

# HP StorageWorks

## XP24000/XP20000 Disk/Cache Partition User's Guide



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## Revision History

<b>Edition</b>	<b>Date</b>	<b>Description</b>
Fifth	December 2008	This edition applies to microcode version 60-04-04-00/00 or later.
Sixth	June 2009	This edition applies to microcode version 60-05-00-00/00 or later.
Seventh	August 2009	This edition applies to microcode version 60-05-00-00/00 or later.

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# 1 Overview of HP StorageWorks XP Disk/Cache Partition Software

This chapter provides an introduction to *XP Disk/Cache Partition Software*.

- [Introduction to Disk/Cache Partition](#), page 7
- [Benefits of Disk/Cache Partition](#), page 8
- [Feature Highlights](#), page 8

Unless otherwise specified, the term storage system in this guide refers to the following disk arrays:

- HP StorageWorks XP24000 Disk Array
- HP StorageWorks XP20000 Disk Array

The GUI illustrations in this guide were created using a Windows computer with the Internet Explorer browser. Actual windows may differ depending on the operating system and browser used. GUI contents also vary with licensed program products, storage system models, and firmware versions.

## Introduction to Disk/Cache Partition

XP Disk/Cache Partition provides logical partitioning of ports, cache, and disk capacity, including external storage to create independently managed and secure private virtual storage machines that help maintain quality of service (QoS).

Large data centers typically support a high volume of users, systems, and applications—each with constantly changing requirements for storage capacity, throughput, priority, security and access, as well as management and control. Traditionally, isolated storage systems could be dedicated to specific applications, but only at the cost of flexibility and ease of management. With decentralized access and control, however, departments can manage their storage systems individually.

HP storage—specifically the XP24000 Disk Array and XP20000 Disk Array (herein after referred to as storage system) – addresses these issues by enabling consolidation, aggregation, and management of large sets of diverse, highly dynamic stored data. By virtualizing storage resources into a single pool, the storage system facilitates flexibility and manageability for IT administrators.

XP Disk/Cache Partition is designed to complement the storage system by allowing IT departments to isolate, segment, and control storage for specific applications, servers, or users. This tool enables data center administrators to perform logical partitioning of ports, cache, and disk capacity, including external storage, on the storage system to create independently managed private virtual storage machines. These logical partitions act as dedicated storage resources that are independently managed and reserved for specific applications.

XP Disk/Cache Partition enables administrators to treat logical partitions as if they were separate storage machines, helping them maintain data security and integrity. The software also allows administrators to grant decentralized access and control of specific partitions to departmental IT managers—a feature that can enhance manageability and free data center administrators to focus on corporate-level projects. By dedicating resources to each partition as needed, administrators also can maintain high QoS for all users. Resources can be allocated based on business requirements and dynamically reconfigured in real time to meet changing needs. Customers can use XP Disk/Cache

Partition to create up to 32 private virtual storage machines on the storage system. With the ability to manage each partition as its own storage system, IT managers can operate storage in an utility like fashion, negotiating and providing different QoS by application and charging back business units for storage usage.

## Benefits of Disk/Cache Partition

### Improves Security

XP Disk/Cache Partition restricts access to data and resources from users and storage administrators without authorization to that partition. It also restricts access from users and administrators to data and resources outside their authorized partition.

### Assures Quality of Service

XP Disk/Cache Partition dedicates resources (for example, cache, disk) for exclusive use by specific applications to maintain priority and QoS for business-critical applications. You can secure and/or restrict access to storage resources to ensure confidentiality for specific applications. You can also use XP Disk/Cache Partition to adjust data storage resources dynamically to satisfy changing business requirements.

### Enables Departmental View of Storage

A Departmental view of storage delivers accountability and chargeback, facilitates departmental management and control within partitions, and permits centralized control over departments.

## Feature Highlights

XP Disk/Cache Partition logically partitions a virtualized storage pool on the storage system, consisting of internal and externally attached storage resources (regardless of physical location), into multiple independently managed storage machines. It allows you to allocate storage resources to specific applications. You can partition and isolate storage from access by users, applications, and administrators of other partitions.

XP Disk/Cache Partition reconfigures partitions dynamically, in real time, without disruption of service. It allows allocation of platform software licenses for use by partition administrators.



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## 2 About Disk/Cache Partition

This chapter provides a detailed description of Storage Logical Partition (SLPR) and Cache Logical Partition (CLPR).

- [Storage Logical Partition \(SLPR\)](#), page 9
- [Cache Logical Partition \(CLPR\)](#), page 10

The storage systems can connect multiple hosts, and can be shared by multiple users, such as different departments or even different companies. This can cause conflicts among the various users. For example, if a particular host issues a lot of I/O requests, the I/O performance of other hosts may decrease. If the various administrators have different storage policies and procedures, or issue conflicting commands, that can cause management conflicts.

XP Disk/Cache Partition has two main functions: storage logical partition (SLPR), and Cache Logical Partition (CLPR). Storage Logical Partition allows you to divide the available storage among various users, to lessen conflicts over usage. Cache Logical Partition allows you to divide the cache into multiple virtual cache memories, to reduce cache contention.

Initially, SLPR 0 is the pool of all ports and CLPRs in the storage system. SLPR 0 contains CLPR 0, the initial pool of all cache and parity groups in the storage system. When another SLPR is created, the required resources are reassigned from SLPR 0 to the new SLPR. The only users who have access to SLPR 0 and CLPR 0 are storage administrators.

### Storage Logical Partition (SLPR)

A storage system can be shared among several groups that may have different storage administrators. This can cause problems if those administrators have differing or conflicting storage procedures, or if two or more administrators attempt to perform operations on the same logical volume, such as LUN Expansion (LUSE) or Virtual LVI/LUN (VLL). The storage logical partition function can allocate the storage system resources into two or more virtual storage systems, each of which can be accessed only by the storage administrator, the storage partition administrator for that storage logical partition, and the users for that partition. You can create up to 32 storage logical partitions in one storage system, including the default SLPR 0. There is no maximum or minimum size for an SLPR. See [“Creating a Storage Logical Partition”](#) on page 29 for instructions on creating storage logical partitions.

[Figure 1](#) illustrates a storage system that is divided into two virtual partitions, so that the storage administrator of each storage logical partition can only access that partition.

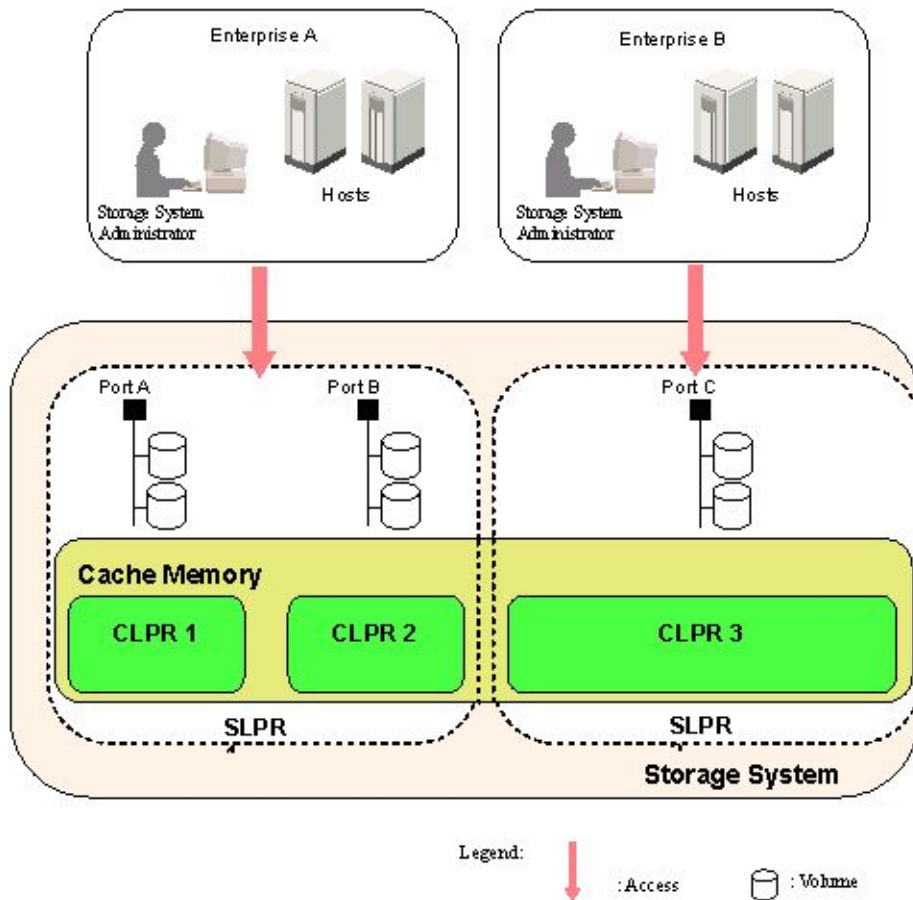


Figure 1 Storage Logical Partition (SLPR)

## Cache Logical Partition (CLPR)

If one storage system is shared with multiple hosts, and one host reads or writes a large amount of data, read and write data can require enough of the cache memory to affect other users. The cache logical partition function creates two or more virtual cache memories, with each allocated to a different host. This prevents contention for cache memory. Parity groups containing LDEVs that belong to the optional LDKC can be allocated to a CLPR.

To add cache memory to the storage system, use the Standard Cache Access Model mode or the High Performance Cache Access Model mode. If your storage system has any additional printed circuit boards (PCBs), you must install the cache memory with the High Performance Cache Access Model mode. If you want to use Cache Residency Manager, you can set up the required cache area in one or more CLPRs. For more information on Cache Residency Manager, see the *HP StorageWorks XP24000/XP20000 Cache Residency Manager User's Guide*. For more information about additional cache memories, call HP technical support (see “[Creating a Cache Logical Partition](#)” on page 32).

Figure 2 illustrates the use of cache memory within a corporation. In this example, the cache memory is partitioned into three segments of 40 GB each, which are each allocated to a branch office. The host of branch A has a heavy I/O load. Because the cache memory is partitioned, that heavy I/O load does not impact the cache memory for the other two branches.

You can create up to 32 cache logical partitions in one storage system, including the default CLPR 0. See “[Creating a Cache Logical Partition](#)” on page 32 for instructions on creating cache logical partitions.

Figure 2 illustrates a cache logical partition.

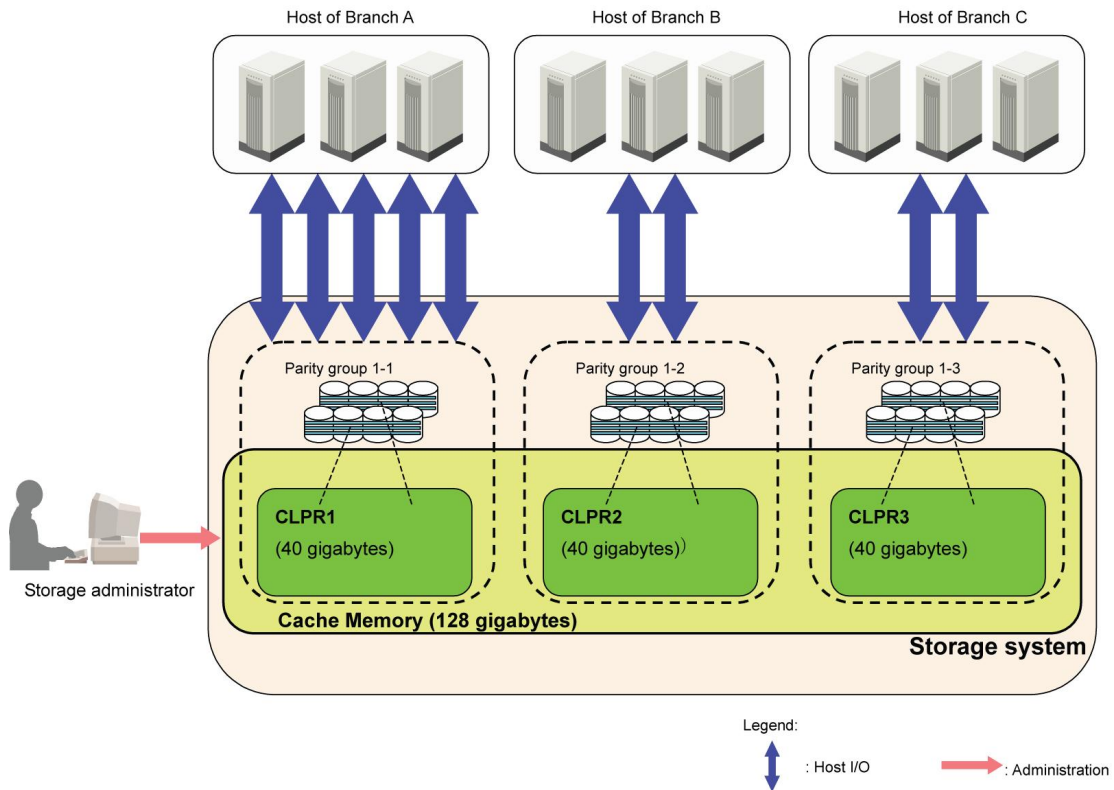


Figure 2 Cache Logical Partition (CLPR)

Table 1 lists the recommended cache capacity, which is determined by the CLPR data capacity.

Table 1 CLPR Data Capacity and the Recommended Cache Capacity

CLPR Data Capacity	Recommended Cache Capacity
Less than 720 GB	4 GB or more
720 GB or more	8 GB or more
2,900 GB or more	12 GB or more
8,650 GB or more	16 GB or more
14,400 GB or more	20 GB or more
20,160 GB or more	24 GB or more
128,000 GB or more	28 GB or more
146,000 GB or more	32 GB or more

CLPR Data Capacity	Recommended Cache Capacity
182,000 GB or more	40 GB or more
218,000 GB or more	48 GB or more
254,000 GB or more	56 GB or more
290,000 GB or more	64 GB or more
326,000 GB or more	72 GB or more

**To calculate the data capacity:**

The number of 3D+1P parity groups x capacity of one HDD x 3  
+ the number of 6D+2P parity groups x capacity of one HDD x 6  
+ the number of 7D+1P parity groups x capacity of one HDD x 7  
+ the number of 2D+2D parity groups x capacity of one HDD x 2

**To calculate the cache capacity for a CLPR:**

Cache capacity (GB)  
=Recommended cache capacity (GB)+  
(Cache Residency capacity(MB)/2,048) x 2 GB

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# 3 Preparing for XP Disk/Cache Partition Operations

This chapter discusses the preparation needed for XP Disk/Cache Partition operations.

- [Storage Administrator and Storage Partition Administrator Privileges](#), page 13
- [Possible Interacting and Conflicting Functions](#), page 15

## Storage Administrator and Storage Partition Administrator Privileges

Once the XP Disk/Cache Partition license key has been installed for the HP StorageWorks XP Remote Web Console Java API, a storage administrator with write permission for XP Disk/Cache Partition can then log on to the storage system and allocate license capacities to various storage logical partitions as needed, using the License Key Partition Definition panel. See "[License Key Partition Definition Window](#)" on page 24 for a description of the window, and "[Partitioning and Allocating Licensed Capacity to Storage Logical Partitions](#)" on page 30 for instructions on allocating license key capacity to the SLPRs.

You will need to either purchase an unlimited license for an option, or allocate the license capacity for that option among the various SLPRs. You will also need to enable or disable each option for each of the storage logical partitions. You cannot use an option in SLPRs until the license capacity has been allocated.

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### NOTE:

A storage partition administrator has authority only within the assigned storage logical partition. Only storage administrators can make settings for SLPR 0. The storage administrator can also assign write permission for one or more of the following functions:

- 
- Open Volume Management
  - Volume Shredder
  - Data Retention Utility
  - LUN Manager
  - Cache Residency Manager
  - XP Performance Monitor
  - XP Remote Web Console
  - API

Administrator access for the storage system is divided into two types:

- **Storage Administrators** manage the entire storage system and all of its resources, can create and manage storage logical partitions and cache logical partitions, and assign access permission for storage partition administrators. Storage administrators have sole access to the following functions:

- Accessing Storage Logical Partition 0 (SLPR 0) and Cache Logical Partition 0 (CLPR 0)
- Managing mainframe volumes
- **Storage Partition Administrators** can view and manage only those resources that have been assigned to a specific storage logical partition. Storage partition administrators have access only to the functions listed below. If a storage partition administrator is not granted write access to a particular function, view access is available.
  - System Information
    - Information (Read Only)
  - LUN Manager
    - Port
    - Authentication
  - Volume Manager
    - LUN Expansion
    - Customized Volume
  - Cache Residency
  - XP Auto LUN / Perf Ctl / Perf Mon
    - XP Performance Monitor
    - XP Auto LUN
  - Data Retention Utility
  - Security
    - Account

For detailed information on each function, see the manual for each program product. For instructions on creating storage partition administrators and granting write access to one or more products, see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*. For information about the functions that are not available for storage partition administrators, also see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*.

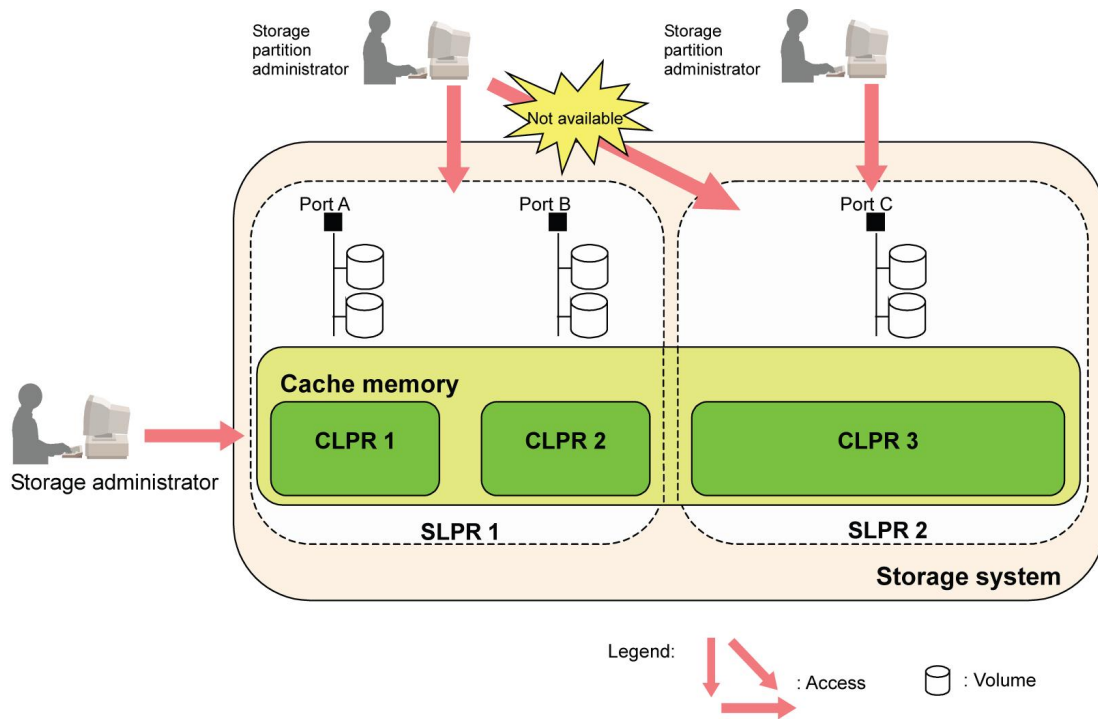


Figure 3 Storage Administrator and Storage Partition Administrator Privileges

## Possible Interacting and Conflicting Functions

It is possible for actions taken by a storage administrator to interact and conflict with actions taken by a partition storage administrator.

**WARNING:** If you are using HP StorageWorks XP RAID Manager, you must use command device security for the affected logical volumes, to prevent RAID Manager commands from having effects across SLPR boundaries. For more information on RAID Manager, see the *HP StorageWorks XP RAID Manager User's Guide*. For more information on securing command devices, see the *HP StorageWorks XP24000/XP20000 LUN Manager User's Guide*.

Before a storage administrator or storage partition administrator can create a customized volume (CV) using the Virtual LVI/LUN (VLL) function, the storage administrator must allocate the CU numbers to the SLPR. This is necessary so that the storage partition administrator can allocate LDEVs to those CU numbers when creating a customized volume. For more information on the VLL function, see the *HP StorageWorks XP24000/XP20000 Virtual LVI/LUN (VLL) and Volume Shredder User's Guide*.

**WARNING:** Making settings across SLPR boundaries is strongly discouraged, because you could cause unintended and serious consequences, including having a storage partition administrator be unable to perform one or more functions. If you attempt to make settings across more than one SLPR, a warning message is displayed. If you do make settings across SLPR boundaries, be extremely careful to avoid conflicts in LDKC, CU, and volume numbers across the various storage logical partitions.

For example, if a storage administrator performs any of the following types of actions across SLPR boundaries, this could cause serious problems for the storage partition administrators:

- Manual migration with volume migration. For more information, contact HP technical support. See ["Calling HP Technical Support"](#) on page 36.
- XP Business Copy Quick Restore (see the *HP StorageWorks XP24000/XP20000 Business Copy Software User's Guide* and the *Hitachi ShadowImage™ for Mainframe User's Guide: HP XP24000 Disk Array, HP XP20000 Disk Array*)

- LU path settings and High Speed settings (see the *HP StorageWorks XP24000/XP20000 LUN Manager User's Guide*)
- LUSE settings (see the *HP StorageWorks XP24000/XP20000 LUN Expansion User's Guide*)

If you are using HP StorageWorks XP Continuous Access Journal Software, XP Continuous Access Journal data volumes and journal volumes can belong to the different CLPRs. All journal volumes in the same journal group must belong to the same CLPR. For more information on XP Continuous Access Journal, see the *HP StorageWorks XP24000/XP20000 Continuous Access Journal Software User's Guide*.

Figure 4 shows an example involving manual volume migration. In this example, volume LDKC00:CU01:LDEV05 is manually migrated from SLPR1 to SLPR2, and volume LDKC00:CU02:LDEV10 is manually migrated from SLPR2 to SLPR1. CU01 is allocated to SLPR1. Because volume LDKC00:CU01:LDEV05 belonged to CU01 before the manual migration, there is no conflict. However, volume LDKC00:CU02:LDEV10 will be allocated to CU01 after manual migration, and that CU number conflicts with the volume number.

If the CU number does not correspond with the volume number in the SLPR, an error does not occur, but this can make storage system administration more difficult, particularly when you need to perform a forced manual migration between the different SLPRs. For further information on the customized volume, see the *HP StorageWorks XP24000/XP20000 LUN Manager User's Guide*. For more information, contact the HP technical support. See “[Calling HP Technical Support](#)” on page 36.

<An example of forcibly performing Manual Migration of Auto LUN between SLPR1 and SLPR2>

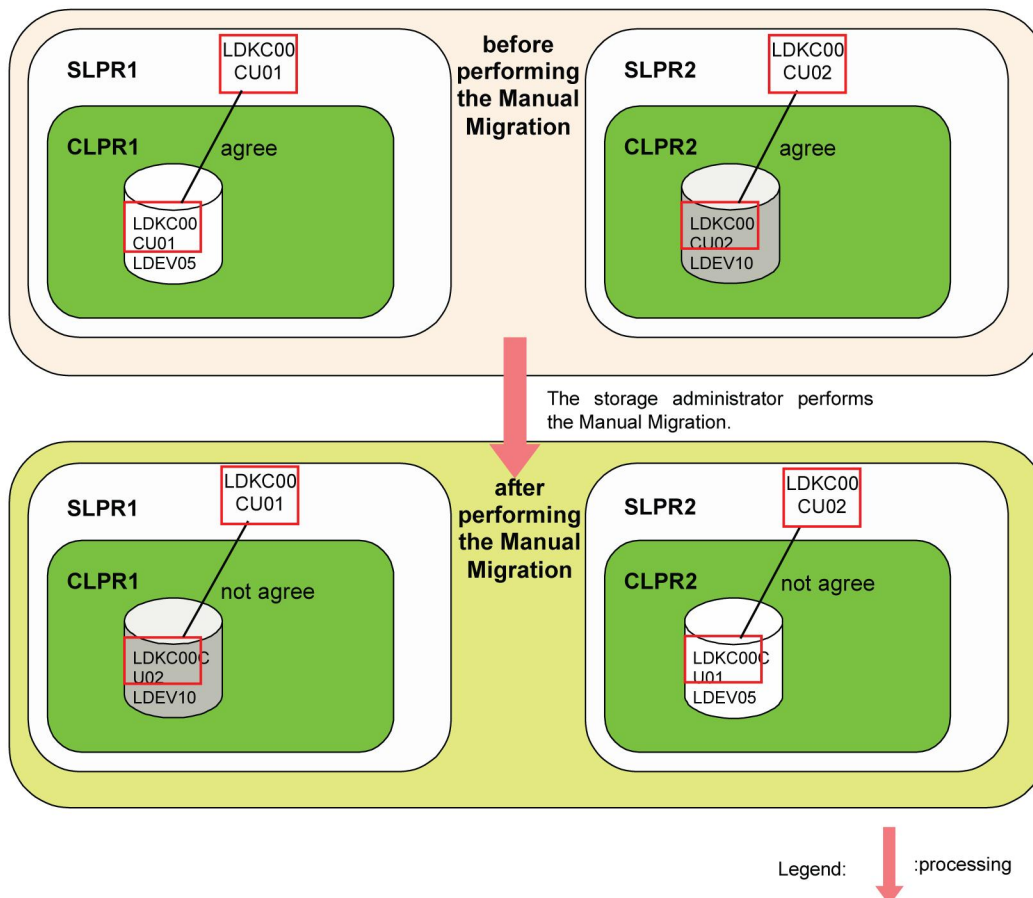


Figure 4 Manual Migration between SLPRs



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# 4 Using the XP Disk/Cache Partition GUI

This chapter describes the windows that comprise the XP Disk/Cache Partition GUI.

- [Logical Partition Window](#), page 17
- [Storage Management Logical Partition Window](#), page 19
- [Cache Logical Partition Window](#), page 21
- [Select CU Dialog Box](#), page 23
- [License Key Partition Definition Window](#), page 24

## Logical Partition Window

To open the Partition Definition window, from the XP Remote Web Console main window click **Go**, then **Environmental Settings**. Select **Partition Definition**, and then select a storage system in the Logical Partition tree. If you are logged on as a storage partition administrator, this window shows only the resources in that storage partition.

The Logical Partition window has the following features.

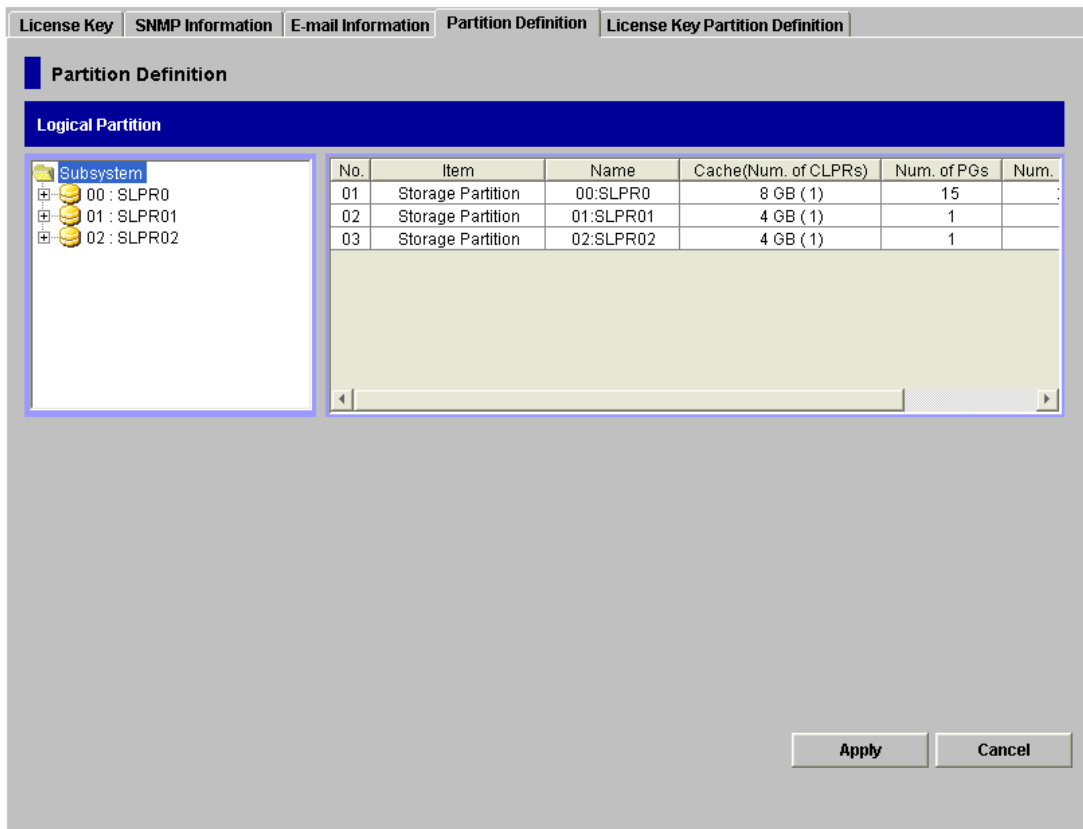


Figure 5 Logical Partition Window (Storage System Selected)

Table 2 Logical Partition Window Details (Storage System Selected)

Item	Description
<b>Partition definition tree</b>	The storage system and all of its logical partitions. The name and number of the storage logical partition are displayed to the right of each SLPR icon.
<b>Storage system resource list</b>	The list provides the following information: <ul style="list-style-type: none"> <li>• <b>No.:</b> The storage system resource list number</li> <li>• <b>Item:</b> The resource type (Storage Partition)</li> <li>• <b>Name:</b> The storage logical partition numbers and names</li> <li>• <b>Cache (Num. of CLPRs):</b> The cache capacity and number of cache logical partitions</li> <li>• <b>Num of PGs:</b> Number of parity groups. For SLPR 0, the amount is calculated by subtracting the number of parity groups of all other SLPRs from those of SLPR 0.</li> <li>• <b>Num of Ports:</b> Number of ports. For SLPR 0, the amount is calculated by subtracting the number of ports of all other SLPRs from those of SLPR 0.</li> </ul>
<b>Apply</b>	Implements the settings that were made in this window
<b>Cancel</b>	Cancels any settings that were made in this window

# Storage Management Logical Partition Window

The Storage Management Logical Partition window displays if you select an SLPR in the Partition Definition tree of the Partition Definition tab. If you are logged on as a storage partition administrator, this window shows only the resources in that storage partition.

The Storage Management Logical Partition window has the following features.

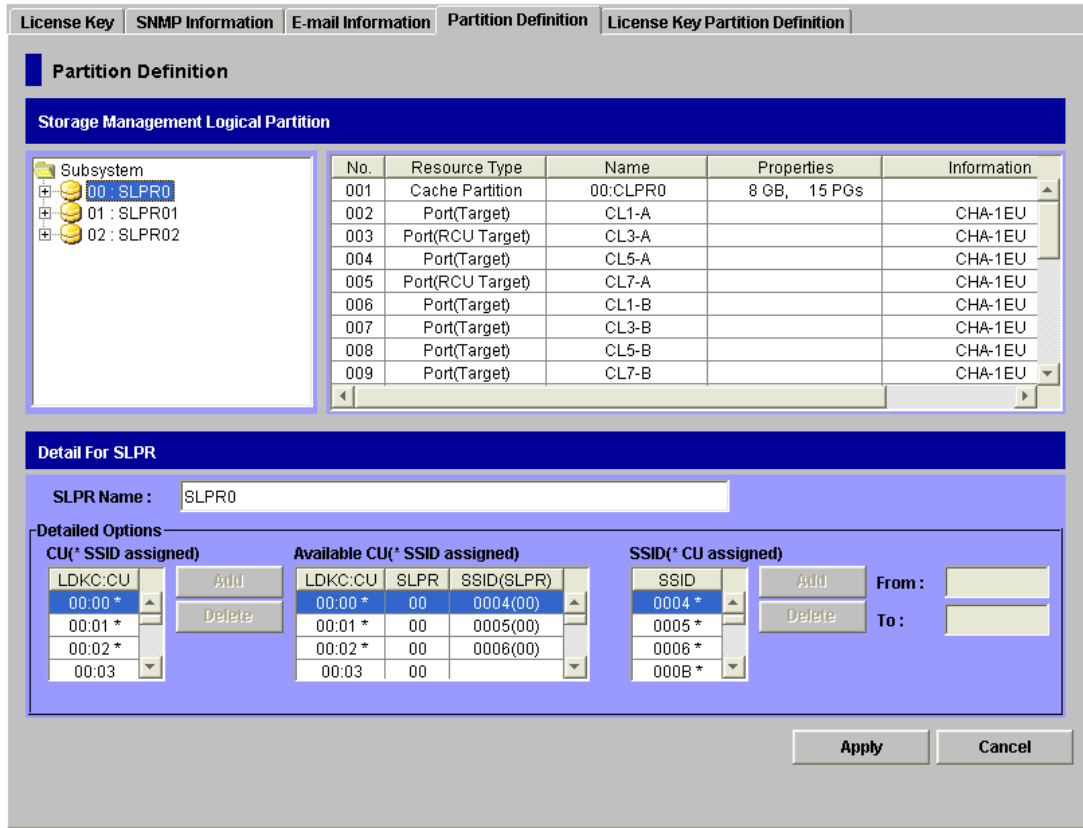


Figure 6 Storage Management Logical Partition Window (SLPR Selected)

Table 3 Storage Management Logical Partition Window (SLPR Selected)

Item	Description
Partition definition tree	The storage system and all of its logical partitions. The name and number of the storage logical partition are displayed to the right of each SLPR icon. The cache logical partition number and name are displayed to the right of each CLPR icon.

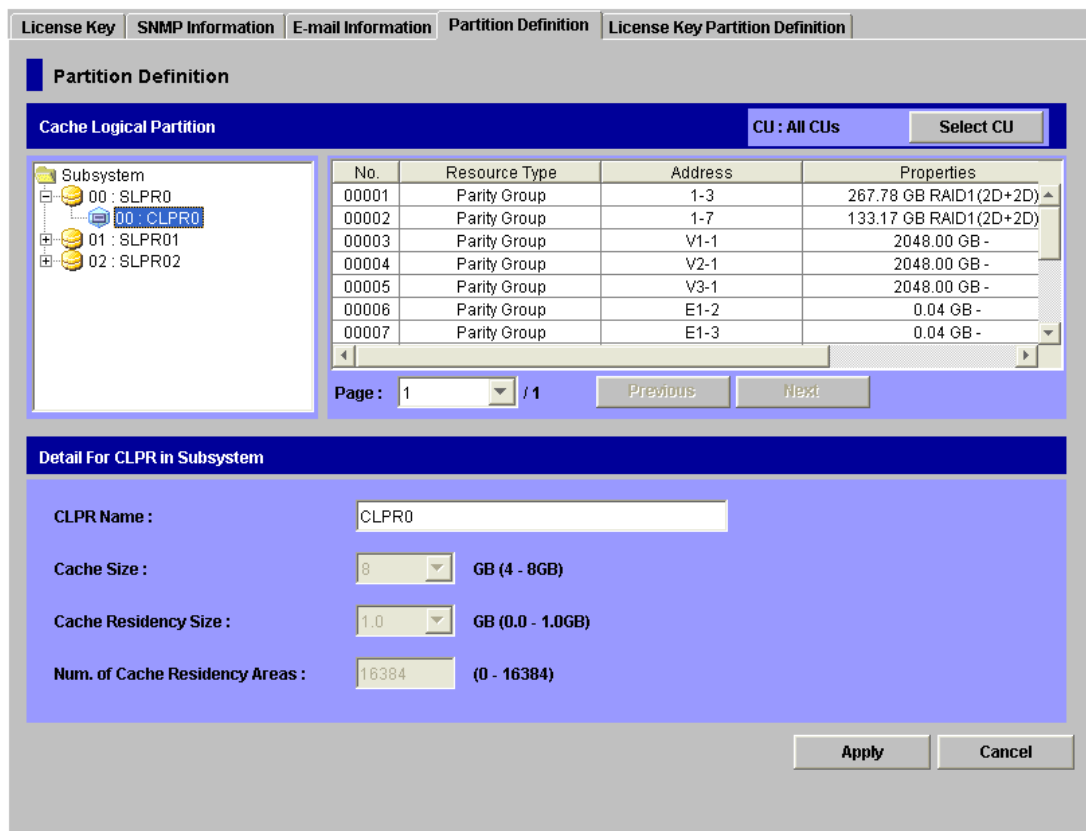
Item	Description
Storage logical partition resource list	<p>When a storage logical partition is selected the Partition Definition tree, the Storage Logical Partition resource list shows resource information, including logical partitions and ports, for the selected storage logical partitions cache.</p> <p>If <b>SLPR 0</b> is selected in the Storage Logical Partition tree, this list shows all resources not specifically assigned to another SLPR.</p> <p>The list provides the following information:</p> <ul style="list-style-type: none"> <li>• <b>No.:</b> The line number</li> <li>• <b>Resource Type:</b> The resource type, including Cache Partition or Port (type)</li> <li>• <b>Name:</b> The resource name <ul style="list-style-type: none"> <li>• If the resource type is <b>Cache Partition</b>, the CLPR number and name are displayed.</li> <li>• If the resource type is <b>Port</b>, the port name displays.</li> </ul> </li> <li>• <b>Properties:</b> The capacity and number of parity groups allocated to the selected cache logical partition</li> <li>• <b>Information:</b> If the resource is a port, this is the channel adapter name.</li> </ul>
Detail for SLPR	<p>The settings of the selected storage logical partition. See “<a href="#">Creating a Storage Logical Partition</a>” on page 29 for more information on storage logical partition operations.</p> <p>If the storage partition administrator wants to use the Virtual LVI/LUN (VLL) function, the CU numbers and SSIDs must have previously been specified for each storage logical partition, so that newly allocated CU numbers and SSIDs will not overlap those in another storage logical partition. For more information on Virtual LVI/LUN, see the <i>HP StorageWorks XP24000/XP20000 Virtual LVI/LUN (VLL) and Volume Shredder User's Guide</i>.</p> <ul style="list-style-type: none"> <li>• <b>SLPR Name:</b> The name of the storage logical partition, up to 32 alphanumeric characters. This field allows you to set or change the name of the storage logical partition, provided that it is within the selected CU.</li> <li>• <b>CU (*: SSID assigned):</b> The LDKC and CU number of the specified SLPR (00 to FE). An asterisk (*) indicates that the SSIDs are assigned to the CU. To delete a CU from the specified SLPR, select that CU from this list and click <b>Delete</b> to return the CU to the Available CU list.</li> <li>• <b>Available CU (* SSID assigned):</b> <ul style="list-style-type: none"> <li>• <b>LDKC:CU:</b> the LDKC and CU numbers. An asterisk (*) indicates that the SSIDs are assigned to the CU.</li> <li>• <b>SLPR:</b> Displays the SLPR for that CU</li> <li>• <b>SSID (SLPR):</b> If the SSID is assigned to the CU, it displays here. The SLPR for that SSID displays to the right.</li> </ul> </li> <li>• <b>SSID (* CU assigned):</b> This is the SSIDs in the selected storage logical partition (0004 to FFFE). An asterisk (*) indicates that the SSID is assigned to a CU. You can select up to 510 CUs that do not have SSIDs assigned and/or CUs that have SSIDs assigned.</li> </ul> <p>If a customized volume (CV) is set by using Virtual LVI/LUN, and the CU No. and SSID are registered to different storage logical partition, a dash (-) displays to the right of the SSID number. For more information on the VLL function, see the <i>HP StorageWorks XP24000/XP20000 Virtual LVI/LUN (VLL) and Volume Shredder User's Guide</i>.</p> <ul style="list-style-type: none"> <li>• <b>From</b> The starting number of the SSID that is added (0004 to FFFE). This number must be smaller than the number that is entered into the <b>To</b> field.</li> <li>• <b>To</b> The ending number of the SSID that is added (0004 to FFFE). You may enter up to 2040 SSIDs from SLPR 0.</li> </ul> <p>To add one or more SSIDs to the SLPR, enter the starting number into the From: field, and the last number into the <b>To</b> then click <b>Add</b>. To delete an SSID from the SSID box, select that SSID and click <b>Delete</b>.</p>
Apply	Implements the settings that were made in this window

Item	Description
Cancel	Cancels any settings that were made in this window

## Cache Logical Partition Window

The Cache Management Logical Partition window (see [Figure 7](#)) displays if you select a CLPR in the Partition Definition tree of the Partition Definition tab. If you are logged on as a storage partition administrator, this window shows only the resources in that storage partition.

The Cache Logical Partition window has the following features.






**Figure 7** Cache Logical Partition Window (CLPR Selected)

**WARNING:** Before changing the cache size or the cache residency size, verify that CLPR 0 has at least 4 GB remaining after subtracting the cache residency size from the cache size.

**Table 4** Cache Logical Partition Window Details (CLPR Selected)

Item	Description
CU	Indicates either <b>All CUs</b> or the selected CU number.
Selected CU	Open the Select CU dialog box, see <a href="#">Figure 17</a> on page 34.

Item	Description
<b>Partition Definition tree</b>	<p>All of the storage logical partitions and cache logical partitions in the storage system. The storage logical partition number and name are displayed to the right of the each SLPR icon (). The cache logical partition number and name are displayed to the right of the CLPR icon (.</p>
<b>Cache Logical Partition Resource List</b>	<p>When a CLPR is selected in the Partition Definition tree, the Cache Logical Partition resource list show the resource information for the selected CU and CLPR.</p> <p>If CLPR 0 is selected in the Cache Logical Partition tree, this list shows all resources not already assigned to other partitions.</p> <p>The list provides the following information:</p> <ul style="list-style-type: none"> <li>• <b>No.</b> The row number</li> <li>• <b>Resource Type</b> Type of resources of CLPR. <b>Parity Group</b> is displayed in this column</li> <li>• <b>Address</b> <p>An address beginning with the letter E (for example, E1-1) indicates that the parity group contains external volumes.</p> <p>An address beginning with M (for example, M1-1) indicates that the parity group contains migration volumes.</p> <p>An address beginning with the letter V (for example, V1-1) indicates that the parity group contains HP StorageWorks XP Snapshot virtual volumes.</p> <p>An address beginning with the letter X (for example, X1-1) indicates that the parity group contains HP StorageWorks XP Thin Provisioning Software virtual volumes.</p> </li> <li>• <b>Properties</b> <p>If a parity group contains internal volumes, the parity group and RAID configuration are displayed.</p> <p>If a parity group contains external volumes, the volume capacity is displayed, but the RAID configuration is not displayed.</p> <p>If a parity group contains virtual volumes (for example, XP Snapshot or XP Thin Provisioning), the volume capacity is displayed, but the RAID configuration is not displayed.</p> </li> <li>• <b>Emulation</b> Emulation type of the parity group</li> </ul>

Item	Description
<p><b>Detail for CLPR in System</b></p>	<p>Allows you to set or change the settings of the specified cache logical partition. See “<a href="#">Cache Logical Partition Operations</a>” on page 31 for more information on cache logical partition operations.</p> <p>You cannot directly change the capacity value of CLPR 0. Any changes in the capacity of the other CLPRs will be reflected in the capacity of CLPR 0.</p> <p>The maximum available cache capacity (mounted cache less the cache in use by other cache logical partitions) displays for the upper limit of <b>Cache Size</b>, <b>Cache Residency Size</b>, <b>Num. of Cache Residency Areas</b>. For more information on Cache Residency, see <i>HP StorageWorks XP24000/XP20000 Cache Residency Manager User's Guide</i>.</p> <ul style="list-style-type: none"> <li>• <b>CLPR Name</b> allows you to set or change the name of the cache logical partition, provided that it is within the selected CU. You can use up to 16 alphanumeric characters.</li> <li>• <b>Cache Size</b> setting, as illustrated in <a href="#">Figure 7</a> on page 21, allows you to set or change the cache capacity of each cache logical partition. You may select 4 GB or more up to a maximum size of 508 GB, which is 4 GB smaller than the cache size of the whole storage system. From a default value of 4 GB, you may increase the size in 2 GB increments. <b>Cache Residency Size</b> setting, also illustrated in <a href="#">Figure 7</a> on page 21, allows you to set or change the capacity of the Cache Residency cache. You may select nothing (0 GB) to a maximum size of 504 GB, which is the Cache Residency size of the entire storage system. The default value is 0 GB, to which you may add capacity in 0.5 GB increments.</li> <li>• <b>Cache Residency Size</b> allows you to set or change the capacity of the Cache Residency cache. The value of Cache Residency size must be selected or input from 0 to 248 GB in 0.5 GB increments. The default value is 0 GB. <b>Note:</b> If you have previously defined cache residency size for this cache logical partition using Cache Residency Manager, the Cache Residency size selected for this cache logical partition must be greater than that which was previously defined. Use Cache Residency Manager to verify the size <i>before</i> you set the value for this field.</li> <li>• <b>Num. of Cache Residency Areas</b> allows you to set or change the number of Cache Residency areas, from 0 to 16,384. The default value is 0.</li> </ul> <hr/> <p> <b>NOTE:</b></p> <p>If you have previously defined Cache Residency areas for this cache logical partition using Cache Residency Manager, the number of Cache Residency areas selected for this cache logical partition must be more than that which was previously defined. Use Cache Residency Manager to verify the number of areas <i>before</i> you set the value for this field.</p> <hr/>
<p><b>Apply</b></p>	<p>Implements settings made in this window</p>
<p><b>Cancel</b></p>	<p>Cancels any settings made in this window</p>

## Select CU Dialog Box

To open the Select CU Dialog box, click **Select CU** on the Cache Logical Partition window (see [Figure 8](#)).

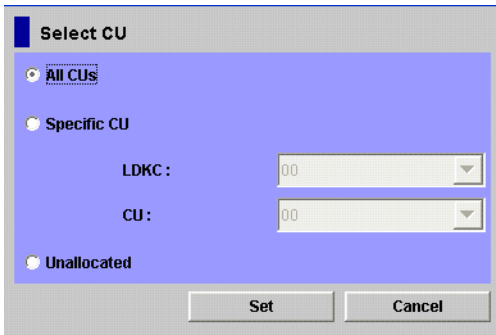


Figure 8 Select CU Dialog Box

Table 5 Select CU Dialog Box Details

Item	Description
All CUs	When selected, information about all CUs can be displayed on the CLPR resource list.
Specific CU	When selected, information about only the specified CU can be displayed on the CLPR resource list. <ul style="list-style-type: none"> <li>Use the <b>LDKC</b> list to specify <b>LDKC</b></li> <li>Use the CU list to specify CU</li> </ul>
Unallocated	When selected, only the information about CUs unallocated to CLPR is displayed on the CLPR resource list.
Set	Implements settings made in this window
Cancel	Cancels any settings made in this window

## License Key Partition Definition Window

The License Key Partition Definition window (see [Figure 9](#)) lists options that are available to storage logical partitions. From here, a storage administrator with the storage administrator role enabled can allocate license key capacity among various storage logical partitions. Each option must first be installed from the License Key window before its license capacity can be partitioned. For more information on installing options, see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*.

To open the License Key Partition Definition window, from the XP Remote Web Console main window click **Go**, and then click **Environmental Settings**. Select the License Key Partition Definition tab.



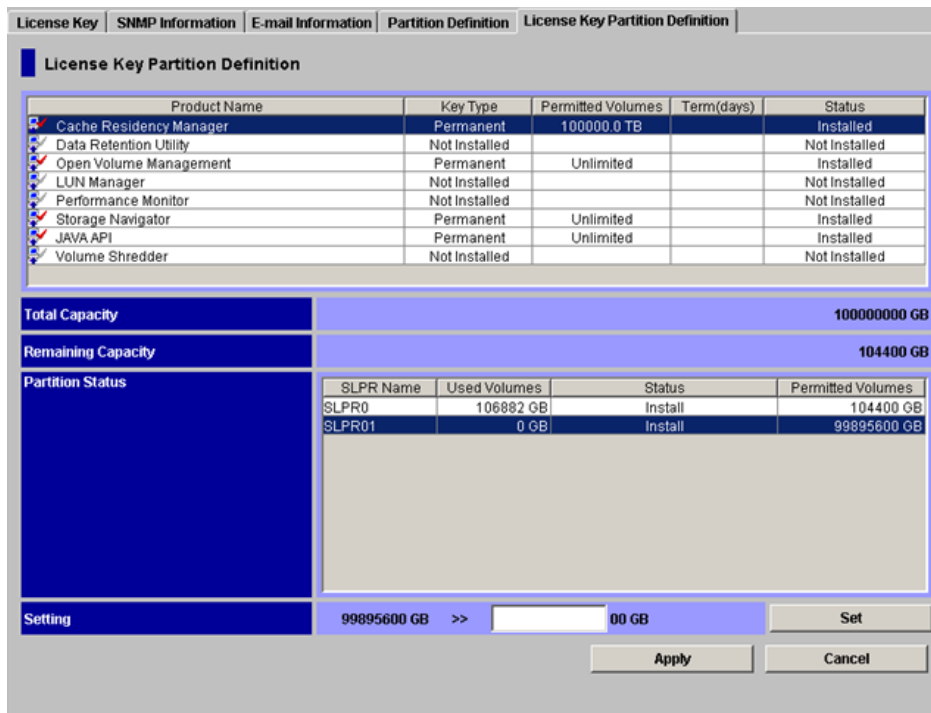


Figure 9 License Key Partition Definition Window

The Product Name list is on the upper part of the window (see Figure 10), and lists the program products for which the licensed capacity can be allocated to SLPRs.

Product Name	Key Type	Permitted Volumes	Term(days)	Status
Open Volume Management	Permanent	60.0 TB		Installed
Data Retention Utility	Permanent	Unlimited		Installed
LUN Manager	Permanent	Unlimited		Installed
Cache Residency Manager	Permanent	Unlimited		Installed
Performance Monitor	Permanent	Unlimited		Installed
XP Remote Web Console	Permanent	Unlimited		Installed
JAVA API	Permanent	Unlimited		Installed
Volume Shredder	Permanent	Unlimited		Installed

Figure 10 Product Name List

Table 6 Product Name List Details

Item	Description
<b>Product Name</b>	Name of the product, including: <ul style="list-style-type: none"> <li>• Option name</li> <li>• Installed/Not Installed icon:</li> </ul> indicates <b>Installed</b> indicates <b>Not Installed</b>

Item	Description
Key Type	The license type: <b>Permanent</b> , <b>Temporary</b> or <b>Emergency</b> . <b>Not Installed</b> is displayed, when the option is not installed. Since all the SLPRs will be available when the key type of the program product is Temporary or Emergency, you do not need to separate each SLPR. Therefore, no partition status information for the program product whose key type is Temporary or Emergency will be displayed in the License Key Partition Definition window, so that you cannot partition the SLPR for that program product. <b>Unlimited</b> is displayed if the size is unlimited.
Permitted Volumes	Capacity Information: <ul style="list-style-type: none"> <li>Available capacity (licensed capacity). Licensed capacities are calculated assuming that 1 KB = 1,024 bytes, 1 MB = 1,024 KB, 1 GB = 1,024 MB, and 1 TB = 1,024 GB.</li> <li>Capacity that is already being used. For example, if this column shows 10.0 TB (2.50 TB), the licensed capacity is 10.0 TB and the capacity already being used is 2.50 TB.</li> <li><b>Unlimited</b> is displayed if the size is unlimited.</li> </ul>
Term (days)	The number of days that remain before temporary or emergency key expiration. After the temporary key has expired, this column shows the number of days that remain before you can re-install the temporary key.
Status	The option's current status: <ul style="list-style-type: none"> <li><b>Installed</b> indicates that the option is available. The <b>Product Name</b> column displays the <b>Installed</b> icon (📁).</li> <li><b>Not Installed</b> indicates that the option is not available. The <b>Product Name</b> column displays the <b>Not Installed</b> icon (📁).</li> <li><b>Not Enough</b> indicates that the volume capacity is insufficient. The <b>Product Name</b> column displays the <b>Not Installed</b> icon (📁).</li> <li><b>Capacity Insufficient</b> indicates that the licensed capacity is insufficient because disk drives have been added. The <b>Product Name</b> column displays the <b>Installed</b> icon (📁), but you must purchase additional licensed capacity before the license key expires.</li> <li><b>Expired</b> indicates that the license key of an option that had been in the Capacity Insufficient status has expired. The <b>Product Name</b> column displays the <b>Not Installed</b> icon (📁).</li> <li><b>Time Out</b> indicates that the term has already expired for the temporary key. The <b>Product Name</b> column displays the <b>Not Installed</b> icon (📁).</li> </ul>

When you select an option, the capacity list, which is directly under the Product Name list, is updated (see [Figure 11](#)).

Total Capacity	2000 GB
Remaining Capacity	2000 GB

**Figure 11 Capacity List**

**Table 7 Capacity List Details**

Item	Description
Total Capacity	Total licensed capacity for the selected option.
Remaining Capacity	The remaining licensed capacity (in GB) that is not yet allocated to any SLPR among the entire licensed capacity for the selected option.

After selecting an option, **Partition Status List and Setting Box** is displayed under the information about the licensed capacity (see [Figure 12](#), [Figure 13](#), and [Figure 14](#)). This allows you to select and display information regarding a storage logical partition.

SLPR Name	Used Volumes	Status	Permitted Volumes
SLPR0	106882 GB	Install	104400 GB
SLPR01	0 GB	Install	99895600 GB

**Figure 12 Partition Status List**

The Partition Status list provides the following information for the selected option.

**Table 8 Partition Status List Details**

Item	Description
<b>SLPR Name</b>	Storage logical partition name.
<b>Used Volume</b>	Amount of licensed capacity currently being used.
<b>Status</b>	Volume status, which is determined by comparing allocated licensed capacity ( <b>Permitted Volumes</b> ) and used licensed capacity ( <b>Used Volumes</b> ): <ul style="list-style-type: none"> <li>• <b>Installed:</b> License capacity for this option has been allocated to the SLPR. If the license capacity is limited, this indicates that the partitioned licensed capacity is allocated to the SLPR and the allocated licensed capacity is more than the capacity of <b>Used Volumes</b>. A storage partition administrator can use the option in the allocated SLPR.</li> <li>• <b>Not Installed:</b> No license and licensed capacity for the selected option are allocated to the SLPR.</li> <li>• <b>Capacity Insufficient:</b> Licensed capacity that is allocated to the SLPR (<b>Permitted Volumes</b>) is less than the currently used licensed capacity (<b>Used Volumes</b>). When the trial period still remains, the number of remaining days display in parentheses.</li> </ul>
<b>Permitted Volumes</b>	Allocated licensed capacity to SLPR in GB when the option without unlimited licensed capacity is selected. Blank when the option with unlimited licensed capacity is selected.

After selecting an option and an SLPR, if you select an option with an unlimited license capacity, or where the licensed capacity is not relevant, the Setting box looks like [Figure 13](#).



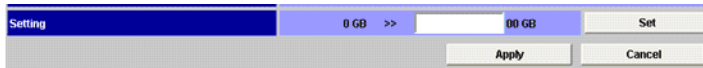
**Figure 13 Setting Box (Licensed Capacity Unlimited or Not Relevant)**

**Table 9 Setting Box Details (Licensed Capacity Unlimited or Not Relevant)**

Item	Description
<b>Enable</b>	Enables the license key for selected option.
<b>Disable</b>	Disables the license key for the selected option.

If you select an option with a limited license capacity, the Setting box looks like [Figure 14](#). You may enter the licensed capacity to be allocated to the SLPR.

However, you cannot set the licensed capacity of SLPRO. If you select SLPRO, Set will be inactive.



**Figure 14 Setting Box (License Capacity Limited)**

**Table 10 Setting Box Details (License Capacity Limited)**

Item	Description
<b>Set</b>	Selects the setting. The selected row of the option list and the Partition Status list change to <i>blue bold italics</i> , and the displayed capacity in the Remaining Capacity field changes to the new capacity. <b>IMPORTANT:</b> The setting is not implemented until you click <b>Apply</b> (below).
<b>Apply</b>	Implements the setting in the storage system.
<b>Cancel</b>	Cancels the setting.

---

# 5 XP Disk/Cache Partition Operations

This chapter provides detailed instructions for XP Disk/Cache Partition operations.

- [Storage Logical Partition Operations](#), page 29
- [Cache Logical Partition Operations](#), page 31

## Storage Logical Partition Operations

Storage logical partition operations have the following requirements:

- You must have storage administrator access for all storage logical partition actions described in this section.
- If you have not yet created any storage logical partitions, all resources will belong to SLPR 0.
- Mainframe volumes must be allocated to SLPR 0, and cannot be migrated. Mainframe operations must be performed by storage administrators.
- If you want to allocate a port to an SLPR other than SLPR 0, it must be a Target port.
- Before you create a customized volume (CV) in a storage logical partition using the Virtual LVI/LUN (VLL) function, you must allocate the CU numbers to that SLPR. This is necessary so that the storage partition administrator can allocate LDEVs to those CU numbers when creating a customized volume. For more information on the VLL function, see the *HP StorageWorks XP24000/XP20000 Virtual LVI/LUN (VLL) and Volume Shredder User's Guide*.
- For instructions on creating storage partition administrators and granting write access to one or more products, see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*.

## Creating a Storage Logical Partition

To create storage logical partition:

1. From the Partition Definition window, right-click a storage system in the Partition Definition tree, then select **Create SLPR**. This adds a storage logical partition to the Partition Definition tree. In addition to the default SLPR 0, you can create up to 31 storage logical partitions, either at this point in the process or at a later time.
2. Select the SLPR that you want to define from the Partition Definition tree. This opens the Storage Management Logical Partition window.
3. In the **SLPR Name** field, enter the name of the selected SLPR. You can use up to 32 alphanumeric characters.
4. In the **CU** field, enter the CU numbers for the selected SLPR (00-FE). An asterisk (\*) indicates that the SSID is assigned to the CU:
  - To add a CU to the SLPR, select the CU from the Available CU list, then click **Add** to move that CU to the CU list. You can select up to 64 CUs, whether or not those CUs are defined as LDEVs.
  - To delete CU from the specified SLPR, select the CU from the CU list and click **Delete** to return that CU to the Available CU list.
5. Available SSIDs are in SLPR 0. In the SSID field, select an available SSID as follows:

- In the **From** field, enter the starting number of the SSID (0004 to FFFE).
- In the **To** field, enter the ending number of the SSID.

6. Click **Apply** to apply the settings, or click **Cancel** to cancel the settings.

**Note:** At this point in the process, the newly created storage logical partition has no resources (for example, cache logical partitions and ports). See “[Migrating Resources To and From Storage Logical Partitions](#)” on page 30 for instructions on migrating resources. See “[Partitioning and Allocating Licensed Capacity to Storage Logical Partitions](#)” on page 30 for instructions on adding and deleting resources.

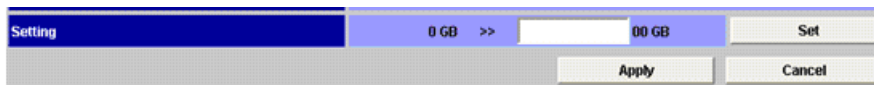
## Partitioning and Allocating Licensed Capacity to Storage Logical Partitions

You must already have created at least one SLPR in order to perform the operations in this section.

1. Log on as a storage administrator with write authority for XP Disk/Cache Partition and open the XP Remote Web Console main window. Change to Modify mode.
2. On the menu bar, click **Go, Environmental Settings**, and then **License Key Partition Definition** to open the License Key Partition window (see [Figure 9](#) on page 25).
3. Select an option in the Product Name list. The Partition Status and Setting boxes are displayed at the bottom of the window. In the Partition Status box, select a storage logical partition.
4. If license capacity for that option is limited, enter in the desired license capacity for this option (see [Figure 15](#)).

However, you cannot set the licensed capacity of SLPRO.

5. If the licensed capacity for that option is unlimited, click **Enable** in the Setting box (see [Figure 16](#)).
6. Select **Set**. The new setting is displayed in the Remaining Capacity and Partition Status boxes.
7. Make additional settings, if desired, using above instructions.
8. Click **Apply** to implement setting, or click **Cancel**.



**Figure 15** Selecting the License Capacity



**Figure 16** Selecting Enable (License Capacity Unlimited)


## Migrating Resources To and From Storage Logical Partitions

The resources of a storage logical partition include cache logical partitions and ports, which can be migrated to another storage logical partition as needed. This process has the following restrictions:

- You can only migrate resources within the same LDKC.
- The only ports that can be migrated are Target ports. Initiator ports, RCU Target ports and External ports cannot be migrated, and must remain in SLPR 0.
- Mainframe parity groups cannot be migrated out of SLPR 0.

To migrate one or more resources:

1. Open the Partition Definition window, and select an SLPR in the Partition Definition tree to open the Storage Management Logical Partition window.

2. From the Storage Logical Partition Resource List, select one or more cache logical partitions and/or target ports to be migrated. Right-click to display the pop-up menu, then click **Cut**. SLPRs from other CUs are grayed out and unavailable.
3. On the Partition Definition tree, select the SLPR to which you want to migrate resources. SLPRs from other CUs are grayed out and unavailable.
4. Right-click to display the pop-up menu, then click **Paste CLPRs, Ports**. You can select up to 31 CLPRs (not including CLPR 0) and 256 ports. A colored icon () and black characters indicate available destination SLPRs.
5. Cache logical partitions will be added to both the Partition Definition tree and the Storage Management Logical Partition resource list. Ports will be added only to the SLPR resource list.
6. Click **Apply** to apply the settings.

## Deleting Storage Management Logical Partitions

If you delete a storage logical partition, any resources in that storage logical partition will be automatically returned to SLPR 0. SLPR 0 cannot be deleted

**Note:** Before deleting a storage logical partition, you must do the following:

- Delete all user accounts for that SLPR. For more information, see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*.
  - Either set the license capacity for that SLPR to 0 GB, or disable the license for all program products that are assigned to the SLPR. For more information, see ["Partitioning and Allocating Licensed Capacity to Storage Logical Partitions"](#) on page 30.
1. Access the Partition Definition window, and select an SLPR in the Partition Definition tree on the left side of the window to display the Storage Management Logical Partition window.
  2. In the Logical Partition tree on the upper left portion of the window, right-click the storage logical partition that you want to delete and click **Delete SLPR** from the pop-up menu.
  3. Click **Apply** to apply the settings, or click **Cancel** to cancel the settings.

## Cache Logical Partition Operations

The following items apply to CLPRs.

### **WARNINGS:**

- Before you start a partition reconfiguration make sure that you have enough cache memory assigned to a partition to support the disk storage assigned to that same partition. See ["Cache Logical Partition \(CLPR\)"](#) on page 10 for more information on the required amount of cache to support disk storage.
- As a general rule, you should perform cache logical partition operations either during the initial installation and setup or during a maintenance window, because cache logical partition operations can significantly degrade host performance. If you must perform such operations on a production machine, you should use XP Performance Monitor to verify that the write pending rate, including spikes, is well below 30%.

**Note:** Changes to CLPR/SLPR configurations may take hours to implement and cannot be aborted or modified until all changes have completed. For more information on XP Performance Monitor, see the *HP StorageWorks XP24000/XP20000 Performance Monitor User's Guide*. For assistance or for more information, contact your HP service representative.

cache logical partition operations have the following restrictions:

- You must have storage administrator access for all cache logical partition actions.
- If you have not yet created any cache logical partitions, all cache will belong to CLPR 0.

- Adding or changing CLPR definitions can require several hours or more.
- If you are using XP Continuous Access Journal, data and journal volumes can belong to the different CLPRs, but the journal volumes in the same journal group must belong to the same CLPR. For more information on XP Continuous Access Journal, see the *HP StorageWorks XP24000/XP20000 Continuous Access Journal Software User's Guide* and the *Hitachi Universal Replicator™ for Mainframe User's Guide: HP XP24000/XP20000 Disk Array* .

The following operations are not recommended with cache logical partitions:

- Creating LUSE volumes across multiple CLPRs.

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 **NOTE:**

If you forcibly perform this operation, the CLPR volumes included in the LUSE volumes cannot be used for HP StorageWorks XP Continuous Access Software or the for Mainframe pair volumes.

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- XP Business Copy Quick Restore operations that affect multiple CLPRs
- HP StorageWorks XP Auto LUN Software manual migration operations that affect multiple CLPRs
- Continuous Access Asynchronous or Asynchronous for Mainframe operations across CLPR boundaries. If these are allocated to the same consistency group, you cannot create a Continuous Access Asynchronous pair, and you cannot migrate a Continuous Access Asynchronous parity group to another CLPR.
- A parity group that contains LDEVs assigned to Cache Residency cache extents cannot be migrated to another CLPR

## Creating a Cache Logical Partition

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 **NOTE:**

To create a CLPR, the remaining cache size which is calculated by subtracting Cache Residency size from the cache size of CLPR 0 needs 8 GB or more.

---

To create a cache logical partition:

1. Access the Partition Definition window, and select an SLPR in the Partition Definition tree on the left side of the window to display the Storage Logical Partition window.
2. Right-click an SLPR from the Partition Definition tree, on the upper left portion of the window, to display the Create CLPR pop-up menu. Select **Create CLPR**. This will add a cache logical partition to the Partition Definition tree.
3. Select the newly created CLPR to display the Cache Logical Partition window. In the Detail for CLPR section, on the lower left portion of the window, do the following:
  - In the CLPR Name field, enter the name of the cache logical partition, in up to 16 alphanumeric characters.
  - In the Cache Size field, enter the cache capacity. You may select from 4 to 508 GB, in 2 GB increments. The default value is 4 GB. The size of the cache will be allocated from CLPR 0, but you must leave at least 8 GB remaining in CLPR 0.
  - In the Cache Residency Area field, enter the desired capacity for the Cache Residency area. You may enter the value within the range of 0 to 16384. The default value is 0.
4. Click **Apply** to apply the settings.
5. The change in cache capacity is reflected in this cache logical partition and in CLPR 0.



6. If you want to change the settings of an existing CLPR, repeat steps 3 through 5.

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 **NOTE:**

**Note:** At this point, the cache logical partition has no parity groups. See “[Migrating Resources To and From Cache Logical Partitions](#)” on page 33 for more information on migrating resources to and from cache logical partitions.

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## Migrating Resources To and From Cache Logical Partitions

**Notes:**

- You can only migrate resources within the same CU.
- All concatenated parity groups must be in the same CLPR.
- LUSE volumes cannot be set across more than one CLPR.
- If a parity group contains one or more LDEVs that have defined Cache Residency extents, you cannot migrate that parity group to another CLPR.

To migrate one or more parity groups to another cache logical partition:

1. Access the Storage Management Logical Partition window, then select a CLPR from the Partition Definition tree, on the upper left portion of the window. This opens the Cache Logical Partition window.
2. If you want to choose a CU, click the Select CU button on the upper right portion of the window to display the Select CU dialog box (see [Figure 17](#)). Within that dialog box, do one of the following:
  - Select the All CU radio button to display the information about all CUs on the CLPR resource list.
  - Select the Specific CU radio button, then specify the LDKC and the CU. This shows only CLPRs from the selected CU.
  - Select the Unallocated radio button to display only the information about CUs unallocated to CLPR can be displayed on the CLPR resource list.
3. Click **Set** to close the dialog box.
4. From the Cache Logical Partition Resource List on the upper right portion of the window, select one or more parity groups to be migrated. Right-click to display pop-up menu, then click **Cut**.
5. On the Partition Definition tree, on the upper left portion of the window, select the CLPR to which you want to migrate resources, then right click and click **Paste** from the pop-up menu.
6. Click **Apply** to apply the settings.

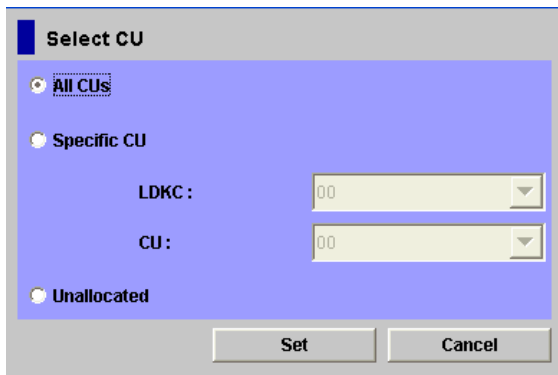


Figure 17 Selecting the CU

Table 11 Selecting the CU

Item	Description
<b>All CUs</b>	Displays the information for all CUs in the CLPR resource list.
<b>Specific CU</b>	Displays the information for specified CU in the CLPR resource list. <ul style="list-style-type: none"> <li>The LDKC drop-down list allows you to select the LDKC.</li> <li>The CU drop-down list allows you to select the CU.</li> </ul>
<b>Unallocated</b>	Displays the information for the unallocated CUs in the CLPR list.
<b>Set</b>	Implements the setting in the storage system.
<b>Cancel</b>	Cancels the setting.

## Deleting Cache Logical Partitions

Before you delete a cache logical partition, be sure to migrate any resources (for example, parity groups) to another CLPR. The CLPRs which are not necessary may be deleted, but CLPR 0 cannot be deleted.

To delete a cache logical partition:

1. Select a CLPR in the Partition Definition tree to open the Cache Logical Partition window.
2. Right-click the CLPR that you want to delete and click **Delete CLPR** in the pop-up menu.
3. Click **Apply** to apply the settings.

# 6 Troubleshooting

This chapter describes some troubleshooting methods if you have problems with Disk/Cache Partition.

- [General Troubleshooting](#), page 35
- [Displaying an Error Message](#), page 35
- [Troubleshooting Disk/Cache Partition](#), page 35
- [Calling HP Technical Support](#), page 36

## General Troubleshooting

- For troubleshooting information on the storage system, see the *HP StorageWorks XP24000 Disk Array Owner's Guide* or the *HP StorageWorks XP20000 Disk Array Owner's Guide*.
- For troubleshooting information on the XP Remote Web Console software, see the *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*.
- For information on the XP Remote Web Console software error codes, see the *HP StorageWorks XP24000/XP20000 Remote Web Console Error Codes*.

## Displaying an Error Message

To display an error message:

1. Right-click an SLPR on the Partition Definition tree, and then click **Error Detail** to open the message box.
2. Click **OK** to close the message window.

## Troubleshooting Disk/Cache Partition

Table 12 provides general troubleshooting instructions for XP Disk/Cache Partition operations.

**Table 12 General Troubleshooting for XP Disk/Cache Partition Operations**

Error	Corrective Action
All XP Disk/Cache Partition functions are not available	Only Storage administrators have access to XP Disk/Cache Partition functions.
The specified port cannot be migrated to other storage logical partition.	<ul style="list-style-type: none"><li>• Only Target ports on the same channel adapter can be migrated to another storage logical partition. Initiator ports, RCU Target ports and External ports cannot be migrated.</li><li>• Resources can only be migrated within the same CU.</li></ul>
A parity group cannot be migrated.	<ul style="list-style-type: none"><li>• Only open-system parity groups can be migrated.</li><li>• Resources can only be migrated within the same CU.</li></ul>

Error	Corrective Action
When you attempt to migrate a parity group to a CLPR in another SLPR, an LU warning message is displayed.	<ul style="list-style-type: none"> <li>• LUs in parity groups must remain within the same SLPR.</li> </ul>
When you attempt to migrate a CLPR to another SLPR or deleted that CLPR, an LU warning message is displayed.	<ul style="list-style-type: none"> <li>• LUs in parity groups must remain within the same SLPR.</li> </ul>
When you attempt to migrate a port to another SLPR, an LU warning message is displayed.	LUs that are associated with a port in a particular SLPR must stay within that SLPR.
When you attempt to migrate a parity group to another CLPR, an LU warning message is displayed.	LUSE volumes cannot be set across more than one CLPR.
When the port in an SLPR migrates to another SLPR, a warning message is displayed.	You are trying to allocate ports in a port block in High Speed mode to more than one SLPR. Check the port settings and make sure that all ports in the port block belong to the same SLPR.
The SLPR name cannot be changed.	You cannot assign the same name to more than one SLPR. The name you entered is already being used. Enter another name.
The CLPR name cannot be changed.	You cannot assign the same name to more than one CLPR. The name you entered is already being used or is reserved by a system. Enter another name.
The parity group in a CLPR cannot migrate to another CLPR.	<ul style="list-style-type: none"> <li>• Make sure that all concatenated parity groups belong to the same CLPR.</li> <li>• Make sure to click the Apply button when creating a new CLPR.</li> </ul>

## Calling HP Technical Support

If you need to call HP technical support, make sure to provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure
- The exact content of any error messages displayed on the host systems(s)
- The exact content of any error messages displayed by XP Remote Web Console
- The XP Remote Web Console configuration information (use the FD Dump Tool)
- The service information messages (SIMs), including reference codes and severity levels, displayed by XP Remote Web Console

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

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# 7 Support and Other Resources

## Related Documentation

- *HP StorageWorks XP24000/XP20000 Cache Residency Manager User's Guide*
- *HP StorageWorks XP RAID Manager User's Guide*
- *HP StorageWorks XP24000/XP20000 Data Retention Utility User's Guide*
- *HP StorageWorks XP24000/XP20000 LUN Expansion User's Guide*
- *HP StorageWorks XP24000/XP20000 LUN Manager User's Guide*
- *HP StorageWorks XP24000/XP20000 Performance Monitor User's Guide*
- *HP StorageWorks XP24000/XP20000 Auto LUN Software User's Guide*
- *HP StorageWorks XP24000/XP20000 Performance Control User's Guide*
- *HP StorageWorks XP24000/XP20000 Business Copy Software User's Guide*
- *Hitachi ShadowImage™ for Mainframe User's Guide: HP XP24000 Disk Array, HP XP20000 Disk Array*
- *HP StorageWorks XP24000/XP20000 Remote Web Console Error Codes*
- *HP StorageWorks XP24000/XP20000 Remote Web Console User's Guide*
- *HP StorageWorks XP24000/XP20000 Continuous Access Journal Software User's Guide*
- *HP StorageWorks XP24000/XP20000 Disk Array Owner's Guide*
- *HP StorageWorks XP24000/XP20000 Virtual LVI/LUN (VLL) and Volume Shredder User's Guide*

You can find these documents on the HP Manuals website:

<http://www.hp.com/support/manuals>

In the Storage section, click **Storage Software** and then select a product.

## Conventions for Storage Capacity Values

HP XP storage systems use the following values to calculate physical storage capacity values (hard disk drives):

- 1 KB (kilobyte) = 1,000 bytes
- 1 MB (megabyte) = 1,000<sup>2</sup> bytes
- 1 GB (gigabyte) = 1,000<sup>3</sup> bytes
- 1 TB (terabyte) = 1,000<sup>4</sup> bytes
- 1 PB (petabyte) = 1,000<sup>5</sup> bytes

HP XP storage systems use the following values to calculate logical storage capacity values (logical devices):

- 1 KB (kilobyte) = 1,024 bytes
- 1 MB (megabyte) = 1,024<sup>2</sup> bytes

- 1 GB (gigabyte) = 1,024<sup>3</sup> bytes
- 1 TB (terabyte) = 1,024<sup>4</sup> bytes
- 1 PB (petabyte) = 1,024<sup>5</sup> bytes
- 1 block = 512 bytes

## HP Technical Support

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

## Subscription Service

HP recommends that you register your product at the Subscriber's Choice for Business website:

<http://www.hp.com/go/e-updates>

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

## HP Websites

For additional information, see the following HP websites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/support/manuals>
- <http://www.hp.com/storage/spock>

## Documentation Feedback

HP welcomes your feedback.

To make comments and suggestions about product documentation, send a message to [storedocsFeedback@hp.com](mailto:storedocsFeedback@hp.com). All submissions become the property of HP.

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# A Acronyms and Abbreviations

**Table 13 Acronyms and Abbreviations**

CLPR	cache logical partition
CU	control unit
CV	customized volume
DASD	direct-access storage device
host group	Used to segregate hosts by operating system platform. Also known as a host storage domain.
LAN	local-area network
LDEV	logical device
LCP	local control port
LU, LUN	logical unit
LUSE	LUN Expansion
LVI	logical volume image
MB/s	megabytes per second
NAS	network-attached storage
NVS	nonvolatile storage
PCB	printed circuit board
RAID	Redundant array of independent disks. RAID 1 and RAID 5 are specific RAID architectures.
RCU	remote control unit
SAN	storage-area network
SIM	service information message
SLPR	storage logical partition
SSID	storage system ID
SVP	service processor

VLL	Virtual LVI/LUN
V-VOL	virtual volume
WWN	world wide name
XRC	extended remote copy
z/OS	IBM z/OS operating system



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