi Array Virtualization capability. HPE XP7 High Availability Software supports two use cases: Active-Active HA and Active-Active Access.

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

The HA Virtual Storage Machine feature is new to the XP product line. Multi Array Virtualization (MAV) 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 XP7 arrays up to a synchronous distance and provides delta re-sync capability in case of failure/maintenance.

HA can be combined with any of the other traditional mirroring program product like BC, Fast Snap to make additional copies. HA requires a quorum device located on an external storage device.

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

### Models

HP XP7 High Availability Software Base LTU	TK955AA
HP XP7 High Availability Software 1TB 0-100TB LTU	TK955AB
HP XP7 High Availability Software 1TB 101-250TB LTU	TK955AC
HP XP7 High Availability Software 1TB 251-500TB LTU	TK955AD
HP XP7 High Availability Software 1TB Over 500TB LTU	TK955AE

### Product Highlights

- Provides Active-Active High Availability
- 100% Storage uptime in the event of an array or datacenter failure
- Non-disruptive, transparent VM or clustered application mobility between hosts (Active-Active Access)
- HA CLI management through XP7 Array Manager Suite(or MF Basic Suite + Array Manager Conversion Suite) and HA GUI Management through Command View Advanced Edition

## Capacity-licensed XP7 Software

- Works with general multipath software. HDLM is not mandatory.
- Support for external volumes

### Support

- See Service & Support section

### Prerequisites

- XP7 Array Manager Suite or (XP7 Mainframe Basic Suite+XP7 Array Manager Conversion Suite)

### Licensing

- License-to-use is based on the total used capacity of the XP7 volumes to be configured for HA
- See Capacity-Licensed XP7 Software section.

## HPE XP7 Three Data Center High Availability Suite

### Overview

With the HPE XP7 3DC HA solution, XP7 Storage arrays on two sites replicate data synchronously while configured for Active-Active High Availability, while the XP7 Storage on a third site many miles away protects against a regional disaster that hits the first two. Lose any of the sites and the other two keep going. When the “down” sites come back up the data is re-synched again to the full 3DC HA solution.

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

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

- The **HA pair** volume are configured for Active-Active setup to provide for 14 9s availability
- If a failure at Site A, prevents host access to primary volume at Site A, read and write I/O can still continue to Site B , providing continuous server I/O to the data volume
- In a server-cluster configuration, HA pair need not be suspended/resynchronized during server failover/failback
- Server load balancing without storage impact

### 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

### Upgrade path for existing DR customers to move to 3DC HA Suite advanced DR

- Existing CA Suite customers can upgrade to 3DC HA Suite by ordering XP7 CA to 3DC HA Suite upgrade option
- Existing HA SW customers can upgrade to 3DC HA Suite by ordering XP7 HA to 3DC HA Suite upgrade option



## Capacity-licensed XP7 Software

- It enables customers to migrate to advanced DR solution while protecting the investment on existing solution

### Models

HP XP7 Three Data Center High Availability Suite Base LTU	TK965AA
HP XP7 Three Data Center High Availability Suite 1TB 0-100TB LTU	TK965AB
HP XP7 Three Data Center High Availability Suite 1TB 101-250TB LTU	TK965AC
HP XP7 Three Data Center High Availability Suite 1TB 251-500TB LTU	TK965AD
HP XP7 Three Data Center High Availability Suite 1TB Over 500TB LTU	TK965AE
HP XP7 Continuous Access to Three Data Center High Availability Base LTU	TK961AA
HP XP7 Continuous Access to Three Data Center High Availability 1TB 0-100TB LTU	TK961AB
HP XP7 Continuous Access to Three Data Center High Availability 1TB 101-250TB LTU	TK961AC
HP XP7 Continuous Access to Three Data Center High Availability 1TB 251-500TB LTU	TK961AD
HP XP7 Continuous Access to Three Data Center High Availability 1TB Over 500TB LTU	TK961AE
HP XP7 High Availability to Three Data Center High Availability Base LTU	TK960AA
HP XP7 High Availability to Three Data Center High Availability 1TB 0-100TB LTU	TK960AB
HP XP7 High Availability to Three Data Center High Availability 1TB 101-250TB LTU	TK960AC
HP XP7 High Availability to Three Data Center High Availability 1TB 251-500TB LTU	TK960AD

### Product Highlights

- HPE XP7 High Availability to Three Data Center High Availability 1TB Over 500TB LTU

### Support

- See Service & Support section

### Prerequisites

- No prerequisites

### Licensing

- License-to-use is based on the total used capacity of the XP7 volumes to be configured for 3DC HA solution
- See Capacity-Licensed XP7 Software section

## HPE XP7 Continuous Access to High Availability Conversion

### Overview

HPE XP7 Storage has an option for existing XP7 Continuous Access Suite customers to convert to XP7 High Availability software for enhanced features and capabilities.

HPE XP7 Continuous Access to High Availability Conversion SKU is primarily intended for existing XP7 Storage customers running XP7 CA Suite on their array but looking for upgrading to the XP7 High Availability software for enhanced features and capabilities including Active-Active HA configuration.

The XP7 Continuous Access to High Availability Conversion SKU requires XP7 Continuous Access

## Capacity-licensed XP7 Software

Suite as a pre-requisite on the XP7 Storage array before the SKU could be applied to leverage the XP7 High Availability software feature and functionalities.

<b>Models</b>	HP XP7 Continuous Access to High Availability Conversion Base LTU	TK950AA
	HP XP7 Continuous Access to High Availability Conversion 1TB 0-100TB LTU	TK950AB
	HP XP7 Continuous Access to High Availability Conversion 1TB 101-250TB LTU	TK950AC
	HP XP7 Continuous Access to High Availability Conversion 1TB 251-500TB LTU	TK950AD
	HP XP7 Continuous Access to High Availability Conversion 1TB Over 500TB LTU	TK950AE
<b>Product Highlights</b>	<ul style="list-style-type: none"> <li>• Upgrade path from XP7 CA Suite to XP7 HA SW</li> <li>• The SKUs enable existing XP7 Storage with XP7 CA Suite installed to leverage XP7 HA capabilities</li> </ul>	
<b>Support</b>	<ul style="list-style-type: none"> <li>• For See Service &amp; Support section</li> </ul>	
<b>Prerequisites</b>	<ul style="list-style-type: none"> <li>• XP7 Continuous Access Suite</li> </ul>	
<b>Licensing</b>	<ul style="list-style-type: none"> <li>• License-to-use is based on the total used capacity of the XP7 volumes to be configured for HA</li> <li>• See Capacity-Licensed XP7 Software section</li> </ul>	

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## HPE XP7 Command View Advanced Edition Suite

**Overview** HPE XP7 Command View Advanced Edition suite consists of HPE XP7 Command View Advanced Edition Software and HPE XP7 Replication Manager.

HPE XP7 Command View Advanced Edition Software provides centralized, web-based management for XP7 Storage. It reduces total cost of ownership by enabling collaboration among team members and by increasing the efficiency of storage administrators. It can be used together with the Remote Web Console software shipped free with every HPE XP7 Storage. In an environment with many HPE XP7 Storage systems, with complex replication, or with a need to migrate data among tiers of storage, HPE XP7 Command View AE provides the device management capability you need. It allows you to manage multiple HPE XP7 Storage systems from a central location. It provides the ability to install optional plug-in applications for enhanced functionality like visualizing complicated replication environments or non-disruptively migrating data between tiers of storage. HPE XP7 Command View AE includes a Command Line Interface (CLI) to automate disk array configuration and management and includes an SMI-S provider to interface with SRM software. The Device Manager CLI can perform Smart IOPH propagation for remote copy for open systems. Due to Smart IOPH propagation, during failover scenarios, target Smart pool will take over IOPH of source Smart pool to ensure immediate performance. This feature is currently supported for XP7 in open systems environment.

XP7 Command View AE also includes the Provisioning Manager functionalities. Provisioning Manager was a separate product in the previous generation (XP) software portfolio. With XP7, Provisioning Manager product has been integrated with XP7 CVAE.

## Capacity-licensed XP7 Software

The CVAE CLI/SMI-S capabilities are conveniently included with the XP7 Storage Controller. There is also a native CLI/SMI-S included with the SVP for XP7 Storage. Refer to the Remote Web Console section for more details on the differences of the 2 CLI/SMI-S capabilities.

CVAE enables High Availability Management. Through the GUI. All activities from setting up the HA to creating and deleting HA volumes and maintaining HA status is enabled through CVAE. HPE XP7 Replication Manager Software enables you to create, manage, and maintain HPE XP7 Storage replication pairs. It provides centralized management of replication applications, decreases storage administration complexity, increases productivity, and improves service levels by providing a single enterprise view of the replication environment. It allows you to view replication status graphically in real time, improving your efficiency.

In addition to replication status, HPE XP7 Replication Manager Software also provides early warning of impending problems. It eliminates tedious data entry that can cause outages and simplifies difficult replication tasks. In addition, it reduces costs and training expenses associated with replication management.

**NOTE: HPE XP7 Replication Manager only requires the CLI/SMI-S portion of XP7 Command View AE.**

- Single visual point of management for all replication tasks
- Create, manage, and monitor Open Systems replication pairs, and monitor Mainframe replication pairs
- Makes managing replication easier for the Storage Administrator
- Manages and monitors local as well as remote replication pairs
- Reports pair status
- Displays the pair configurations relative to servers and subsystems
- Remote management of replication pairs

Set up and control multi-site DR environments

### Models

HP XP7 Command View Advanced Edition Suite Base LTU	TK981AA
HP XP7 Command View Advanced Edition Suite 1TB 0-100TB LTU	TK981AB
HP XP7 Command View Advanced Edition Suite 1TB 101-250TB LTU	TK981AC
HP XP7 Command View Advanced Edition Suite 1TB 251-500TB LTU	TK981AD
HP XP7 Command View Advanced Edition Suite 1TB Over 500TB LTU	TK981AE

### Product Highlights

- Includes Provisioning Manager functionalities.
- Wizard-based dialog modules for ease of use.
- Provides for seamless integration into higher-level infrastructure management utilities such as Storage Operations Manager (SOM) (former Storage Essentials).
- Centralized, multi-array health and status management for XP7, XP24000, XP20000, XP12000, and XP10000 arrays
- Flexible Administrative Security configuration
- Supports Graphical User Interface (GUI), and Command Line Interface (CLI)
- Integration with enterprise framework applications such as OpenView, Tivoli, and BMC
- Easy access from GUI to Remote Web Console by selecting physical view
- Support for High Availability management through CVAE GUI
- Support for VMware vSphere 6.0
- Support for customer executable online migration from XP24K and P9500 to XP7
- Email notification for task completion

## Capacity-licensed XP7 Software

### Support

- See Service & Support section

### Prerequisites

- XP7 Command View Advanced Edition Management Station (provided separately by customer). Please contact your HPE Sales Representative for the latest details.
  - Windows Server 2008/32-bit and x64; Windows Server 2008 R2/x64; Windows 7/32-bit and x64; Windows Server 2003/32-bit and x64; Windows Server 2003 (SP1)/32-bit; Windows Server 2003 (SP2)/32-bit and x64; Windows XP Professional (SP2, SP3); Windows Vista/32-bit; Windows Vista (SP1)/32-bit; SuSE Linux 10/32-bit and x64; VMware, Hyper-V
  - 1 GHz CPU minimum, 2 GHz CPU or faster is recommended
  - 1 GB RAM minimum, 2 GB or greater is recommended
  - 4 GB free drive space minimum, 5 GB or greater is recommended
  - At least one Ethernet LAN card connected to network

### Licensing

- For XP7 Storage: License-to-use is based on the total usable (internal+external) capacity of the XP7 being managed.
- As more LDEVs are configured in the array, additional licensing for XP7 Command View AE must also be purchased to cover the newly configured LDEVs.
- The HPE XP7 Command View AE CLI SMI-S License is included with the XP7 Storage. It entitles you to use the SMI-S provider and the core command line interface (CLI) of HPE XP7 Command View Advanced Edition Suite. The core CLI has all the capabilities of the full CLI except the logical group commands. For more information about CLI features, see the HPE XP7 Command View Advanced Edition Suite Device Manager CLI user guide. To install the HPE XP7 Command View AE CLI SMI-S License, first obtain a license key using the registration number from the HPE XP7 Command View AE CLI SMI-S License Entitlement Certificate. Next, install HPE XP7 Command View AE using the Server Installation DVD from the media kit. Then install the CLI SMI-S license key (previously obtained) using the License button in the HPE XP7 Command View AE web client login window. For installation instructions, see the HPE XP7 Command View Advanced Edition Suite server installation and configuration guide for Device Manager. To use all the features of HPE XP7 Command View Advanced Edition Suite, purchase and install the HPE XP7 Command View AE license.

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## Applications integrated with HPE XP7 Command View AE

### HPE XP7 Tiered Storage Manager Software

#### XP7 Command View AE Plug-in

##### Overview

HPE XP7 Tiered Storage Manager is a plug-in application for XP7 Command View AE that transparently migrates XP7 data (including internal and externally connected) among storage tiers, seamlessly and without down time. It lets you take advantage of various storage tiers to better manage system cost and performance. XP7 Tiered Storage Manager includes the data migration functionality of XP7 Auto LUN.

When integrated with HPE XP7 Performance Advisor, Tiered Storage Manager reports Array Group Busy Rates, allowing you to consider performance implications before migrating data.

**NOTE:** If you require automatic performance-based migration, purchase HPE XP7 Auto LUN. HPE

## Capacity-licensed XP7 Software

XP7 Auto LUN includes data migration functionality and performance monitoring functionality. Only the data migration functionality of XP7 Auto LUN is included with HPE XP7 Tiered Storage Manager.

<b>Models</b>	HP XP7 Tiered Storage Manager Software Base LTU	TK985AA
	HP XP7 Tiered Storage Manager Software 1TB 0-100TB LTU	TK985AB
	HP XP7 Tiered Storage Manager Software 1TB 101-250TB LTU	TK985AC
	HP XP7 Tiered Storage Manager Software 1TB 251-500TB LTU	TK985AD
	HP XP7 Tiered Storage Manager Software 1TB Over 500TB LTU	TK985AE

### Product Highlights

- Transparent migration - no need to disrupt or quiesce applications
- Non-disruptive to users
- Migrates data for both Internal or External Storage (MSA/EVA/XP7)
- Provide persistent volume classifications (Migration Groups)
- Provide easily customizable available storage pools (Storage Tiers)
- No limit to the number of Storage Tiers - Volumes can reside within multiple tiers
- Easy search operations for building Migration Groups and Storage Tiers
- Easy realignment to accommodate changes
- Migrations are batched together but are manually released
- Reports Array Group Busy Rates, when integrated with HPE XP7 Performance Advisor. XP7 Performance Advisor v5.3 and XP7 Command View AE v7.3 provide the best combination of features and performance.

### Support

- See Services/Support section

### Prerequisites

- **Software**
  - HPE XP7 Command View Advanced Edition Suite

### Licensing

- For the XP7 Storage: The License-To-Use is based on the sum of the total internal usable capacity of the XP7 Storage plus the configured usable capacity of all External Storage LUNs attached to the XP7 Storage.

## HPE XP7 Online Migration Suite

### Overview

HPE XP7 Online Migration Suite enables customers to perform the migration themselves through an intuitive user interface. The Online Migration product is used for the data migration when storage systems are replaced (In this case from XP24000/XP20000 to XP7).

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

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

**NOTE: XP7 Storage also has a services led online data migration offering performed by the trained professionals from HPE Services.**

<b>Models</b>	HP XP7 Online Migration Suite Base LTU	TK971AA
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## Capacity-licensed XP7 Software

HP XP7 Online Migration Suite 1TB 0-100TB LTU	TK971AB
HP XP7 Online Migration Suite 1TB 101-250TB LTU	TK971AC
HP XP7 Online Migration Suite 1TB 251-500TB LTU	TK971AD
HP XP7 Online Migration Suite 1TB Over 500TB LTU	TK971AE
HP XP7 Online Migration Suite 60-day Frame LTU	TK971A

### Product Highlights

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

### Support

- See Services/Support section

### Prerequisites

- No prerequisite

### Licensing

- The License-To-Use is based on the sum of the total usable capacity of the XP7 Storage.

## HPE XP7 Remote Web Console

### Overview

Remote Web Console is shipped free of charge with the array firmware on the SVP. It is accessible by customers and provides basic single XP7 Storage management. It can be easily accessed by the XP7 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 XP7 Storage includes a native CLI/SMI-S provider.

**NOTE: There are 2 separate CLI/SMI-S providers shipped with XP7 Storage now - SVP CLI/SMI-S provider and CVAE CLI/SMI-S provider. The SVP CLI/SMI-S provider is included with the SVP. The CVAE CLI/SMI-S provider is shipped as a part of XP7 Storage Controller and is included on a separate CVAE media kit.**

CVAE SMI-S is what is referred to as a "proxy" SMI-S provider since it resides on a separate server that is not an integral part of the array. When the Array itself implements the SMI-S such as it is with is on the XP7 SVP, it is referred to as an "embedded" provider. The industry trend is toward embedded providers. In general they should provide better overall response times and do not suffer as much from synchronization issues as proxy providers. For example the CVAE SMI-S data, comes out of the CVAE database which as we know can have synchronization lags with the array.

### Models

No product or license is required to be ordered, it comes free with the XP7 firmware on the SVP.

### Licensing

No license key required, product is pre-enabled and comes free with every XP7 Storage.

## HPE XP7 Cache Partition

## Capacity-licensed XP7 Software

<b>Overview</b>	Improve performance by reserving areas of cache to store frequently accessed data. Divide Cache into up to 32 logical partitions and configure dedicated Cache for critical applications to improve their performance.
<b>Models</b>	Included with HPE XP7 Array Manager - see section for more details
<b>Product Highlights</b>	Isolate applications by subdividing the XP P9000 Storage cache into smaller independent partitions
<b>Support</b>	See Service & Support section
<b>Licensing</b>	License-to-use for unlimited storage capacity on one XP7 Storage

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## HPE XP7 DKA Encryption Software

<b>Overview</b>	XP7 DKA Encryption software enables the encryption capability for all the data that stored on the internal drives of the XP7 Storage. The Enhanced DKA encrypts the data on drives so that data cannot be read off a drive that is removed from the XP7. Only data on the drives is encrypted (data in cache is not encrypted).	
<b>Models</b>	HP XP7 DKA Encryption Software LTU	TK901A
<b>Support</b>	See Service & Support section	
<b>Licensing</b>	License-to-use for unlimited storage capacity on one XP7 Storage	

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## XP7 External Storage

<b>Overview</b>	<p>HPE XP7 External Storage allows you to host XP7 Storage LUNs on select external storage subsystems. XP7 External Storage allows you to tier storage capabilities and provision a XP7 solution to optimize return on IT investment - letting you focus high-performance/high availability native XP7 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 XP7 appear to a server to be stored inside the XP7.</p> <p>XP7 External Storage provides significant consolidation scalability - up to 247 Petabytes (PB) of external storage can be configured behind a single XP7 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your XP7 solution to simplify configuration complexity and reduce ongoing management cost. XP7 External Storage is compatible with a wide range of XP7 software tools, including XP7 Business Copy for local replication, XP7 Continuous Access for remote replication, and XP7 Auto LUN for performance optimization.</p> <p>Note that the XP7 External Storage does not have a separate license. It is included in XP7 Array Manager Suite</p>
<b>Licensing</b>	<ul style="list-style-type: none"> <li>Included in XP7 Array Manager Suite.</li> </ul>

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## HPE XP7 Resource Partition Software

<b>Overview</b>	HPE XP7 Resource Partition allows role based access control of XP7 resources. It allows storage administrators to partition XP7 resources, at Physical and logical level and to assign these resources to sub-administrators while retaining overall control. Administrators can partition a XP7 Storage at a physical level (ports, hosts, LDEVs and Parity Groups) and dedicate part of their arrays for specific requirements. They can also partition at a logical level (Host Groups and LDEVs) and keep Ports, Parity Groups and External Storage as a shared infrastructure.
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## Capacity-licensed XP7 Software

HPE XP7 Resource Partition software is ideal for a multi-tenant environment set up where dedicated sub-administrators need to manage the IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator retain complete control of XP7 Storage resources. Datacenter administrators can decide to partition XP7 Storage resources either at a logical level to improve storage utilization efficiency or at a physical level to improve quality of service and avoid data and access breaches across multiple tenants.

### Models

Included in HPE XP7 Array Manager Suite

### Product Highlights

- Assign role based access controls to sub-administrators to modularize IT infrastructure management, even with a central IT infrastructure resource pool.
- Useful for cloud service providers and for organizations with consolidated IT infrastructure, providing a platform to multiple tenants to host storage and charging as per usage.
- Maximize XP7 Storage resource utilization with shared resources such as Ports, Parity Groups and External Storage, and dedicated resources such as host groups and LDEVs, with logical partitioning of XP7 Storage.
- Create resource groups based on the needs of your customers or business units, helping to ensure that quality of service and data secrecy requirements are met with hardware based partitioning.

### Licensing

- Included in XP7 Array Manager Suite.

## HPE XP7 RAID Manager

### Overview

HPE XP7 RAID Manager provides OS-specific, host based software initiated from a server via a command line interface that allows full user control of HPE XP7 Continuous Access and HPE XP7 Business Copy from the host server. XP7 RAID Manager also provides functionality for synchronized operation with cache and OS, etc. If launching from a host using scripts, a consulting engagement may be recommended. XP7 RAID Manager also provides host agent/command support for HPE Data Retention Utility (LUN Security XP Extension) based solutions (see Data Retention Utility for more information).

### Models

Included with XP7 Array Manager

### Product Highlights

- Host-resident integration of XP7 Software

### Support

- See Service & Support section

### Licensing

- NA: product provided at no charge

## HPE XP7 Cache LUN (also known as Cache Residency)

### Overview

HPE XP7 Cache LUN lets you reserve areas of memory cache on your HPE XP7 Storage to store frequently accessed information. It improves file access times and enables faster data transfers. Assigning information to on-board cache speeds up access to your data because cache-resident data is available at host data transfer speeds for both read and write operations. XP7 Cache LUN redirects I/O requests from the XP7 drives to data locked in the array's cache. It is transparent, it is simple to implement, and the performance gains it delivers are immediate.

### Models

Included with HPE XP7 Array Manager - see section for more information

### Product Highlights

- XP7 Storage Firmware based
- Lock data in cache memory



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## Capacity-licensed XP7 Software

- Flexible user configuration
- Scalable

**Support** • See Service & Support section

**Licensing** • See Capacity-Licensed XP7 Software section

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## HPE XP7 Performance Control

**Overview** HPE XP7 Performance Control is a web-based performance allocation tool for XP disk arrays. It lets you align IT priorities with storage performance resources and allows these resources to be intelligently allocated to hosts. It lets you prioritize critical systems by making sure that they have all the XP disk array performances they need to meet business objectives. You can also ensure that business processes (like backups and data warehouse loads) get the array bandwidth they need to complete within targeted time windows. XP7 Performance Control enables sophisticated service provider solutions based on performance level quality-of-service. Because it ensures that array resources are best used, it improves ROI of your XP disk array solution.

**Models** HPE XP7 Storage  
Included with HPE XP7 Array Manager - see section for more information.

**Product Highlights**

- Set Upper Limit function to cap performance on non-priority hosts
- Set Threshold Value function to relax policies when priority host performance consumption is low
- Set WWN and Port level settings
- Determine IOPS or MB/s settings for random or sequential I/O-oriented processing workloads
- Define Host Bus Adapter names to allow intuitive naming of hosts
- Define Host Bus Adapter group names to allow intuitive naming of hosts

**Support** • See Service & Support section

**Licensing** • License-to-use for unlimited storage capacity on one XP Disk Array

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## HPE XP7 Data Shredder (also known as Volume Shredder)

**Overview** HPE XP7 Data Shredder is a software product designed for the enterprise storage market and is supported on the XP7. It helps IT staff by securely deleting data on the XP7 Storage via successive overwrites to minimize the likelihood that the deleted data could be restored. This may help to promote peace of mind and improved data security for high security environments that use the XP7. It will be most useful for sensitive financial data or high security data in a variety of industries.

**Models** Included with HPE XP7 Array Manager Suite - see section for more information.

**Product Highlights**

- Overwrites data volumes up to 8 times
- User selectable overwrite patterns
- Ease of use
- Verification that overwrites have been completed
- Percentage of completion display
- Abort feature to stop the process

## Capacity-licensed XP7 Software

- Support**
- See Service & Support section
- Licensing**
- License-to-use for unlimited storage capacity on one XP7 Storage

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## HPE XP7 Smart Tiers Software

### Overview

HPE XP7 Smart Tiers improves storage performance and controls costs by transparently migrating data to appropriate tiers of storage within the HPE XP7 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.

Real Time Tiering: Smart Tier 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.

### Models

HP XP7 Smart Tiers Software Base LTU	TK916AA
HP XP7 Smart Tiers Software 1TB 0-100TB LTU	TK916AB
HP XP7 Smart Tiers Software 1TB 101-250TB LTU	TK916AC
HP XP7 Smart Tiers Software 1TB 251-500TB LTU	TK916AD
HP XP7 Smart Tiers Software 1TB Over 500TB LTU	TK916AE

### Product Highlights

- Improve Performance
  - Frequently accessed data is always in the fastest tier. Highly utilized Thin Provisioning pages are relocated to the fastest drives in the pool.
  - Tier relocation is performed periodically, either automatically or manually based on performance monitoring algorithm.
- Optimize resource utilization
  - Expensive fast tiers of storage are always holding the most frequently accessed data only
  - Pages are allocated to upper tiers as long as the performance potential of each tier (group of pool volumes) is not exceeded.
  - Enhanced tiering policy for migrating pages between tiers for better resource utilization
  - Drive coexistence in a Tier. Supports multiple tiers for external storage
- Reduce management cost
  - Set data migration policies for continued enhanced performance, saving on management time to keep the XP7 at its optimal performance.
  - Option setting enables detailed setting of Tier Management, Cycle Time, and Monitoring Period.
  - Supports both Open systems and Mainframe systems.
- Real time tiering
  - Seconds to sub-seconds cycle time as against 30 minutes cycle time with regular Smart Tier
  - RTT(Round Trip Time) with lower response time capabilities.

## Capacity-licensed XP7 Software

- Rapid response to workload changes for applications

### Support

- See Service & Support section

### Prerequisites

- XP7 Smart Tiers works with Thin Provisioning pages, XP7 Thin Provisioning is already bundled with Array Manager Suite.

### Licensing

- License to use is based on the total capacity of the thin provisioning pool managed by Smart Tiers

## HPE XP7 Auto LUN Software

### Overview

HPE XP7 Auto LUN Software provides web-based automatic or manual monitoring and load balancing for all your XP7 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 XP7 Auto LUN does the rest. It proposes a migration plan and even estimates how much your storage performance will improve when it is done. XP7 Auto LUN lets you evaluate array usage and determine whether resources are overloaded or out of balance. Use its easy-to-follow menus to define when data is collected and arrays are monitored. It makes spotting trends simple, using up to 90 days of stored historical data to create up-to-the-minute reports. You can even export data to third-party analysis tools like Microsoft Excel. If resources are overloaded, XP7 Auto LUN will create a plan to move volumes, then stands by for your approval to make changes.

### Models

HP XP7 Auto LUN Software Base LTU	TK915AA
HP XP7 Auto LUN Software 1TB 0-100TB LTU	TK915AB
HP XP7 Auto LUN Software 1TB 101-250TB LTU	TK915AC
HP XP7 Auto LUN Software 1TB 251-500TB LTU	TK915AD
HP XP7 Auto LUN Software 1TB Over 500TB LTU	TK915AE

### Product Highlights

- Identifies data volumes stressed by high I/O workloads
- Moves high priority data to underutilized array volumes
- Creates a volume migration plan
- Migrates data across different drives or RAID levels
- Virtually assures successful volume migration with "Never Give Up" mode option

### Support

- See Service & Support section

### Licensing

- See Capacity-Licensed XP7 Software section, Licensed by total usable capacity (internal + external).

## HPE XP7 Performance Advisor Software

### Overview

HPE XP7 Performance Advisor Software is a web-based application for collecting, monitoring, and displaying the performance of your XP7 Storage. With XP7 Performance Advisor, you choose the time and duration of performance data collection-so you can pinpoint activities that significantly affect your XP7 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

## Capacity-licensed XP7 Software

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 XP7 Storage.

Performance Advisor integrates with HPE XP7 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.

<b>Models</b>	HP XP7 Performance Advisor Software Base LTU	TK990AA
	HP XP7 Performance Advisor Software 1TB 0-100TB LTU	TK990AB
	HP XP7 Performance Advisor Software 1TB 101-250TB LTU	TK990AC
	HP XP7 Performance Advisor Software 1TB 251-500TB LTU	TK990AD
	HP XP7 Performance Advisor Software 1TB Over 500TB LTU	TK990AE

**NOTE: The HPE XP7 Performance Advisor Base License includes the media kit.**

### Product Highlights

- Real time data gathering and analysis
- System view of all array resources
- Dashboard for quick review of XP7 performance status
- Macro view of applications to quickly isolate and troubleshoot performance problems
- Graphical presentation of array component metrics in form of charts
- Enhanced troubleshooting
- Metrics for other products running on XP array like Thin Provisioning , Smart Tiers, CA
- Detailed performance report generation and scheduling
- Flexible event notification and large 320 GB historical repository
- Multi-OS support
- Multiple management stations support
- Coexistence of Windows-based host agent and Windows-based management station on the same server (not recommended for large configurations)
- XP7 Storage External Storage performance monitoring
- Integrates with HPE XP7 Tiered Storage Manager (Requires Performance Advisor and HPE XP7 Command View AE. Performance Advisor and Command View AE provide the best combination of features and performance.)
- VMware VVOL support – To identify ALU/SLU

### Support

- See Service & Support section

### Prerequisites

- **Management Station** for standalone deployment (provided separately by customer)
  - Management Server on its own management station
    - **Supports single core, dual-core, and quad-core processors**
  - 3-GHz CPU, 4-GHz CPU (recommended for large configurations > 2GB database)
  - 2 GB RAM (minimum), 4 GB RAM (recommended for large configurations > 2GB database)
  - 10 GB free drive space (minimum), 320GB free drive space (for maximum history detail)
  - NTFS
  - DVD drive
  - VGA monitor with 256 colors or better
  - At least one LAN Card
- **Host Agent:** refer to the HPE XP7 Performance Advisor Installation Guide
- **Minimum Array Firmware** - refer to the release notes associated with the particular version of Performance Advisor

## Capacity-licensed XP7 Software

- Licensing**
- For XP7 Storage, License-to-use is based on total installed usable (internal + external) capacity. See Capacity-Licensed XP7 Software section for more details.
- 

## HPE XP7 Plug-ins

**Overview**

HPE XP7 Storage supports all the major plug-ins for VMware and Microsoft which are critical for the High End storage requirements. For the OpenStack community, XP7 Storage has its own cinder driver for integrating with cloud. Below are some major plug-ins for XP7.

### **HPE XP7 Storage Replication Adapter Software for VMware vCenter SRM**

HPE XP7 Storage Replication Adapter (SRA) Software for VMware vCenter SRM. The SRA, developed for 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 XP7 disk arrays. SRA is also used to discover XP7 DR Groups and ensure DR Group is in synchronized state prior to failing VM from local to remote site.

### **HPE XP7 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.

### **HPE XP7 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.

#### **View Function**

- The View function is used to display the storage system information registered in the XP7 Storage Plug-in, the datastore on ESXi using the storage system, and virtual machine information

#### **Provision Datastore Function**

- The Provision Datastore function allows for one-step creation of a datastore on an ESXi Host LDEV on XP7 Storage is assigned to the specific Host Group or iSCSI target and the datastore using the detected LDEV is created

#### **Delete Datastore Function**

- It's a one-step operation that removes a datastore and underlying LDEV from the XP7 Storage registered to the XP7 Storage plug-in

## Capacity-licensed XP7 Software

### HPE XP7 Performance Advisor Adapter for VMware vCOPS

HPE XP7 Performance Advisor Adapter for VMware vCOPS 1.0 provides integrated performance and configuration details to the vCenter Operations Manager custom Graphical User Interface (GUI). The software uses the VCOPs analytics engine to monitor and analyze the performance of the HPE XP7 Storage Array environments.

### HPE XP7 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

XP7 VASA provider will match the requests from vSphere (via storage policy profiles) with XP7 Storage(via capability profiles).

### HPE XP7 Storage Cinder Volume Driver

To support the need that large organizations and service providers have for Enterprise class storage on cloud:

- XP7 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 XP7 Cinder driver will be qualified with OpenStack Liberty release
- See Service & Support section

#### Support

#### Licensing

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

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## Mainframe Environment

### HPE XP7 Mainframe Basic Suite

#### Overview

HPE XP7 Mainframe Basic Suite consist of mainframe related software features, thin provisioning software, resource partition software and external storage software

Basic mainframe software features provides web-based volume management, resource allocation, access control, and data security for your XP7 Storage. Configure and manage data volumes for most effective use of your XP7. 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 XP7 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.

## Capacity-licensed XP7 Software

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 XP7 Thin Provisioning Software reduces the amount of physical drive capacity initially required. As utilization of physical drive space increases over time, you can purchase more drive capacity as it is needed, and install it without affecting your applications. By removing the guessing from capacity planning, HPE XP7 Thin Provisioning reduces the cost of volume management.

Resource Partition allows role based access control of XP7 resources. It allows storage administrators to partition XP7 resources, at Physical and logical level and to assign these resources to sub-administrators while retaining overall control. Administrators can partition a XP7 Storage at a physical level (ports, hosts, LDEVs and Parity Groups) and dedicate part of their arrays for specific requirements. They can also partition at a logical level (Host Groups and LDEVs) and keep Ports, Parity Groups and External Storage as a shared infrastructure.

HPE XP7 Resource Partition software is ideal for a multi-tenant environment set up where dedicated sub-administrators need to manage the IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator retain complete control of XP7 Storage resources. Datacenter administrators can decide to partition XP7 Storage resources either at a logical level to improve storage utilization efficiency or at a physical level to improve quality of service and avoid data and access breaches across multiple tenants

HPE XP7 External Storage allows you to host XP7 Storage LUNs on select external storage subsystems. XP7 External Storage allows you to tier storage capabilities and provision a XP7 solution to optimize return on IT investment - letting you focus high-performance/high availability native XP7 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 XP7 appear to a server to be stored inside the XP7.

XP7 External Storage provides significant consolidation scalability - up to 247 Petabytes (PB) of external storage can be configured behind a single XP7 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your XP7 solution to simplify configuration complexity and reduce ongoing management cost. XP7 External Storage is compatible with a wide range of XP7 software tools, including XP7 Business Copy for local replication, XP7 Continuous Access for remote replication, and XP7 Auto LUN for performance optimization.

**NOTE: HPE XP7 Mainframe Basic Suite is a required product for all XP7 Storage Mainframe implementations**

### Models

HP XP7 Mainframe Basic Suite Base LTU	TK924AA
HP XP7 Mainframe Basic Suite 1TB 0-100TB LTU	TK924AB
HP XP7 Mainframe Basic Suite 1TB 101-250TB LTU	TK924AC
HP XP7 Mainframe Basic Suite 1TB 251-500TB LTU	TK924AD
HP XP7 Mainframe Basic Suite 1TB Over 500TB LTU	TK924AE

### Product Highlights

Function Name	Supported Systems	Description
Volume Manager	Mainframe	Create volumes of specific sizes desired as well as provision volumes using regular or thin provisioning. Volume Manager allows you to change the volume configuration in the array to address changing requirements.
Cache Residency	Mainframe	Improve performance by reserving areas of Cache Memory for

## Capacity-licensed XP7 Software

Manager for Mainframe		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 Monitor	Both	Monitor usage, workload, and performance of drives, volumes, processors, and host interfaces in the XP7 Storage. View the information in graphical formats
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	retrieves storage performance data via in-band (CCW) interface and stores storage performance data into SMF data sets
Volume Security for Mainframe	Mainframe	Volume security for mainframe attached XP Disk Arrays that protects volumes from access by unauthorized hosts.

### Support

- See Service & Support section

### Licensing

- Mainframe Basic Suite is licensed by total usable capacity(internal + external)

## HPE XP7 Mainframe Performance Suite

### Overview

HPE XP7 Mainframe Performance Suite consist of Compatible PAV, Compatible Hyper 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 XP7 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.

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

### Models

HP XP7 Mainframe Performance Suite Base LTU	TK944AA
HP XP7 Mainframe Performance Suite 1TB 0-100TB LTU	TK944AB
HP XP7 Mainframe Performance Suite 1TB 101-250TB LTU	TK944AC



## Capacity-licensed XP7 Software

HP XP7 Mainframe Performance Suite 1TB 251-500TB LTU	TK944AD
HP XP7 Mainframe Performance Suite 1TB Over 500TB LTU	TK944AE

**Support**

- See Service & Support section

**Licensing**

- Mainframe Performance Suite is licensed by used capacity

## HPE XP7 Mainframe Tiering Suite

**Overview** HPE XP7 Mainframe Tiering Suite consists of Smart Tiers software and Smart Manager for MF software

HPE XP7 Smart Tiers software improves storage performance and controls costs by transparently migrating data to appropriate tiers of storage within the HPE XP7 Storage. Smart Tiers manages data in thin provisioning pools. It monitors performance at the page level and can migrate the 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.

Real Time Tiering: Smart Tier 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.

HPE XP7 Smart Manager for Mainframe software 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.

<b>Models</b>	HP XP7 Mainframe Tiering Suite Base LTU	TK926AA
	HP XP7 Mainframe Tiering Suite 1TB 0-100TB LTU	TK926AB
	HP XP7 Mainframe Tiering Suite 1TB 101-250TB LTU	TK926AC
	HP XP7 Mainframe Tiering Suite 1TB 251-500TB LTU	TK926AD
	HP XP7 Mainframe Tiering Suite 1TB Over 500TB LTU	TK926AE

**Support**

- See Service & Support section

**Prerequisite**

- Thin Provisioning is a requirement for Mainframe Tiering bundle

**Licensing**

- Mainframe Tiering Suite is licensed by used capacity

## HPE XP7 Business Copy Software

**Overview** HPE XP7 Business Copy makes nearly instantaneous copies of data from XP7 Storage for development, testing or backup, without ever interrupting your online production. XP7 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

## Capacity-licensed XP7 Software

degradations for your primary applications. These copy volumes can at any time be "split" from their corresponding source volume and accessed by other applications. Therefore, while copy volumes are being utilized, primary applications can continue to access and update their source volumes as needed, without taking a performance hit. By creating multiple online copies of critical business data without disrupting your business, XP7 Business Copy lets you get the most from your data.

Fast Snap is a feature of Business Copy that also replicates data volumes. However, it is slightly different in that it makes space-efficient secondary copies that might only be a fraction of the size of the primary copy. Only data that is about to be overwritten in the primary volume is written to the secondary volume. This is called Copy-after-Write. As a result, if the volume capacity required for Snapshot XP7 can be smaller, then the cost of replication can be lowered. Fast Snap is recommended for application environments where the I/O to the secondary volume is not write-centric or intensive (reads or writes).

These secondary copies are also known as "virtual volumes", or V-VOL. All V-VOLs reside in a snapshot pool, or POOL-VOL, which is sized based on the number of V-VOLs and the IO ratio of the primary volumes associated with these V-VOLs.

<b>Models</b>	HP XP7 Business Copy Software Base LTU	TK913AA
	HP XP7 Business Copy Software 1TB 0-100TB LTU	TK913AB
	HP XP7 Business Copy Software 1TB 101-250TB LTU	TK913AC
	HP XP7 Business Copy Software 1TB 251-500TB LTU	TK913AD
	HP XP7 Business Copy Software 1TB Over 500TB LTU	TK913AE

### Product Highlights

- Real time local data mirroring
- Enables a wide range of data protection and recovery solutions
- Instant access to copied volumes
- New Fast Snap Copy-After-Write (CAW) Snapshots significantly improve P-VOL response times compared to legacy COW (Copy On Write) Snapshots
- Support for up to 1024 Snapshots per P-VOL with Fast Snap
- Host Agent integration using XP7 RAID Manager
- Includes licenses for Business Copy for Mainframe, providing local replication for mainframe volume types

### Support

- See Service & Support section

### Prerequisite

- **Software**
  - XP7 RAID Manager (required for host agent integration). RAID Manager is included in XP7 Array Manager.
  - Business Continuity Manager is required for z/OS host management of Business Copy for Mainframe
  - XP7 Thin Provisioning required for Fast Snap. XP7 Thin Provisioning is included in XP7 Array Manager Suite

### Licensing

- See Capacity-Licensed XP7 Software section. Licensing is based on the sum of all P-VOLs, S-VOLs (full copies) and POOL-VOL (Snapshot copies)

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## HPE XP7 Continuous Access Suite

### Overview

The HPE XP7 Continuous Access family of high availability data and disaster recovery tools enable

## Capacity-licensed XP7 Software

real-time data mirroring between XP7 Storage. They provide continuous availability for all your important data and protect you from catastrophic failures. XP7 Continuous Access products deliver host-independent, array-based remote recovery for a wide range of open systems environments. XP7 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, XP7 Continuous Access can be deployed for activities ranging from data migration to high-availability server clustering.

HPE XP7 Continuous Access Suite includes HPE XP7 Continuous Access Synchronous and HPE XP7 Continuous Access Journal. XP7 Continuous Access Synchronous, the base product, provides replication using a synchronous link between XP7 Storage. XP7 Continuous Access Journal provides replication using an asynchronous link between XP7 Storage. XP7 Continuous Access can be used to copy data between XP7 Storage and between XP Disk Arrays of different generations. For up to date information on XP7 Continuous Access compatibility between XP7/XP Disk Array generations, please contact your HPE representative.

### Models

#### XP7 Storage Continuous Access Suite LTUs

HP XP7 Continuous Access Suite Base LTU	TK911AA
HP XP7 Continuous Access Suite 1TB 0-100TB LTU	TK911AB
HP XP7 Continuous Access Suite 1TB 101-250TB LTU	TK911AC
HP XP7 Continuous Access Suite 1TB 251-500TB LTU	TK911AD
HP XP7 Continuous Access Suite 1TB Over 500TB LTU	TK911AE

### Product Highlights

- Remote data mirroring between XP7/XP Disk Arrays
- Enables a wide range of remote mirroring solutions
- XP7 Continuous Access Synchronous: Synchronous copy mode
- XP7 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 XP7 RAID Manager
- Supports 3DC Continuous Access Journal x Continuous Access Journal configuration
- XP7 Continuous Access Sync includes licenses for Continuous Access Synchronous for Mainframe, providing synchronous remote replication for mainframe volume types
- XP7 Continuous Access Journal includes licenses for Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe, and Cont Access Journal 3DC & 4x4 for Mainframe, providing asynchronous journal-based remote replication for mainframe volume types
- BCM is required for z/OS host management of CA Journal for MF, 3DC and Journal 4\*4 for Mainframe

### Support

- See Service & Support section

### Prerequisite

- Thin Provisioning is a requirement for Continuous Access Journal(Open and MF) for Journal volumes

### Licensing

- See Capacity-Licensed XP7 Software section

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## HPE XP7 Dynamic Link Manager Advanced

## Capacity-licensed XP7 Software

### Overview

HPE XP7 DLM Advanced for VMware, HPE XP7 DLM Advanced for IBM AIX, HPE XP7 DLM Advanced for Sun Solaris, HPE XP7 DLM Advanced for Windows, and HPE XP7 DLM Advanced for Linux are server-based software tools that provide I/O path failover and load balancing for your XP7s. 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.

### Models

Hitachi HGLM/HDLM for IBM AIX Media Kit	HIT5208A
HP XP7 Dynamic Link Manager Advanced for Windows LTU	TK918A
HP XP7 Dynamic Link Manager Advanced for Linux LTU	TK919A
HP XP7 Dynamic Link Manager Advanced for AIX 1 Server LTU	TK921A
HP XP7 Dynamic Link Manager Advanced for AIX Unlimited Server LTU	TK922A
HP XP7 Dynamic Link Manager Advanced for Solaris 1 Server LTU	TK923A
HP XP7 Dynamic Link Manager Advanced for Solaris Unlimited Server LTU	TK925A
HP XP7 Dynamic Link Manager Advanced for VMware 1 Server LTU	TK927A
HP XP7 Dynamic Link Manager Advanced for VMware Unlimited Server LTU	TK928A

### Product Highlights

- Supports wide range of operating systems - Supports path failover and load balancing for VMware, IBM AIX, Microsoft Windows, SUN Solaris, and Linux operating systems
- Offers fault-tolerant path management - manual or automatic failover and failback, automated path health checks, multiple active paths allowing bandwidth control at the HBA port level , dynamic LUN addition and deletion without a server reboot, easy installation and operation through auto-discovery function

### Support

- See Service & Support section

### Licensing

- HDLM Media Kit includes installers for all operating systems. However, installation services for each operating system must be purchased separately.
- For 1 Server LTU: License-to-use on a single server/XP7 Storage pair. Example: if you have two XP7 Storage and ten servers, all using Hitachi HDLM for IBM AIX, you would need 20 of the 1 Server LTUs.
- For Unlimited Server LTU: License-to-use with unlimited servers connected to a single XP7 Storage. Example: if you have two XP7 Storage and ten servers, all using Hitachi HDLM for IBM AIX, you would need two of the Unlimited Server LTUs.
- If a server has multiple partitions, a copy of HDLM is required for every partition that will be using HDLM. For example, if you have a server with 2 partitions and both partitions require HDLM, then you would need two of the 1 Server LTUs or one Unlimited Server LTU.

## HPE XP7 Global Link Manager

### Overview

HPE XP7 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, XP7 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.

## Capacity-licensed XP7 Software

<b>Models</b>	HP XP7 Global Link Manager 1 Server LTU	TK907A
	HP XP7 Global Link Manager Unlimited Server LTU	TK917A
<b>Support</b>	<ul style="list-style-type: none"> <li>• See Service &amp; Support section</li> </ul>	
<b>Licensing</b>	<ul style="list-style-type: none"> <li>• For 1 Server LTU: The number of HDLM instances/servers that HGLM has under management</li> <li>• For Unlimited Server LTU: 1 HGLM unlimited license allows users to register and manage unlimited number of HDLM instances/servers on 1 platform connected to 1 DKC</li> </ul>	

## HPE Serviceguard Metrocluster with XP7 and XP Continuous Access and HPE Serviceguard for Linux x86 Enterprise edition

### Overview

HPE Serviceguard Metrocluster with XP7 and XP Continuous Access seamlessly integrates XP7 Storage remote replication capabilities with HPE Serviceguard for HPE-UX and Linux. It provides automatic and bi-directional failover/failback of business critical data and applications between data centers. HPE Metrocluster with XP7 and XP Continuous Access supports XP7 Storage in a two Data Center configuration.

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

When combined with the HPE Continental clusters product, HPE Serviceguard Metrocluster with XP7 and XP Continuous Access or HPE Serviceguard for Linux x86 Enterprise edition can also be used to replicate data and to perform application recovery across three data centers using the following storage devices: XP7, XP P9500, XP24000, XP20000, XP12000, and XP10000.

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

For more information, please refer to: <http://www.hpe.com/go/dt> or <http://www.hpe.com/go/sglx>

### Models

HP MetroCluster with Continuous Access XP LTU	B8109CA
HP Serviceguard for Linux x86 1y 24x7 Enterprise PSL Flexible LTU	BB097AC
HP Serviceguard for Linux x86 1y 24x7 Enterprise PSL E-LTU	BB097ACE
HP Serviceguard for Linux x86 Enterprise DVD Media	BB097AA
HP Serviceguard for Linux Enterprise Trade-in	BB097ACN

### Product Highlights

- Extends protection provided by a Serviceguard cluster to cover disasters that affect the whole data center.
- Functions as an automatic failover/failback disaster recovery solution for HPE Serviceguard for HPE-UX and Linux.
- When combined with the HPE Continental clusters product, provides the ability to replicate data across three data centers (with XP7, P9500, XP24000, XP20000, XP12000 and XP10000 Disk Arrays) resulting in minimal Recovery Point Objective (RPO) / Recovery Time Objective (RTO). This configuration provides protection against widespread disasters that may affect an entire region.

## Capacity-licensed XP7 Software

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

**Prerequisites**

**Software**

- HPE-UX 11i v1 or higher. The 3 Data Center capability is available only on HPE-UX 11i v2 or higher.
- RHEL 5 or 6, SUSE 11 (SP2 or higher)
- HPE Serviceguard
- XP7 Continuous Access (XP7 Continuous Access Sync, or XP7 Continuous Access Journal)
- XP7 RAID Manage

**Licensing**

- One license needed for every clustered environment

## HPE Serviceguard Continentalclusters

**Overview**

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

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

Applications can be configured in Continentalclusters for disaster tolerance using HPE XP7 Storage and HPE XP7 Continuous Access data replication technology.

For more information, please refer to: <http://www.hpe.com/go/dt> or <http://www.hpe.com/go/sglx>.

**Models**

HP Continental Clusters LTU	T2346BA
HP Continentalcluster for Linux x86 1y 24x7 PSL Flexible LTU	BB100AC
HP Continentalcluster for Linux x86 1y 24x7 PSL Flexible E-LTU	BB100ACE
<b>NOTE: Either of the above LTUs is required.</b>	
HP Serviceguard for Linux Continentalclusters x86 PSL LTU Trade-in	BB100ACN
HP Serviceguard Continentalclusters for Linux Media Kit	BB086AA

**Product Highlights**

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

## Capacity-licensed XP7 Software

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

**Prerequisites**

**Software**

- HPE-UX 11i v1 or higher, RHEL 5 or 6, SUSE 11 (SP2 onwards) (For more information, please refer to: <http://docs.hpe.com>)
- HPE Serviceguard (11.20)
- HPE Metrocluster with XP7 Continuous Access

**Licensing**

- One license of Serviceguard Continentalclusters covers two pairs of clusters (Primary and Recovery). Use Option 888 (designed for use with HPE Metrocluster with XP7 Continuous Access).
- Each license of Serviceguard Continentalclusters requires one license of HPE Metrocluster with XP7 Continuous Access.
- When purchasing HPE Serviceguard for Linux, appropriate number of Licenses to Use (LTU) must be ordered and a copy of the Software must be ordered separately. The Software copy can be ordered by e-Delivery or by Physical Media (DVD).
- One License to Use (LTU) must be ordered for each active socket running HPE Serviceguard for Linux software. This new Per Socket License (PSL) is offered, replacing System-wide licenses and Per Core Licenses (PCL).

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## HPE XP Cluster Extension Software

**Overview**

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

For more information, please refer to: <http://www.hpe.com/go/clx>

**Models**

HP P9000 Cluster Extension Software Windows LTU	TB534A
HP XP P9000 Cluster Extension Windows Array LTU	BC886B

**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**

- XP7 Continuous Access Synchronous (required for synchronous copy mode-integrated solution)
- XP7 Continuous Access Journal (required for asynchronous copy mode-integrated solution)

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## Capacity-licensed XP7 Software

- XP7 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.

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## HPE XP7 Virtualization Adapter

### Overview

HPE XP7 Virtualization Adapter (XP7 Virtualization Adapter) provides an interface between VMware Site Recovery Manager (SRM) and HPE XP7 Storage. The interface enables SRM to provide automatic access to remote data copies when virtual machines become unavailable locally.

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

For additional information, please visit [hpe.com](http://www.hpe.com) at the following URL:

**<http://www.hpe.com/go/storage/vmware>**

### Product Highlights

HPE XP7 Virtualization Adapter performs the following functions for SRM:

- Discovers disk arrays
- Discovers replicated LUNs
- Fails over storage for testing (test a recovery plan)
- Fails over storage for recovery (execute a recovery plan)

### Prerequisites

- Servers with VMware Site Recovery Manager
- XP7 Continuous Access Synch and/or XP7 Continuous Access Journal installed on both the local and remote XP7 Storage
- RAID Manager 1.24.13 or later (to support XP7 Storage)

Optional: XP7 Business Copy installed on both the local and the remote XP7 Storage

### Licensing

- The XP7 Virtualization Adapter is provided as a free download. Visit: **<http://www.hpe.com/go/storage/vmware>**

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## HPE DBUtil

### Overview

HPE DBUtil is a command-line utility to facilitate application-consistent replication of a Microsoft SQL Server database. HPE DBUtil commands place the database in a transnationally consistent state and suspend write operations while HPE replication software is used to copy the database. Other HPE DBUtil commands then resume the database and normal write operations. HPE DBUtil now supports Microsoft SQL Server 2008 and Microsoft Windows Server 2008 operating system.

HPE DBUtil can be downloaded at no charge from the following site:

**[http://h20000.www2.hpe.com/bizsupport/TechSupport/SoftwareDescription.jsp?lang=en&cc=us&swItem=co-62583-1&jumpid=reg\\_R1002\\_USEN](http://h20000.www2.hpe.com/bizsupport/TechSupport/SoftwareDescription.jsp?lang=en&cc=us&swItem=co-62583-1&jumpid=reg_R1002_USEN)**

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## HPE XP7 Smart Manager for Mainframe

### Overview

HPE XP7 Smart Manager for Mainframe provides centralized management of Smart Tiers volumes in a mainframe environment. It works together with Smart Tiers to help mainframe users conveniently and



## Capacity-licensed XP7 Software

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.

<b>Models</b>	HP XP7 Smart Manager for Mainframe Base LTU	TK906AA
	HP XP7 Smart Manager for Mainframe 1TB 0-100TB LTU	TK906AB
	HP XP7 Smart Manager for Mainframe 1TB 101-250TB LTU	TK906AC
	HP XP7 Smart Manager for Mainframe 1TB 251-500TB LTU	TK906AD
	HP XP7 Smart Manager for Mainframe 1TB Over 500TB LTU	TK906AE
<b>Product Highlights</b>	<ul style="list-style-type: none"> <li>• Smart Tiers management of z/OS for mainframe volumes.</li> <li>• Recognizes z/OS DASD based on VOLSER, Storage Group and z/OS device numbers.</li> <li>• Transparent migration - no need to disrupt or quiesce applications</li> </ul>	
<b>Support</b>	<ul style="list-style-type: none"> <li>• See Service &amp; Support section</li> </ul>	
<b>Prerequisites</b>	<ul style="list-style-type: none"> <li>• <b>Software</b> <ul style="list-style-type: none"> <li>- HPE XP7 Thin Provisioning</li> <li>- HPE XP7 Smart Tiers</li> </ul> </li> <li>• <b>Operating System</b> <ul style="list-style-type: none"> <li>- IBM z/OS (required)</li> </ul> </li> </ul>	
<b>Licensing</b>	<ul style="list-style-type: none"> <li>• Smart Manager for MF is licensed by used capacity for XP7 Storage. See licensing section for more details</li> </ul>	

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## HPE XP7 for Data Exchange

<b>Overview</b>	HPE XP7 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.	
<b>Models</b>	HP XP7 Data Exchange Software LTU	TK920AE
<b>Product Highlights</b>	<ul style="list-style-type: none"> <li>• Mainframe and open systems data managed and stored on single XP7 Storage</li> <li>• Automatic data format and code conversions</li> <li>• Supports HPE UX, Windows, Linux, Sun Solaris, and AIX Operating Systems</li> </ul>	
<b>Support</b>	<ul style="list-style-type: none"> <li>• See Service &amp; Support section</li> </ul>	
<b>Licensing</b>	<ul style="list-style-type: none"> <li>• License-to-use on a per server basis (per server connected to one XP7 Storage). One License required for each server running XP7 for Data Exchange Software.</li> </ul>	

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## HPE XP7 for Compatible Extended Remote Copy (XRC)

<b>Overview</b>	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.	
<b>Models</b>	HP XP7 Extended Remote Copy Software Base LTU	TK938AA
	HP XP7 Extended Remote Copy Software 1TB 0-100TB LTU	TK938AB

## Capacity-licensed XP7 Software

HP XP7 Extended Remote Copy Software 1TB 101-250TB LTU	TK938AC
HP XP7 Extended Remote Copy Software 1TB 251-500TB LTU	TK938AD
HP XP7 Extended Remote Copy Software 1TB Over 500TB LTU	TK938AE

### Support

- See Service & Support section

### Licensing

- Licensing on one XP7 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 XP7 Software section

## HPE XP7 FlashCopy Mirroring

### Overview

HPE XP7 for 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 XP7 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 XP7 for Compatible Extended Remote Copy.

**FlashCopy Space Efficient** - Storage space required by copies can be saved with FlashCopy Space Efficient. FlashCopy SE uses space based on actual data being copied, not based on the P-VOL size, thus reducing the physical size required for T-VOLs. Only volumes can be FlashCopy'ed with Space Efficient FlashCopy.

### Models

HP XP7 FlashCopy Mirroring Software Base LTU	TK940AA
HP XP7 FlashCopy Mirroring Software 1TB 0-100TB LTU	TK940AB
HP XP7 FlashCopy Mirroring Software 1TB 101-250TB LTU	TK940AC
HP XP7 FlashCopy Mirroring Software 1TB 251-500TB LTU	TK940AD
HP XP7 FlashCopy Mirroring Software 1TB Over 500TB LTU	TK940AE
HP XP7 FlashCopy Space Efficient Software Base LTU	TK941AA
HP XP7 FlashCopy Space Efficient Software 1TB 0-100TB LTU	TK941AB
HP XP7 FlashCopy Space Efficient Software 1TB 101-250TB LTU	TK941AC
HP XP7 FlashCopy Space Efficient Software 1TB 251-500TB LTU	TK941AD
HP XP7 FlashCopy Space Efficient Software 1TB Over 500TB LTU	TK941AE

### Support

- See Service & Support section

### Prerequisite

- Thin Provisioning is a requirement for Space efficient Flash Copy

### Licensing

- See Capacity-Licensed XP7 Software section. Thin Provisioning for Mainframe is a prerequisite for FlashCopy Space Efficient.

## HPE XP7 Business Continuity Manager

## Capacity-licensed XP7 Software

### Overview

HPE XP7 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.

XP7 Business Continuity Manager includes Business Continuity Manager Extended CT Group functionality, allowing you to maintain data consistency within and across multiple XP7 Storage for Continuous Access Synchronous for Mainframe operations.

### Models

HP XP7 Business Continuity Manager Server LTU	TK953A
HP XP7 Business Continuity Manager Software Base LTU	TK954AA
HP XP7 Business Continuity Manager Software 1TB 0-100TB LTU	TK954AB
HP XP7 Business Continuity Manager Software 1TB 101-250TB LTU	TK954AC
HP XP7 Business Continuity Manager Software 1TB 251-500TB LTU	TK954AD
HP XP7 Business Continuity Manager Software 1TB Over 500TB LTU	TK954AE

### Support

- See Service & Support section

### Prerequisite

- Operating System
  - IBM z/OS (required)

**NOTE: Business Continuity Manager is only supported in z/OS environments. Other mainframe environments, like IBM z/VM, IBM z/VSE, and non-IBM operating systems are not supported.**

### Licensing

- One TK953A Server LTU for each server connected to a XP7 or XP Disk Array controlled by Business Continuity Manager.
- For XP7 Storage: TK954AA/AB/AC/AD/AE licensed on one XP7 or XP P9500 Disk Array, based on total capacity of the P-VOLs associated with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe. S-VOLs are not included in the total. For multiple arrays managed under the same Business Continuity Manager, sum all of the Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe P-VOLs for all of the arrays and purchase the licenses based on the overall total (unlike other XP7 software licenses which are licensed per array). See Capacity-Licensed XP7 Software section.

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## HPE XP7 Business Continuity Manager Continuous Access Journal 4x4 Ext CTG

### Overview

HPE XP7 Business Continuity Manager Continuous Access Journal 4x4 Ext CTG Software allows the user to maintain data consistency within and across multiple (up to four) XP7 Storage for Continuous Access Journal for Mainframe operations.

### Models

HP XP7 Business Continuity Mgr Continuous Access Journal 4x4 Ext Consistency Group Base LTU	TK956AA
HP XP7 Business Continuity Mgr Continuous Access Journal 4x4 Ext Consistency Group 1TB 0-100TB LTU	TK956AB
HP XP7 Business Continuity Mgr Continuous Access Journal 4x4 Ext Consistency Group 1TB 101-250TB LTU	TK956AC
HP XP7 Business Continuity Mgr Continuous Access Journal 4x4 Ext Consistency Group 1TB 251-500TB LTU	TK956AD
HP XP7 Business Continuity Mgr Continuous Access Journ 4x4 Ext Consistency Group 1TB Over 500TB LTU	TK956AE

## Capacity-licensed XP7 Software

<b>Support</b>	<ul style="list-style-type: none"> <li>See Service &amp; Support section</li> </ul>
<b>Prerequisite</b>	<ul style="list-style-type: none"> <li><b>Software</b> <ul style="list-style-type: none"> <li>HPE XP7 for Business Continuity Manager (required)</li> <li>Continuous Access Journal for Mainframe (required - included with XP7 HPE Continuous Access Suite)</li> </ul> </li> </ul>
<b>Licensing</b>	<ul style="list-style-type: none"> <li>For XP7 Storage: TK956AA/AB/AC/AD/AE licensed on one XP7, based on total capacity of the P-VOLs associated with Continuous Access Journal for Mainframe. For multiple arrays managed under the same Business Continuity Manager, sum all of the Continuous Access Journal for Mainframe P-VOLs for all of the arrays and purchase the licenses based on the overall total (unlike other XP7 software licenses that are licensed per array). See Capacity-Licensed XP7 Software section.</li> </ul>

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## HPE XP7 High Performance FICON(R) Connectivity Software

<b>Overview</b>	High Performance FICON for system z or zHPF is an enhancement of the FICON channel architecture; which also means compatibility with certain standards such as Fibre Channel Physical and Signaling standard (FC-FS), Fibre Channel Switch Fabric and Switch Control Requirements (FC-SW), and Fibre Channel Single-Byte-4 (FC-SB-4) standards. Enhancements have been made to the z/Architecture® and the FICON interface architecture to deliver improvements for online transaction processing (OLTP) workloads. zHPF is implemented exclusively in System z10. When High Performance FICON is exploited by the FICON channel, the z/OS operating system, and the control unit; the FICON channel overhead will be reduced. This is achieved by simplification of the protocol, and by reducing the number of information units processed, resulting in more efficient use of the fiber link.	
<b>Models</b>	HPE XP7 High Performance FICON (R) Connectivity Software LTU	TK937A
	Also bundled with XP7 Mainframe Performance Suite	
<b>Support</b>	See Service & Support section	
<b>Licensing</b>	The standalone license is a frame license XP7 Mainframe Performance Suite bundle is licensed by used capacity.	

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## Capacity-licensed XP7 Software

Many XP7 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. The capacity-licensed XP7 Software products are licensed using a "band" structure.

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## Band-based Capacity-licensed XP7 Software Product Structure

Band-based capacity-licensed XP7 Software licenses are ordered in 1TB increments only, with different 1TB license types corresponding to each of the capacity "band" product numbers of the software product structure:

<b>Description</b>	<b>Product Number</b>
Base License	TK9xxAA
1TB increment, 0TB to 100TB	TK9xxAB
1TB increment, 101TB to 250TB	TK9xxAC
1TB increment, 251TB to 500TB	TK9xxAD

## Capacity-licensed XP7 Software

1TB increment, Over 500TB

TK9xxAE

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 XP7 Storage or for a new software purchase for an existing XP7 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.

**NOTE:** Because of the band pricing structure, if your configuration is near the top of a band, compare the price of the entry point of the next higher band to see if it might provide a lower price. For example, consider 100TB of XP7 Array Manager. 100TB is at the top of the first band. If you move up to the next band and buy 101TB instead, you will find that the price for 101TB is actually lower than the price for 100TB.

### For new software purchase:

Purchase the Base License and then purchase all capacity licenses from the capacity band that matches the total capacity required.

Example: Customer purchases an 18TB raw capacity XP7 Storage. Consider that total usable capacity, based on the capacity of all configured LDEVs, is 12TB. Customer wants HPE XP7 Auto LUN. In this case, customer will need to purchase 12TB of Auto LUN LTUs. To provide for 12TB license capacity for the software, the customer would order the following:

Quantity	Description	Product Number
1	HP XP7 Auto LUN Software Base LTU	TK915AA
12	HP XP7 Auto LUN Software 1TB 0-100TB LTU	TK915AB

### For license capacity upgrades:

The customer purchases additional license product from the band that matches the sum of the currently installed capacity plus the desired upgrade capacity.

Example: Customer has a 96.5TB usable capacity system with existing 97TB installed license capacity of XP7 Auto LUN. They then install more drives and configure 4 TB additional usable capacity (bringing the total usable storage capacity of the array up to 100.5 TB). In this case, the customer requires at least 3.5 TB (100.5 TB - 97 TB) additional license capacity of XP7 Auto LUN in order to "cover" the new total usable capacity of the array. Rounding 3.5 TB up to the nearest TB, they customer needs to purchase 4 TB license capacity for a total of 101 TB. Because the total capacity is 101 TB, the upgrade capacity is purchased from the 101 to 250 TB band

Quantity	Description	Product Number
4	HP XP7 Auto LUN Software 1TB 101-250TB LTU	TK915AC

## Usable Capacity-licensed Software Titles

For usable capacity-licensed titles, customers license the use of the software by purchasing License products that "cover" them for the amount of total usable storage capacity present on their array (i.e. for the total capacity of all the LDEVs configured in the array). In other words, usable capacity is based upon the total usable capacity of all created LDEVs

Total Usable Capacity = Allocated LDEVs + Unallocated LDEVs + Reserved Capacity. Note that Usable Capacity for software

## Capacity-licensed XP7 Software

licenses is to be calculated in binary (TiB). A factor of 1024 is to be used for converting from raw to usable capacity. Example: Customer has a XP7 Storage with 100TB physical raw capacity. The entire raw capacity has been configured as RAID 1. Thus, the total effective capacity available to customer is 50TB. Customer configures a number of LDEVs whose total capacity equals 40TB. This 40TB will be considered as the "usable" capacity of the array. All software titles licensed on usable capacity will need to have 40TB licenses if they need to be used on this array.

Note that if a customer crosses the boundary by creating too many LDEV's, they can restore management to the array by deleting LDEVs until they are back below the licensed threshold again. It is not necessary to de-install array groups to correct exceeding the licensed capacity.

The following XP7 Family Software Titles are licensed based on the (internal + external) usable storage capacity of the array:

- HPE XP7 Command View AE
- HPE XP7 Tiered Storage Manager
- HPE XP7 Array Manager
- HPE XP7 Auto LUN
- HPE XP7 Performance Advisor
- HPE XP7 Mainframe Basic Suite

For these titles, customers license the use of the software by purchasing License products that "cover" them for the amount of usable storage capacity present on their array (i.e. for the total capacity of all the configured LDEVs in the array excluding spare drives).

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## Used Capacity-licensed Software Titles

The following XP7 Family Software Titles are licensed based on the amount of storage actually employed by the Software:

- HPE XP7 Smart Tiers (licensed on the capacity of the thin provisioning pool that is managed by Smart Tiers)
- HPE XP7 Continuous Access Suite (includes Continuous Access Journal and Continuous Access Synchronous)
  - Used capacity = Open Systems P-Vols and S-Vols plus Mainframe P-Vols and S-Vols.
  - Only P-Vols and S-Vols are counted when determining license quantity. Capacity used for journal volumes is not counted.
- HPE XP7 Business Copy (includes Fast Snap and Business Copy for Mainframe)
  - Used capacity = Business Copy P-Vols and S-Vols, plus Business Copy for Mainframe P-Vols and S-Vols, plus Snapshot P-Vols and Pool-Vols.
- Business Copy for Mainframe
- HPE XP7 Mainframe Performance Suite (includes Compatible Parallel Access Volumes (PAV) - licensed on total used mainframe LDEV capacity. This is the sum of total capacity of mainframe base LDEVs (data volumes) that will be defined with ALIASES via the Remote Web Console at the time PAV is installed, and base volumes that are accessed by Hyper PAV (if HyperPAV is installed).
- HPE XP7 Mainframe Tiering Suite (includes Smart Tiers and Smart Manager for Mainframe)
- HPE XP7 for FlashCopy Mirroring
- HPE XP7 for FlashCopy Space Efficient
- HPE XP7 for Compatible Extended Remote Copy (XRC) (total capacity of XRC P-VOLs. Also, add the total capacity of XRC S-VOLs if reverse copy will be used for recovery operations.)
- HPE XP7 for Business Continuity Manager (total capacity of the P-VOLs associated with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe for all XP7 Disk Arrays managed under the same Business Continuity Manager)
- Hitachi Business Continuity Manager Extended CT Group (total capacity of the P-VOLs associated with Continuous Access Synchronous for Mainframe for all of the arrays managed under the same Business Continuity Manager)
- HPE XP7 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG (total capacity of the P-VOLs

## Capacity-licensed XP7 Software

associated with Continuous Access Journal for Mainframe for all of the arrays managed under the same Business Continuity Manager.

For these titles, customers license the use of the software by purchasing License products that "cover" them for the amount of storage capacity actually used by the software title in question.

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**For HPE XP7 Continuous Access Suite, and** Used capacity is defined as the total capacity of all logical volumes that are Remote Mirroring P-Vols (source volumes on a primary XP7 Storage) or S-Vols (copy volumes on a secondary XP7 Storage). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e. the amount excludes RAID mirroring overhead).

**Continuous Access Synchronous for Mainframe, and** **Example:** Based upon their total storage need, a customer requires a primary XP7 Storage with 5TB raw capacity. The customer also requires XP7 Continuous Access for the purpose of deploying a disaster recovery solution. For their solution, they determine that they will mirror 70 LUNs of equal LDEV size to a secondary XP7 Storage in their remote data center. Each LUN LDEV is roughly 14.5 GB in size. Each source LUN is a P-Vol and each copy LUN is an S-Vol. On both the primary and secondary, the customer must purchase license capacity to cover all LUNs being managed as XP7 Continuous Access P-Vols plus S-Vols. In this case, the total used capacity would be calculated as follows:

**Continuous Access Journal for Mainframe:**

- On the Primary array: Used Capacity = P-Vol (source) LUNs =  $70 \times 14.5\text{-GB} = 1,015\text{ GB}$ . Dividing by 1024 to convert to TB gives 0.99 TB. Rounded up to the next highest TB: 1 TB total used capacity
- On the Secondary array: Used Capacity = S-Vol (copy) LUNs =  $70 \times 14.5\text{-GB} = 1,015\text{ GB}$ . Dividing by 1024 to convert to TB gives 0.99 TB. Rounded up to the next highest TB: 1 TB total used capacity

Therefore, for the primary and secondary XP7s, the customer must purchase at least 1 TB worth of license capacity on each array.

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**For HPE XP7 Business Copy and** Used capacity is defined as the total capacity of all logical volumes that are either Local Copy P-Vols (BC source) or traditional S-Vols (BC copy) or POOL-Vols (where Snapshot data is stored). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e. it excludes RAID mirroring overhead).

**Business Copy for Mainframe**

**Example:** Based upon their total storage need, a customer requires a 5 TB raw capacity XP7 Storage. The customer also requires XP7 Business Copy for the purpose of online backup and application testing and all of the copy LUNs will be traditional, full-size volumes. For their solution, they determine that they will mirror 70 LUNs of equal LDEV size, with one copy each for the first 30 LUNs and two copies each for the other 40 LUNs. Each LUN LDEV is roughly 14.5 GB in size. Each source LUN is a P-Vol and each copy LUN is an S-Vol. The customer must purchase license capacity to cover all LUNs being managed as a XP7 Business Copy P-Vol or S-Vol. In this case, the total used capacity would be calculated as follows:

- Used Capacity = P-Vol (source) LUNs + S-Vols (copy) LUNs =  $70 \times 14.5\text{-GB} + 1 \times 30 \times 14.5\text{-GB} + 2 \times 40 \times 14.5\text{-GB} = 1,015\text{ GB} + 1,595\text{ GB} = 2,610\text{ GB}$ . Dividing by 1024 to convert to TB gives 2.55 TB. Rounded to the next highest TB: 3 TB used capacity.

### For HPE XP7 Business Copy using Fast Snap replication

Used capacity is defined as the total capacity of all logical volumes that are P-Vols (Fast Snap source)

## Capacity-licensed XP7 Software

plus Pool Volume (where all Copy-after-Write data is stored). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e., it excludes RAID mirroring overhead).

The Pool Volume size is estimated by understanding:

1. the size of data that will be changed for each P-Vol per generation of Snapshot V-Vol (X)
2. the number of generations of Snapshots that will be created/retained (Y)
3. the number of P-Vols that will have Snapshots taken (Z)

The Pool volume size =  $X \times Y \times Z$  (rounded up to the next TB)

**Example:** Based on a customer's total storage need, they have 300 P-Vols, each sized at 100GB (30,000GB, dividing by 1024 to convert to TB gives 29.3 TB, rounded to the next highest TB: 30TB total). The customer wants to keep 7 generations of Snapshot V-Vols. Finally, it has been estimated that 4.7GB of data will be updated between each generation. The customer must purchase license capacity to cover all LUNs being managed as a Snapshot XP7 P-Vol or V-Vol. In this case, the total used capacity would be calculated as follows:

- Used Capacity = P-Vol (source) LUNs + Pool volume size = 30TB + (4.7GBx7x300 = 9,870GB, dividing by 1024 to convert to TB gives 9.64 TB, rounded to the next highest TB: 10TB) for a total licensing requirement of 40TB

Fast Snap requires a V-Vol management area in Shared Memory. The Shared Memory requirement for the V-Vol management area is the sum of the P-Vol information capacity requirement + the Pool Volume information capacity requirement. See the Fast Snap Users Guide for complete details regarding configuring Shared Memory for Fast Snap.

Shared Memory requirement for XP7 Storage - refer to the configuration guide to understand the Shared Memory requirements for XP7 Storage.

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**For Mainframe Software bundling with Open Systems Software:** The following mainframe local and remote mirroring software titles are bundled with their open systems equivalents when ordered for the XP7 Storage:

- Continuous Access Synchronous for Mainframe (included with HPE XP7 Continuous Access Synchronous)
- Continuous Access Journal for Mainframe (included with HPE XP7 Continuous Access Journal)
- Business Copy for Mainframe (included with HPE XP7 Business Copy)

For these products, customer must purchase license capacity to cover the total open systems and mainframe used capacity.

**Example:** A customer has a XP7 Storage with mainframe and open systems connect. They want to use HPE XP7 Continuous Access to synchronously mirror 2 TB of open systems volumes and Continuous Access Synchronous for Mainframe to mirror 1 TB of mainframe volumes to another XP7 Storage. For each array, this customer requires at least 3 TB of license capacity of HPE XP7 Continuous Access (which includes Continuous Access Synchronous for Mainframe).

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## Summary of Changes

Date	Version History	Action	Description of Change:
11-Dec-2015	From Version 10 to 11	Changed	Changes made to the Overview Section
01-Dec-2015	From Version 9 to 10	Changed	Changes were made throughout the QuickSpecs
28-Sept-2015	From Version 8 to 9	Changed	Changes made to the Standard Features, Technical Specifications and Capacity-Licensed Sections.
17-Aug-2015	From Version 7 to 8	Changed	Changes were made throughout the QuickSpecs
05-Jun-2015	From Version 6 to 7	Changed	Changes made to the Capacity-Licensed XP7 SW Section.
01-Jun-2015	From Version 5 to 6	Changed	Added the HPE XP7 Three Data Center High Availability Suite
30-Mar-2015	From Version 4 to 5	Changed	Changes made to the Technical Specifications and Capacity Licensed Sections. SKUs descriptions were updated.
05-Dec-2014	From version 3 to 4	Removed	Removed the XP7 Migration Software references.
29-Sep-2014	From Version 2 to 3	Changed	Changes were made throughout the QuickSpecs
18-Aug-2014	From Version 1 to 2	Changed	Changes made to the Overview, Technical Specifications and the Capacity-Licensed XP7 Software Sections  Product Descriptions Updated



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

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