Overland Storage

SnapSAN™ Software Partitioning

User Guide

S3000/S5000

overland storage

Preface

This user guide explains how the SW (Software) Partitioning (hereinafter Partitioning) function manages disk array resources (disks, cache memory, ports) by dividing them into business or other logical units and constructing virtual storage that has independent resources. Virtual storage is known as partitions (VSPAR: Virtual Storage PARtition) in the partitioning function.This guide assumes that you are familiar with computer hardware, data storage, and network administration terminology and tasks. It also assumes you have basic knowledge of Internet SCSI (iSCSI), Serial-attached SCSI (SAS), Serial ATA (SATA), Storage Area Network (SAN), and Redundant Array of Independent Disks (RAID) technology.

This guide assumes that you are familiar with computer hardware, data storage, and network administration terminology and tasks. It also assumes you have basic knowledge of Internet SCSI (iSCSI), Serial-attached SCSI (SAS), Serial ATA (SATA), Storage Area Network (SAN), and Redundant Array of Independent Disks (RAID) technology.

Product Documentation and Firmware Updates

Overland Storage SnapSAN product documentation and additional literature are available online, along with the latest release of the SnapSAN 3000/5000 software.

Point your browser to:

http: //docs.overlandstorage.com/snapsan

Follow the appropriate link to download the **latest** software file or document. For additional assistance, search at http: //support.overlandstorage.com.

Overland Technical Support

For help configuring and using your SnapSAN 3000/5000, search for help at:

http: //support.overlandstorage.com/kb

You can email our technical support staff at techsupport@overlandstorage.com or get additional technical support information on the Contact Us web page:

http: //www.overlandstorage.com/company/contact-us/

For a complete list of support times depending on the type of coverage, visit our web site at:

http: //support.overlandstorage.com/support/overland_care.html

Conventions

This user guide exercises several typographical conventions:

Information contained in this guide has been reviewed for accuracy, but not for product

Convention	Description & Usage
Boldface	Words in a boldface font (**Example**) indicate items to select such as menu items or command buttons.
Ctrl-Alt-r	This type of format details the keys you press simultaneously. In this example, hold down the **Ctrl** and **Alt** keys and press the **r** key.
NOTE	A Note indicates neutral or positive information that emphasizes or supplements important points of the main text. A note supplies information that may apply only in special cases—for example, memory limitations or details that apply to specific program versions.
IMPORTANT	An Important note is a type of note that provides information essential to the completion of a task or that can impact the product and its function.
CAUTION	A Caution contains information that the user needs to know to avoid damaging or permanently deleting data or causing physical damage to the hardware or system.
WARNING	A Warning contains information concerning personal safety. Failure to follow directions in the warning could result in bodily harm or death.
Menu Flow Indicator (>)	Words in bold font with a greater than sign between them indicate the flow of actions to accomplish a task. For example, **Setup > Passwords > User** indicates that you should press the Setup button, then the Passwords button, and finally the User button to accomplish a task.

warranty because of the various environments, operating systems, or settings involved. Information and specifications may change without notice.

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Software Partitioning

Overview

The SW (Software) Partitioning (hereinafter Partitioning) function manages disk array resources (disks, cache memory, ports) by dividing them into business or other logical units and constructing virtual storage that has independent resources.

Virtual storage is known as partitions (VSPAR: Virtual Storage Partition) in the partitioning function.

If, for example, multiple businesses are united by one disk array, constructing partitions by business makes the multiple businesses that share the disk array operate stably by making it possible to prevent effects on performance between businesses and to minimize influences by operation errors. At the same time, it makes it possible to use and manage the disk array efficiently.

Figure 1-1: Partitioning Function Overview
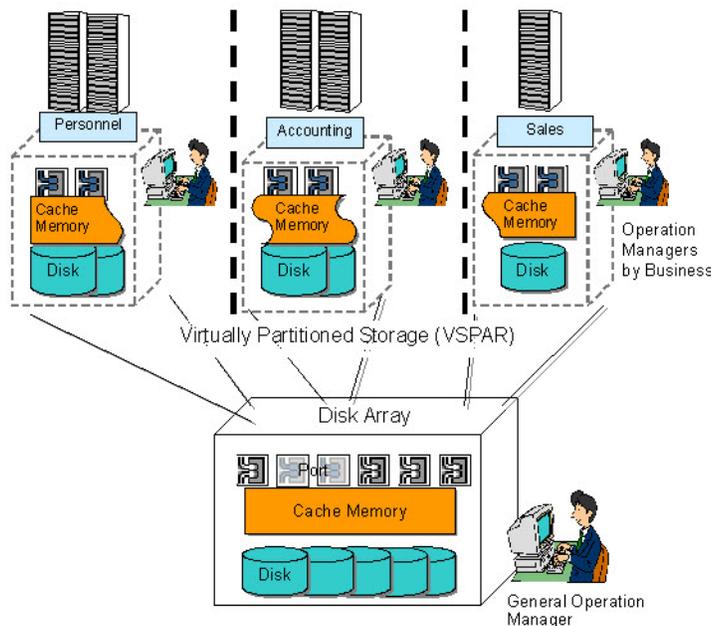
Installing the partitioning function and operating after dividing a disk array into multiple partitions results in stabilized performance of each business.

Ensured Stable Performance of Main Business

Allocating partitions by business ensures stabilized performance of each business by minimizing effects on performance between businesses, whether due to the load from an increased volume of data handled by a business or due to interference among businesses. Moreover, allocating a new partition when adding a new business makes it possible to add the business while the performance of the existing businesses is maintained.

Decentralization of Operations Management Tasks

The operation manager of the disk array as a whole can set operation managers for each business (operation managers for each partition). Since the resources managed are limited to those within the partition, erroneous operations on disk array resources on which each business operation manager has no right to operate can be prevented.

Moreover, the work load of the manager who manages the overall operation of a disk array in a large-scale system can be distributed by establishing an operation manager for each business.

Resource Expansion Depending on Business Expansion

When it becomes necessary to increase the capabilities of a disk array due to the addition of a new business or business expansion, they can be extended dynamically without suspending operations just by expanding any resources that need to be added. Furthermore, it is possible to freely and dynamically add or change the allocation of resources within a disk array by partition, making it possible to cope flexibly with business characteristics.

Application Example of Partitioning

An example of applying the partitioning function is shown below.

Ensuring Stable Performance of Main Business

Allocating partitions by business has the effects shown below.

- Ensured stable performance of main business
- Influences of other businesses (such as batch, backup, and development work) of the main business such as the actual online work can be minimized, which ensures stable performance of the main business.
- Minimization of interference with performance between businesses
- Allocating a new partition when adding a new business such as storage integration makes it possible to add the business while the performance of existing businesses is maintained.

The figure below illustrates allocating partitions by business.

Allocate partitions and exclusive resources to each of development work, actual business, and backup.

The actual business operates stably and without being influenced by loads due to development work or backup.

Allocate new partitions and exclusive resources to businesses being added. Businesses can be added while maintaining the usual performance of existing development work, actual business, and backup.
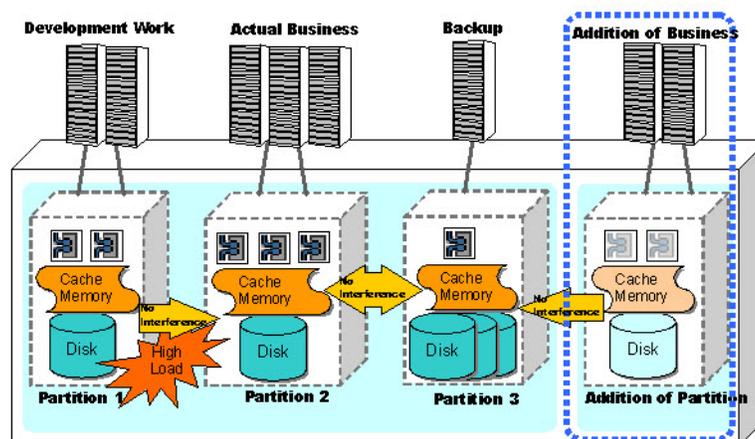
Figure 1-2: Distribution of Operation Management Tasks

Assigning an operation manager to each partition has the effects shown below.

In the partitioning function, the operation manager of each partition is known as the partition user and the operation manager of the disk array as a whole is known as the storage group user.

- Distribution of operation management tasks

  Allocating partitions and partition users by business makes operation management by business unit possible and allows distributing and reducing the load of operation management tasks conventionally performed by the operation manager of the disk array as a whole.

- Prevention of erroneous operations on resources of other businesses

  Since what a partition user manages is limited to what is in the partition allocated by the operation manager, it is possible to prevent erroneous operations on disk array resources for which the user has no operation authority, such as resources of other businesses.

  The figure below illustrates setting operation managers by partition.

- The SnapSAN Manager entrusts operation management tasks of a partition to a partition user.

- The partition user performs operation management of the partition for which authority was given.

- Partition users never manipulate resources of partitions for which they have no authority or resources not allocated to partitions.
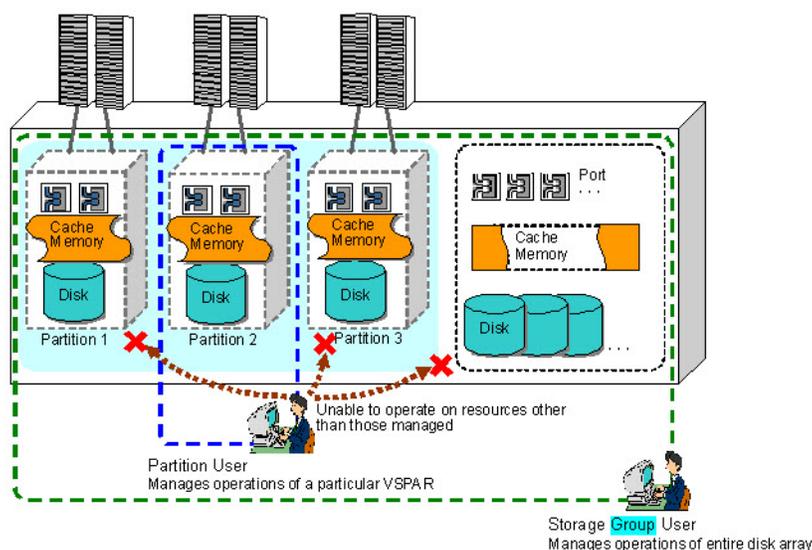
Figure 1-3: Setting Operation Managers by Partition

Extension of Resources in Conjunction with Business Expansion

In the past, there were problems such as installing a disk array to suit the current scale of business and having to switch to a high performance, large capacity disk array when it was unable to cope with a subsequent drastic enlargement of business, or installing one by securing more resources than necessary in advance in anticipation of future enlargement of the business and thereby increasing the initial investment.

Introducing the partitioning functions makes it possible to allocate resources in disk arrays (disks, cache memory, ports) at will in response to the volume for each business and without stopping the business, which has the effects shown below.

- Less useless investment
- After installing a disk array with a resource configuration suited to the current business scale, arbitrary resources can be added efficiently in conjunction with subsequent increases in business volume.
- Resources increased to suit configuration and use
- Resources can be increased flexibly to suit the system configuration or use, such as by adding ports when wishing to increase the number of host connections and adding disks when wishing to expand the data capacity, making it possible to cope effectively with business characteristics and scale.

The figure below illustrates extending resources and allocating them to partitions.

- When resources are to be added within a partition, the necessary resources can be allocated from unallocated resources. It is not necessary to stop work when doing so.
- Resources within a partition that has become unused can be deleted from the partition and returned as unallocated resources. It is not necessary to stop work when doing so.
- Needed resources can be extended when they are needed, with business and the disk array running.
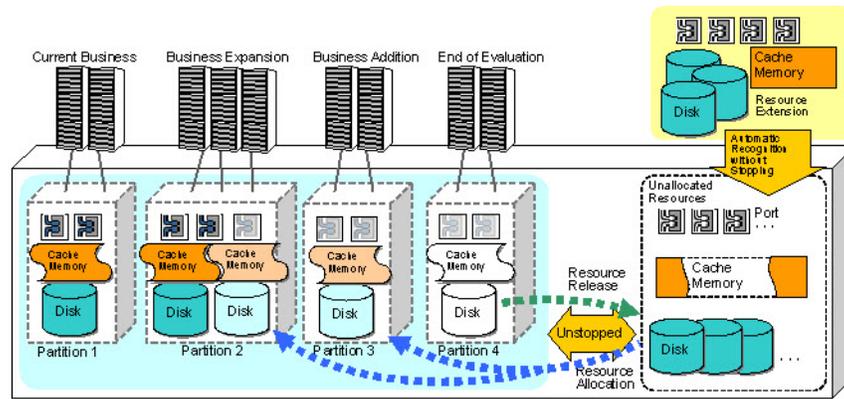
Figure 1-4: Resource Extension and Allocation

Function

Overview

This section explains the basic concepts and terminology of partitioning.
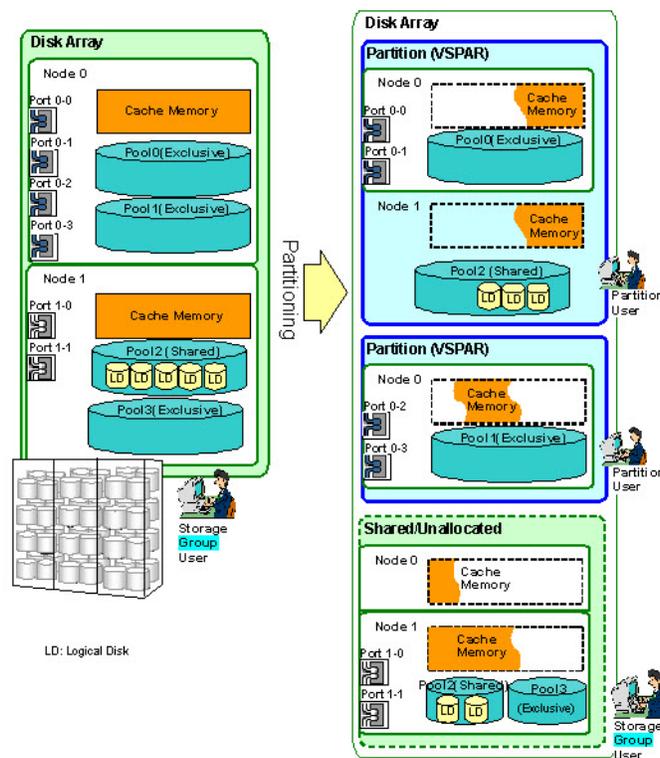
Figure 2-1: Two Nodes

This is an example in which a disk array is configured with 2 nodes.

*Cache memory is implemented for each node and cache memory and the logical disks that use it are independent for each node.

User Roles

In the partitioning function, users can be established for each partition created.

Storage Group Users

A user who performs operation management of the disk array as a whole is known as a storage group user. Storage group users have user roles and are capable of the operations below.

Role	Description
Monitor	Capable of disk array monitoring, status display, or other reference
Operator	Capable of operations that are necessary for operating with data replication, snapshot, performance monitoring, performance optimization, and WORM functions
Administrator	Capable of all operations, including disk array configuration setting

Partition Users

A user who performs operations management of specific partitions is known as a partition user. A partition user is granted operation authority for a specific partition by a storage group user. Partition users also have user levels similar to those of storage group users and are capable of the operations below on partitions for which they are granted operation authority.

It is not necessary to set a different partition user for each partition. One partition user can perform operation management of multiple partitions for multiple disk arrays. Moreover, if partition users are not needed for operation, the storage group user can also take responsibility for operation management of partitions.

Role	Description
Monitor	Capable of monitoring, status display, or other referencing of resources allocated to a partition
Operator	In addition to operations available for a monitor, capable of operations on resources allocated to a partition that are necessary for operating with data replication and snapshot functions
Administrator	In addition to operations available for a monitor or operator, capable of configuration setting operations on resources allocated to a partition

Functions such as performance monitoring and WORM that require operation management of the disk array as a whole cannot be operated by a partition user. Have the storage group user perform these functions.

Partitions (VSPAR)

The partitioning function constructs multiple partitions (VSPAR) by logically dividing the resources implemented in a disk array.

Nodes and Node Numbers

For a disk array with nodes, one disk array can be configured in multiple cabinets (made up of controller and disk enclosures), each of which is known as a node. Extending nodes in response to business expansion or increased data volume makes it possible to expand disk drives, cache memory, ports, and other hardware resources.

A node number specifying the node is given to each node, and the node is identified by this node number. In addition, for the various resources implemented in a disk array with nodes, the nodes that are their physical implementation locations are identified by node numbers.

Partitions (VSPAR)

A unit of VSPAR (Virtual Storage PARtition) which is a virtual storage to which with some of the resources are allocated after logically dividing the resources implemented in a disk array is known as a partition.

The resources that can be allocated to a partition are pools, logical disks, cache memory, and ports.

If a disk array is made up of multiple nodes, the resources of each node can be allocated to one partition.

Refer to the following explanations for characteristics of each resource allocated to a partition.

The operation that creates a new partition is known as partition creation and the operation that deletes a created partition is known as partition deletion.

Moreover, the operation that modifies the resource allocation or other settings for a created partition is known as partition modification.

Partition Name

A partition can be given a nickname in order to facilitate partition management. This nickname is known as the partition name.

The naming rules for partition names are as follows.

- Characters that can be used

  Single-byte alphanumeric, underbar ("_"), and slash ("/") characters can be specified.

- Maximum number of characters

  Up to 32 characters can be specified.

- Recommended setting

  It is recommended that a name from which the business corresponding to a partition can be identified be set.

Pool and Logical Disk

Disks that have been implemented in the disk array are allocated to a partition by pool or by logical disk (allocation by pool and allocation by logical disk can be mixed). This operation is known as disk allocation.

At least one pool or logical disk must be allocated to a partition.

Pools and logical disks are exclusive resources of each partition and cannot be allocated in such a way that the same pool or same logical disk is shared by multiple different partitions.

A pool that can be allocated to a partition is referred to as an exclusive pool (that can be exclusively used by the partition), while a pool that includes a logical disk that can be allocated to a partition is referred to as a shared pool (the logical disks in the pool can be individually used in multiple partitions). The attribute of exclusive pool and shared pool can be set at pool binding. It can be mutually converted after binding, too.

For allocating an exclusive pool to a partition, if a logical disk has been bound to the exclusive pool and the logical disk has already been assigned to an LD Set, the LD Set to which the logical disk of this pool is assigned is also allocated to the same partition accompanying allocation of the exclusive pool. If logical disks bound on multiple exclusive pools have been assigned to the same LD Set, every one of those pools must be allocated to the same partition.

For allocating a logical disk in a shared pool to a partition, if the logical disk has already been assigned to an LD Set, the LD Set to which the logical disk is assigned is also allocated to the same partition accompanying allocation of the logical disk. If multiple logical disks have been assigned to the same LD Set, every one of those logical disks must be allocated to the same partition.

If a disk array is made up of multiple nodes, pools are bound independently by node. A pool cannot be bound in such a way that it extends over multiple nodes.

Cache Memory

Cache memory that is implemented in a disk array can be allocated to a partition by cache segment. This operation is known as cache segment allocation.

Port

Ports that have been implemented in a disk array can be allocated to a partition. This operation is known as port allocation.

A partition can exclusively use a port that is allocated to the partition. In this case, the port access mode must have been set to Port mode by the Access Control function.

A port that has been set to WWN mode cannot be allocated to a partition, since it is a shared resource of the entire disk array. If a port is shared by multiple partitions or disk arrays, a port that has been set to WWN mode is used without being allocated to a partition.

If a port for which link setting was done already as LD Set path information is allocated to a partition, every one of the ports for which links were set to that LD Set must be allocated to the same partition.

If a disk array is made up of multiple nodes, it is possible to allocate a port of any node to a partition or to mix ports of multiple nodes and allocate any of them, and it also is possible to access a logical disk that is bound to a different node from the node at which the port is mounted.

Cache Segments

The partitioning function logically divides cache memory implemented in a disk array and allocates it to each partition
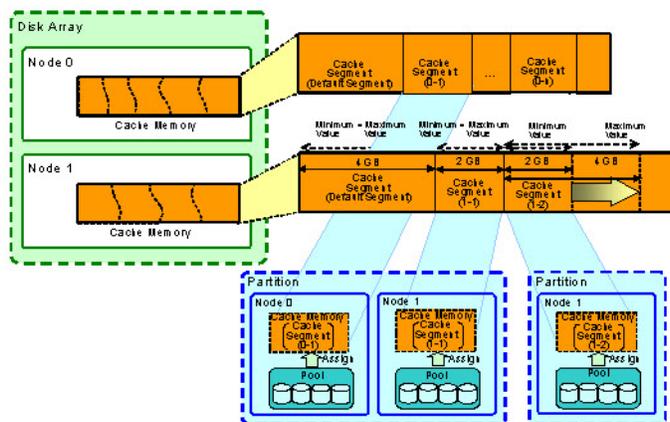

Figure 2-2: Cache Segments

When a disk array consists of multiple nodes, cache memory is implemented by node and cache segments are defined by node. In addition, only a logical disk (pool) within the same node can be assigned for the area of a defined cache segment. Although cache segments, pools, and logical disks of each node can be allocated to a partition, cache segments and the logical disks that are assigned to them are independent for each node. Cache segment in the partition cannot be used by logical disks of different nodes or otherwise shared between nodes.

Cache Segments

A unit of the area into which cache memory that is implemented in a disk array is divided is known as a cache segment.

A cache segment that is used exclusively by one partition is known as an exclusive cache segment. Moreover, a cache segment that is used by being shared by multiple partitions or logical disks not allocated to a partition is known as a default segment or shared cache segment.

The operation that makes a new cache segment is known as cache segment definition, and the operation that deletes a defined cache segment is known as cache segment deletion.

In addition, the operation that modifies settings such as allocated capacity for a defined cache segment is known as cache segment modification.

Cache Segment Number and Cache Segment Name

To facilitate the management of cache segments, a number and nickname can be given to a cache segment. This number is known as a cache segment number and the nickname is known as a cache segment name.

A cache segment can be identified by a node number that specifies a node within a disk array and the cache segment number and cache segment name that are the cache segment identifiers.

The naming rules for cache segment names are as follows.

- Characters that can be used

    Single-byte alphanumeric, underbar ("_"), and slash ("/") characters can be specified.

- Maximum number of characters

    Up to 16 characters can be specified.

- Recommended setup

    It is recommended that a name from which the business corresponding to a cache segment can be identified be set.

Default Segment (Shared Cache Segment)

The cache segment that has the lowest cache segment number (= 00h) is known as the default segment or shared cache segment. The default segment differs from other cache segments as follows.

- It is always defined.
- The default segment cannot be deleted.
- A default segment is allocated when a cache segment allocated to a partition is made shared.
- The logical disks below are assigned to the default segment and share use of the cache segment (default segment).

    - Logical disks of partitions for which cache segments are set to shared

- Logical disks not belonging to partitions

When a disk array consists of multiple nodes, the default segment is also created by node. Therefore, logical disks sharing the default segment can only be assigned to the logical disk in the same node. They are independent for each node.

Allocated Capacity of Cache Segment

When defining a cache segment, specifying the capacity available in the cache memory sets so that it will not use more cache memory than the capacity specified. The capacity that is specified here is known as the cache allocated capacity.

The cache allocated capacity is determined by referring to the ratio of logical disk capacity while considering the priority of accessing the logical disk. The ratio of logical disk capacity is the ratio of the total logical disk capacity allocated to cache segments to the total logical disk capacity over the entire disk array.

The cache allocated capacity can be set in units of 0.25 GB starting from a minimum of 1 GB.

Minimum Capacity and Maximum Capacity

There is a minimum capacity and a maximum capacity for the allocated capacity of a cache segment.

- Minimum capacity (Minimum value)

  The minimum capacity is the lowest capacity that is allocated to a cache segment. The range that can be set is as follows.

  Minimum value: 1 GB

- Maximum value: Value from the computational expression below.

  Maximum value = (Total capacity) – (Sum of minimum capacities) – (Maximum value of capacity difference)

Total Capacity

This is the total capacity of allocatable cache memory, which can be confirmed from Available Cache Capacity of the "Cache Segment Setting" screen.

Sum of Minimum Capacities

This is the value from adding all of the minimum capacities that have been set for the cache segments that were defined.

Maximum Value of Capacity Difference

This is the greatest capacity difference among the capacity differences (maximum capacity – minimum capacity) of the maximum capacity and minimum capacity that have been set for each cache segment that was defined.

- Maximum capacity (Maximum value)

  The maximum capacity is the greatest capacity that can be used as a cache segment. The range that can be set is as follows.

  Minimum value: 1 GB

  Maximum value: Value from the computational expression below.

  Maximum value = (Total capacity) – (Sum of minimum capacities)

Total Capacity

This is the total capacity of allocatable cache memory, which can be confirmed from Available Cache Capacity of the "Cache Segment Setting" screen.

Sum of Minimum Capacities

This is the value from adding all of the minimum capacities that have been set for the cache segments that were defined.

Fixed Cache Capacity Allocation and Variable Cache Capacity Allocation

These are policies for setting the allocated capacity of cache segments.

- Fixed Cache Capacity Allocation

  Fixed cache capacity allocation is a method of setting the allocated capacity of a cache segment using "Minimum capacity = Maximum capacity". It always allocates a fixed amount of cache memory to each business to minimize effects on other businesses.

- Variable Cache Capacity Allocation

  Variable cache capacity allocation is a method of setting the allocated capacity of a cache segment using "Minimum capacity < Maximum capacity". When access loads differ by time period for each business, this draws the maximum performance in high load time periods for each business.

Partitioning Function Operations

This section provides an overview of functions and operations for installing the partitioning function and operating partitions.

Referencing Partition Information

A list of the partitions in a disk array, and configuration information and resource status for each partition are displayed in the SnapSAN Manager main window of the SnapSAN Manager client according to the user level (operation authority) of the user who connected to the SnapSAN Manager server and logged in.

A list of the partitions in a disk array, and configuration information and resource status for each partition can be displayed by using the iSMview command or output to a file by using the iSMcsv command as well.

Setting Partition Users

It is possible to set partition users as operation managers by partition.

Partition users can be created, edited, and deleted by starting the "User Setting" screen.

1. Creating partition users

   A partition user is created by setting the user name, password, and user level of the partition user.

   The relationship between the partition user that was created and the partition to be managed is made in the partition creation or partition modification operation.

2. Editing partition users

   User name, password, and user level settings can be changed by selecting any partition user from the user list.

3. Deleting partition users

   Any partition user can be selected from the user list and deleted.

Creating, Modifying, and Deleting Partitions

Partitions can be created, modified, or deleted by starting the "Partition Information List" screen.

(1) Creating partitions

- Partitions are created in wizard mode using the partitioning wizard.
- Partition names can be given.
- Partition users can be allocated.
- Pools (exclusive pools) and logical disks (logical disks in shared pools) can be allocated.
- By converting an exclusive pool to a shared pool, it can be used for allocating logical disks.
- Cache segments can be allocated.

Either of the methods below can be selected for cache segment allocation.

- Allocate a segment shared with other partitions (default segment).
- Allocate an exclusive cache segment.

An exclusively allocated cache segment can be defined, modified, or deleted by starting the "Cache Segment Setting" screen.

- Ports can be allocated.

(2) Modifying partitions

Any partition can be selected from the partition list and modified in wizard mode using the partitioning wizard.

- Partition names can be modified.
- Partition users can be added or deleted.
- Allocations of pools (exclusive pools) and logical disks (logical disks in a shared pool) can be added or deleted.
- By converting an exclusive pool to a shared pool, it can be used for allocating logical disks.
- Cache segment allocations can be added or deleted.

Either of the methods below can be selected for cache segment allocation.

- Allocate a segment shared with other partitions (default segment).
- Allocate an exclusive cache segment.

An exclusively allocated cache segment can be defined, modified, or deleted by starting the "Cache Segment Setting" screen.

- Port allocations can be added or deleted.

(3) Deleting partitions

Any partition can be selected from the partition list and deleted.

Defining, Modifying, and Deleting Cache Segments

Cache segments allocated exclusively by partition can be defined, modified, or deleted by starting the "Cache Segment Setting" screen.

(1) Defining cache segments

A cache segment is defined by setting the following items.

- Select the node number of the node at which to define the cache segment.
- Select the segment number of the cache segment.
- A cache segment name can be given.
- A maximum capacity and minimum capacity can be set for the cache segment.

(2) Modifying cache segments

Any cache segment can be selected from the cache segment list and its settings modified.

- The cache segment name can be modified.
- The maximum capacity and minimum capacity of the cache segment can be modified.

(3) Deleting cache segments

Any cache segment can be selected from the cache segment list and deleted.

Installation

System Configuration

An example of the configuration of hardware devices and software for using the partitioning function is shown below.
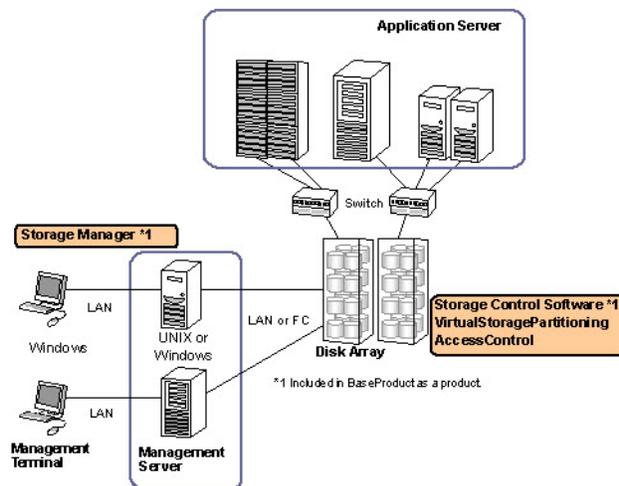
Figure 3-1: System Configuration - Installation

Related Products

Besides VirtualStoragePartitioning, the following related program products are required when using the partitioning function.

- Storage control software

  Storage control software controls the disk arrays.

  Storage control software is included in BaseProduct.

- SnapSAN Manager

  SnapSAN Manager provides functions such as monitoring the status and setting the configuration of resources in a disk array.

  SnapSAN Manager is included in BaseProduct.

- AccessControl

  AccessControl provides functions that set the logical disks that can be accessed by each application server.

  AccessControl is included in BaseProduct.

Software Installation

This section explains how to install the SnapSAN Manager and VirtualStoragePartitioning.

Software	Installation Destination
SnapSAN Manager (SnapSAN Manager server)	Management Server
SnapSAN Manager (SnapSAN Manager client)	Management Terminal
Storage Control Software	Disk array
VirtualStoragePartitioning	
AccessControl	

SnapSAN Manager Installation

Installation involves the following:

- Operating System where the software runs
- Free disk space needed to install the software
- Amount of memory needed to use the software
- Installation software needed for the installation procedure
- Uninstallation software needed for the uninstallation procedure
- Updating software needed to update

Unlocking the VirtualStoragePartitioning License

VirtualStoragePartitioning is software that operates on disk arrays for which the partitioning function is implemented.

After purchasing a disk array product, the license on the disk array must be unlocked. Unlocking the license makes the function of VirtualStoragePartitioning available.

SnapSAN Manager must be installed in order to use the function of VirtualStoragePartitioning.

Operations

Setting Users

In order to install the partitioning function, a storage group user whose role is administrator must be registered.

Although operations can also be performed by a storage group user when operating each partition, setting partition users by partition is recommended.

Moreover, partition users must be set as needed to establish the operation manager of a partition when operating each partition.

```
Step 1. Register storage group users
        ↓
Step 2. Unlock license
        ↓
Step 3. Set partition users
```
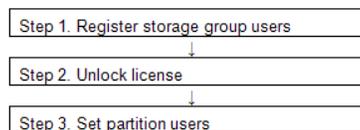
1. Register storage group users

   Storage group users must be registered in SnapSAN Manager server environment setup.

   The operations below for operating the partitioning function can only be performed by a storage group user whose role is administrator. Register a storage group user who is capable of these operations in advance in SnapSAN Manager server environment setup.

   • Setting users (creating, editing, and deleting partition users)

   • Creating, modifying, and deleting partitions

   • Defining, modifying, and deleting cache segments

2. Unlock license

   Using the Setting Disk Array operation of the configuration setting, unlock the license of VirtualStoragePartitioning.

3. Set partition users

   When an operation manager is set to a partition for each business and the like, a partition user to allocate to the partition is set as needed in advance of partition creation or modification operations.

   The setting of partition users is performed by a storage group user whose role is administrator by starting the "User Setting" screen. A partition user must be given operation authority as administrator in order to perform configuration setting operations (such as binding logical disks, setting LD, and assigning logical disks) for resources allocated to a partition.

Setting Partitions

Considerations in Resource Allocation

Broadly speaking, there are two considerations for the way that resources (pools, logical disks, cache segments, ports) are allocated to partitions when binding and operating partitions.

To ensure stable performance of the business

If stable performance is to be ensured by stressing the operating efficiency of businesses, partitions are created by business and one business is run within a partition. Resources that a specific business uses exclusively are allocated to the partition.

- For pools, allocate pools (exclusive pools) that the specific business uses exclusively.
- For cache segments, allocate exclusive cache segments of allocations of a fixed cache capacity. Always using cache memory of a set capacity minimizes interference between businesses to ensure stable performance.
- For ports, allocate Port mode ports and connect only hosts of the specific business.

Since a specific business within a partition uses resources exclusively, performance interference due to resource contention between businesses can be minimized. It also is possible to add and allocate needed resources when they are needed for business expansion or a load increase.

- To use the disk array resources efficiently

There are two considerations to efficiently use the resources to be allocated to partitions. One is the method for allocating logical disks to a partition. The partitions are divided by business and the disk capacity can also be used efficiently. The other is the method for allocating pools to a partition to run multiple businesses within a partition. Select either of them according to the characteristics of each business.

<For effective use by allocation in units of logical disks>

The resources within a disk array can be efficiently used by allocating logical disks to a partition. Compared to the method for efficient use by allocation in units of pools to be mentioned later, this method can divide the partitions by business and is superior in terms of prevention of operational error within a partition and ensuring security.

- Allocate logical disks to a partition.
- For cache segments, allocate default segments (shared cache segments) or cache segments of allocations of variable cache capacity.

If access loads differ for each business in a time period, making cache segments allocations of variable cache capacity uses cache memory effectively by securing cache memory of the minimum capacity and autonomously changing the allocated capacity up to the maximum capacity in accordance with the load of each business.

- For ports, use WWN mode ports and connect multiple hosts.

Since the disk capacity is allocated to the partitions in units of logical disks, the pools can be used effectively. If the logical disk capacity being used is insufficient, it is also possible to add and allocate needed resources when they are needed or expand the capacity.

<For effective use by allocation in units of pools>

For efficiently using the resources within a disk array by allocating pools to a partition, multiple businesses are run within a partition. Together with allocating resources jointly used by multiple businesses to a partition, shared resources of the entire disk array are also used.

For pools, allocate pools to be jointly used by multiple businesses. Within a partition, bind logical disks of necessary capacities from pools as needed for use by each business within the partition.

For cache segments, allocate default segments (shared cache segments) or cache segments of allocations of variable cache capacity.

If access loads differ for each business in a time period, making cache segments allocations of variable cache capacity uses cache memory effectively by securing cache memory of the minimum capacity and autonomously changing the allocated capacity up to the maximum capacity in accordance with the load of each business.

For ports, use WWN mode ports and connect multiple hosts.

Since resources are jointly used by multiple businesses, pool and cache segment capacities and mounted ports can be used effectively. It also is possible to add and allocate needed resources when they are needed if jointly used resources are insufficient.

Operation Examples

This section describes the following four operation examples using the partitioning function.

Initial installation

An example of operations to install the partitioning function on initial installation of a disk array is shown below.
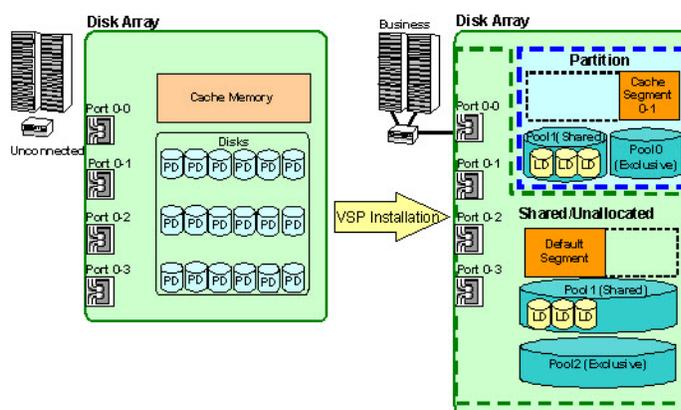

Figure 4-1: Initial Installation

The operations below should be carried out by a storage group user whose role is administrator.

It is assumed that the licenses of the related products including AccessControl have already been unlocked at the disk array initial setting.
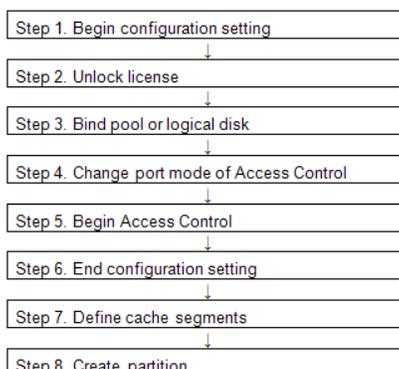
Figure 4-2: Initial Installation Flow

4. Select the disk array for which to install the partitioning function in the SnapSAN Manager client (Web GUI) main window and start [Configuration Setting] to begin setting the configuration.

5. Unlock license

   Unlock the VirtualStoragePartitioning license using the Setting Disk Array operation of configuration setting.

6. Bind pool or logical disk

   Start the pool binding wizard using the LD Individual Bind/Unbind operation of configuration setting and bind the pool to be allocated to a partition (exclusive pool) or the pool jointly used within a partition (shared pool) of which logical disks are allocated to the partition.

   By using the LD Individual Bind/Unbind operation of configuration setting, also bind the logical disks from the shared pool as needed.

   The binding of logical disks to a bound pool (exclusive pool) is carried out by a storage group user whose role is administrator or partition user after the pool is allocated.

   The binding of logical disks to a shared pool is carried out only by a storage group user whose role is administrator.

7. Change port mode of Access Control

   To allocate a port to a partition, the access mode of that port must be Port mode.

   Perform Change the Mode of Port using the Setting Access Control operation of configuration setting to change the access mode of the port to be allocated to Port mode.

   Since a port that is set to WWN mode is a shared resource of the entire disk array, it cannot be allocated to a partition.

   When a port is set to WWN mode, the port is used without allocating it to a partition.

8. Begin Access Control

   Begin Access Control using the Setting Access Control operation of configuration setting.

Access Control setup such as setting LD Sets and assigning logical disks is carried out by a storage group user whose role is administrator or partition user after creating partitions.

To monitor a disk array from SnapSAN Manager server via FC connection, prior to starting Access Control, the tasks below must already be finished for the disk array and it must be in a state in which logical disks can be recognized by the management server on which SnapSAN Manager server is installed.

- Creation of LD Set for management server
- Setting a link between the LD Set of management server and path information
- Assignment of logical disks to LD Set of management server

9. End configuration setting

Terminate configuration setting.

10. Define cache segments

If you wish to use the cache memory used by a partition exclusively without influence or interference from other businesses, define an exclusive cache segment and allocate it to the partition. Perform cache segment definition by starting the Cache Segment Setting function.

The allocated capacity of a cache segment can be adjusted later while checking the ratio of total capacity of logical disks assigned to the cache segment.

If it is not necessary for the cache memory used by a partition to be used exclusively by that partition, use a shared cache segment (default segment) within the node. If you allocate a default segment to a partition, you need not define a cache segment.

While Cache Segment Setting is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate Cache Segment Setting.

11. Create partition

Create a partition by starting the partitioning wizard.

At that time, allocate partition users and pool, logical disk, cache segment, and port resources to the partition as needed. The partition users must have been created before creating the partition.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

Hereafter, configuration setting operations on resources in the partition can be performed by the storage group user whose role is administrator or the partition user whose role is administrator who was given operation authority for the partition that was created.

Perform LD Binding and Setting Access Control for the created partition.

- LD Binding

  Bind logical disks to a pool allocated to a partition.
- Setting Access Control

  Specify the subject partition and create an LD Set.

  Set a link between the LD Set created and path information.

  Assign logical disks to the LD Set created.

Post-installation (Applying Partitions to New and Existing Businesses)

The figure below shows an operation example for installing the partitioning function after the fact for a disk array with which a business is already working and applying partitions to the existing business and a newly added business. Installation of the partitioning function can be done with the existing business continuing to operate without stopping its work.
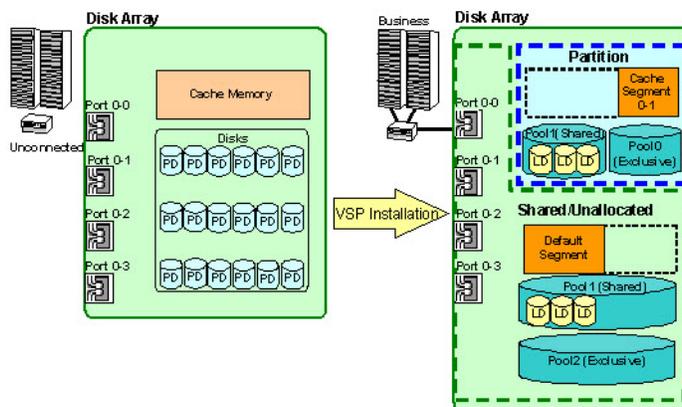
Figure 4-3: Installation During Operation

The operations below should be carried out by a storage group user whose role is administrator.

It is assumed that the licenses of the related products including AccessControl have already been unlocked at the disk array initial setting.

Figure 4-4: Initial Installation - Unlocked Licenses Flow

1. Begin configuration setting

   Select the disk array for which to install the partitioning function in the SnapSAN Manager client (Web GUI) main window and start [Configuration Setting] to begin setting the configuration.

2. Unlock license

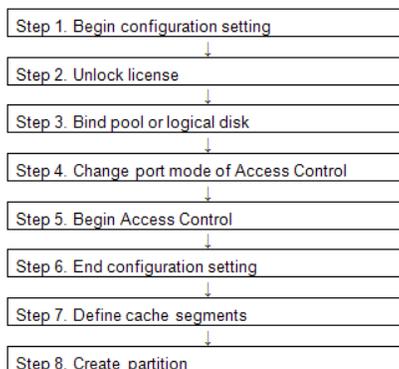Unlock the VirtualStoragePartitioning license using the Setting Disk Array operation of configuration setting.

3. Bind pool or logical disk

Start the pool binding wizard using the LD Individual Bind/Unbind operation of configuration setting and bind the pool to be allocated to a partition (exclusive pool) or the pool jointly used within a partition (shared pool) of which logical disks are allocated to the partition.

By using the LD Individual Bind/Unbind operation of configuration setting, also bind the logical disks from the shared pool as needed.

The binding of logical disks to a bound pool (exclusive pool) is carried out by a storage group user whose role is administrator or partition user after the pool is allocated.

The binding of logical disks to a shared pool is carried out only by a storage group user whose role is administrator.

4. Change port mode of Access Control

To allocate a port to a partition, the access mode of that port must be Port mode.

Perform Change the Mode of Port using the Setting Access Control operation of configuration setting to change the access mode of the port to be allocated to Port mode.

Since a port that is set to WWN mode is a shared resource of the entire disk array, it cannot be allocated to a partition.

When a port is set to WWN mode, the port is used without allocating it to a partition.

5. Begin Access Control

Begin Access Control using the Setting Access Control operation of configuration setting.

Access Control setup such as setting LD Sets and assigning logical disks is carried out by a storage group user whose role is administrator or partition user after creating partitions.

To monitor a disk array from SnapSAN Manager server via FC connection, prior to starting Access Control, the tasks below must already be finished for the disk array and it must be in a state in which logical disks can be recognized by the management server on which SnapSAN Manager server is installed.

- Creation of LD Set for management server
- Setting a link between the LD Set of management server and path information
- Assignment of logical disks to LD Set of management server

6. End configuration setting

Terminate configuration setting.

7. Define cache segments

If you wish to use the cache memory used by a partition exclusively without influence or interference from other businesses, define an exclusive cache segment and allocate it to the partition. Perform cache segment definition by starting the Cache Segment Setting function.

The allocated capacity of a cache segment can be adjusted later while checking the ratio of total capacity of logical disks assigned to the cache segment.

If it is not necessary for the cache memory used by a partition to be used exclusively by that partition, use a shared cache segment (default segment) within the node. If you allocate a default segment to a partition, you need not define a cache segment.

While Cache Segment Setting is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate Cache Segment Setting.

8. Create partition

Create a partition by starting the partitioning wizard.

At that time, allocate partition users and pool, logical disk, cache segment, and port resources to the partition as needed. The partition users must have been created before creating the partition.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

Hereafter, configuration setting operations on resources in the partition can be performed by the storage group user whose role is administrator or the partition user whose role is administrator who was given operation authority for the partition that was created.

- LD Binding

  Bind logical disks to a pool allocated to a partition.

- Setting Access Control

  - Specify the subject partition and create an LD Set.

  - Set a link between the LD Set created and path information.

  - Assign logical disks to the LD Set created.

The figure below shows an operation example for installing the partitioning function after the fact for a disk array with which a business is already working and applying partitions to the existing business and a newly added business. Installation of the partitioning function can be done with the existing business continuing to operate without stopping its work.
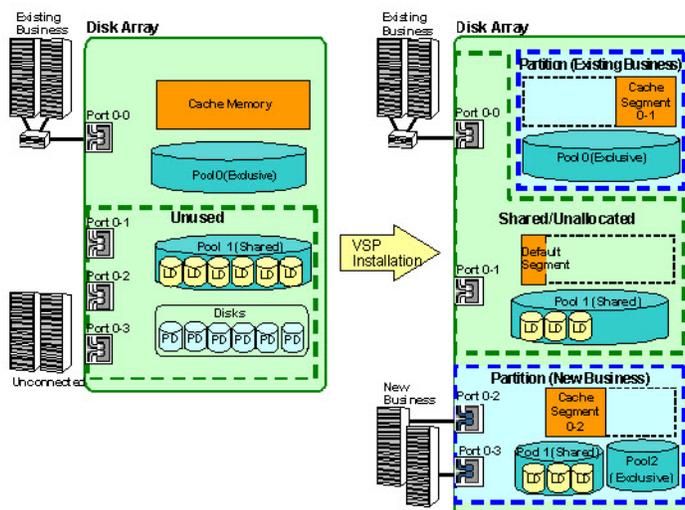

Figure 4-5: Post Installation

The operations below should be carried out by a storage group user whose role is administrator
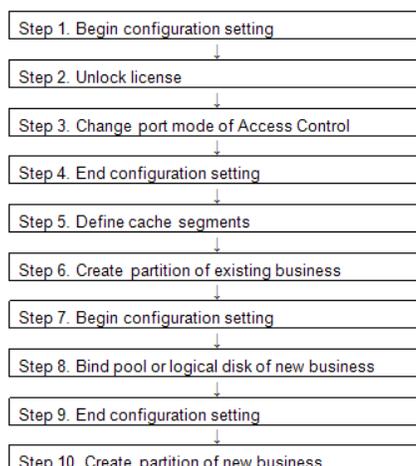
```
Step 1. Begin configuration setting
            ↓
Step 2. Unlock license
            ↓
Step 3. Change port mode of Access Control
            ↓
Step 4. End configuration setting
            ↓
Step 5. Define cache segments
            ↓
Step 6. Create partition of existing business
            ↓
Step 7. Begin configuration setting
            ↓
Step 8. Bind pool or logical disk of new business
            ↓
Step 9. End configuration setting
            ↓
Step 10. Create partition of new business
```

Figure 4-6: Post Installation Flow

9. Begin configuration setting

Select the disk array for which to install the partitioning function in the SnapSAN Manager client (Web GUI) main screen and start [Configuration Setting] to begin setting the configuration.

10. Unlock license

Unlock the VirtualStoragePartitioning license using the Setting Disk Array operation of configuration setting.

11. Change port mode of Access Control

To allocate a port to a partition, the access mode of that port must be Port mode.

Perform Change the Mode of Port for the port used by the new business by using the Setting Access Control operation of configuration setting to change the access mode of the port to be allocated to Port mode.

Since a port that is set to WWN mode is a shared resource of the entire disk array, it cannot be allocated to a partition.

If the access mode of the port being used by the existing business is WWN mode, a partition is created without allocating that port to the partition.

To change the access mode of the port being used by the existing business from WWN mode to Port mode, tasks that reset Access Control (such as recreating the LD Set) are necessary. Moreover, those tasks are accompanied by stopping work.

12. End configuration setting

Terminate configuration setting.

13. Define cache segments

If you wish to use the cache memory used by the existing business and new business partitions exclusively without influence or interference from other businesses, define an exclusive cache segment and allocate it to the partition. Perform cache segment definition by starting the Cache Segment Setting function.

The allocated capacity of a cache segment can be adjusted later while checking the ratio of total capacity of logical disks assigned to the cache segment.

If it is not necessary for the cache memory to be used exclusively by the partition, use a shared cache segment (default segment) within the node. If you allocate a default segment to a partition, you need not define a cache segment.

While Cache Segment Setting is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate Cache Segment Setting.

The necessity of increasing cache memory or the setting of cache segment allocated capacity must be thoroughly examined in advance.

If the capacity of cache memory used by an existing business is less than before due to the addition of a new business or the definition of a cache segment, there is a risk of the existing business being affected in ways such as lowered performance of the existing business.

14. Create partition of existing business

Create a partition for the existing business by starting the partitioning wizard.

At that time, allocate partition users and pool or logical disk, port (if the access mode of the port is Port mode), and cache segment resources of the existing business to the partition as needed. The partition users must have been created before creating the partition.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

If the access mode of the port being used by the existing business is WWN mode, a partition is created without allocating that port to the partition.

When allocating the pool of the existing business to a partition, the LD Set to which the logical disks bound in that pool are assigned is also allocated together with the pool. In that case, each and every one of the ports linked to the LD Set must be allocated to the same partition.

When allocating the logical disk of the existing business to a partition, the LD Set to which the logical disk is assigned is also allocated together with the pool. In that case, each and every one of the ports linked to the LD Set must be allocated to the same partition.

15. Begin configuration setting

Begin configuration setting again for the disk array for which the partitioning function was installed.

16. Bind pool or logical disk of new business

Start the pool binding wizard using the LD Individual Bind/Unbind operation of configuration setting and bind the pool to be allocated to the partition of the new business (exclusive pool) or the pool jointly used within a partition (shared pool) of which logical disks are allocated to the partition.

By using the LD Individual Bind/Unbind operation of configuration setting, also bind the logical disks from the shared pool as needed.

The binding of logical disks to a bound pool (exclusive pool) is carried out by a storage group user whose role is administrator or partition user after the pool is allocated.

The binding of logical disks to a shared pool is carried out only by a storage group user whose role is administrator.

17. End configuration setting

Terminate configuration setting.

18. Create partition of new business

Create a partition for the new business by starting the partitioning wizard.

At that time, allocate partition users and pool, logical disk, cache segment, and port resources to the partition as needed. The partition users must have been created before creating the partition.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

Hereafter, configuration setting operations on resources in partitions can be performed by the storage group users whose role is administrator or the partition users whose role is administrators who were given operation authority for the partitions of the existing business and new business, respectively.

LD Binding and Setting Access Control should be performed for the partition of the new business by a storage group user whose role is administrator or a partition user whose role is administrator who has operation authority.

- LD Binding

    Bind logical disks to a pool allocated to a partition.

- Setting Access Control

    - Specify the subject partition and create an LD Set.

    - Set a link between the LD Set created and path information.

    - Assign logical disks to the LD Set created.

Post-installation (Applying Partitions to New Businesses)

The figure below shows an operation example for installing the partitioning function after the fact for a disk array with which a business is already working and applying a partition to a newly added business only. Installation of the partitioning function can be done with the existing business continuing to operate without stopping its work.

In this operation example, the pool used by the newly added business is taken to be bound.
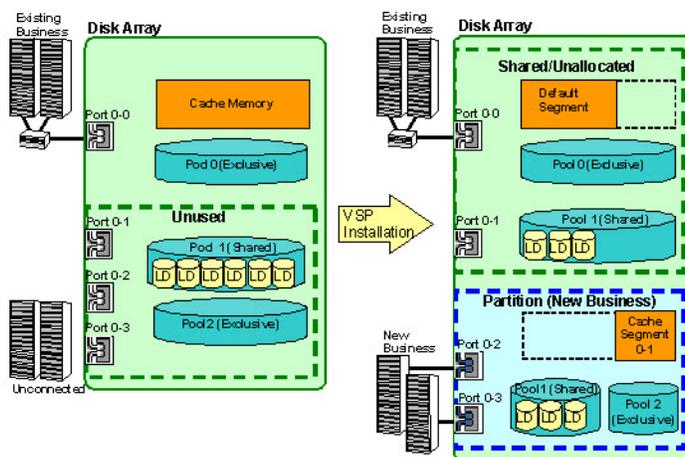

Figure 4-7: Post Installation - Newly Added

The operations below should be carried out by a storage group user whose role is administrator.
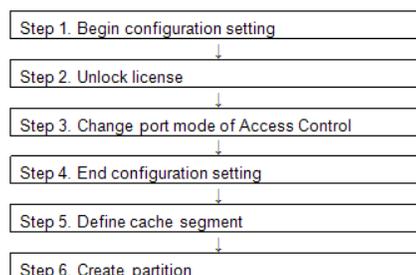
```
Step 1. Begin configuration setting
            ↓
Step 2. Unlock license
            ↓
Step 3. Change port mode of Access Control
            ↓
Step 4. End configuration setting
            ↓
Step 5. Define cache segment
            ↓
Step 6. Create partition
```

Figure 4-8: Post Installation Flow

1. Begin configuration setting

    Select the disk array for which to install the partitioning function in the SnapSAN Manager client (Web GUI) main screen and start [Configuration Setting] to begin setting the configuration.

2. Unlock license

    Unlock the VirtualStoragePartitioning license using the Setting Disk Array operation of configuration setting.

3. Change port mode of Access Control

    To allocate a port to a partition, the access mode of that port must be Port mode.

    Perform Change the Mode of Port for the port used by the new business by using the Setting Access Control operation of configuration setting to change the access mode of the port to be allocated to Port mode.

    Since a port that is set to WWN mode is a shared resource of the entire disk array, it cannot be allocated to a partition.

    When a port is set to WWN mode, the port is used without allocating it to a partition.

4. End configuration setting

    Terminate configuration setting.

5. Define cache segment

If you wish to use the cache memory used by the new business partition exclusively without influence or interference from the existing business, define an exclusive cache segment and allocate it to the partition. Perform cache segment definition by starting the Cache Segment Setting function.

The allocated capacity of a cache segment can be adjusted later while checking the ratio of total capacity of logical disks assigned to the cache segment.

If it is not necessary for the cache memory used by the new business partition to be used exclusively by that partition, use a shared cache segment (default segment) within the node. If you allocate a default segment to a partition, you need not define a cache segment. In that case, the cache memory of the default segment will be used in common with the existing business.

While Cache Segment Setting is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate Cache Segment Setting.

The necessity of increasing cache memory or the setting of cache segment allocated capacity must be thoroughly examined in advance.

If the capacity of cache memory used by an existing business is less than before due to the addition of a new business or the definition of a cache segment, there is a risk of the existing business being affected in ways such as lowered performance of the existing business.

6. Create partition

Create a partition by starting the partitioning wizard.

At that time, allocate partition users and pool, logical disk, cache segment, and port resources to the partition as needed. The partition users must have been created before creating the partition.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

Hereafter, configuration setting operations on resources in the partition can be performed by the storage group user whose role is administrator or the partition user whose role is administrator who was given operation authority for the partition of the new business. Perform LD Binding and Setting Access Control for the partition of the new business.

• LD Binding

Bind logical disks to a pool allocated to a partition.

• Setting Access Control

Specify the subject partition and create an LD Set.

Set a link between the LD Set created and path information.

Assign logical disks to the LD Set created.

Resource maintenance and configuration setting for the existing business is performed as usual by a storage group user.

7. Business expansion

The figure below shows an operation example of extending disks, cache memory, and ports and additionally allocating them to existing partitions in an operation in which the partitioning function has been installed and partitions have already been applied to multiple businesses. The addition of resources shown below can be done without stopping businesses.

In this operation example, it is assumed that disks, cache memories, and ports have been expanded by adding nodes by the maintenance engineer.
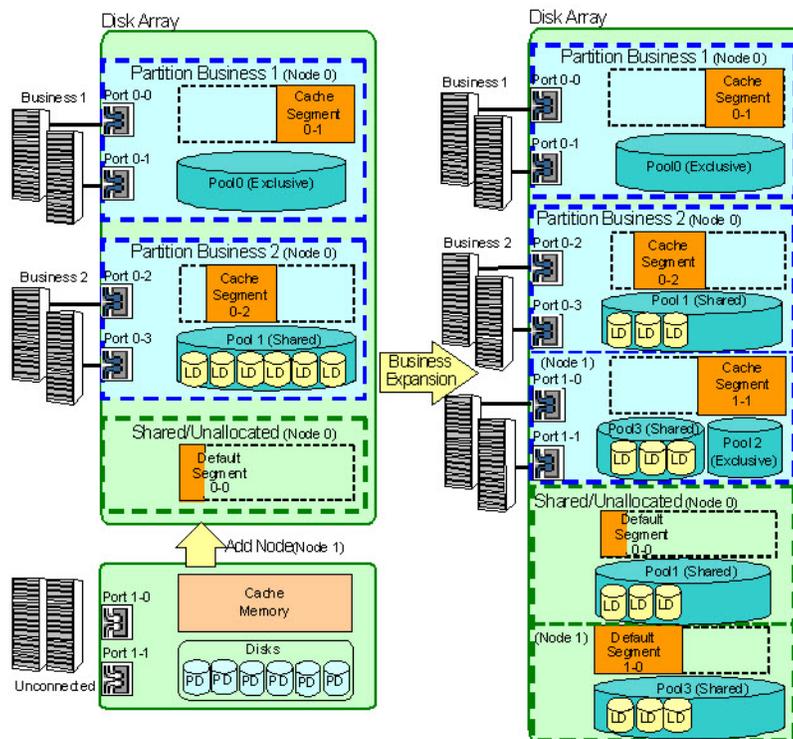
Figure 4-9: Business Expansion

The operations below should be carried out by a storage group user whose role is administrator.
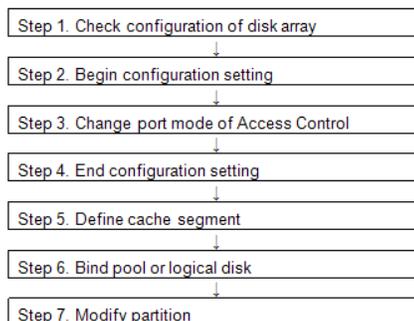
Figure 4-10: Check Configuration Flow

1. Check configuration of disk array

   Check the node configuration of the disk array in the SnapSAN Manager client (Web GUI) main screen and confirm that disks, cache memory, and ports have been extended.

   If there are insufficient licenses for products being used due to node addition or resource extension, licenses must be added and unlocked by configuration setting operations.

2. Begin configuration setting

   Select the disk array on which to operate in the SnapSAN Manager client (Web GUI) main screen and start [Configuration Setting] to begin setting the configuration.

3. Change port mode of Access Control

   To allocate an extended port to an existing partition, the access mode of that port must be Port mode.

   Perform Change the Mode of Port for a port to be allocated by using the Setting Access Control operation of configuration setting to change the access mode to Port mode.

   Since a port that is set to WWN mode is a shared resource of the entire disk array, it cannot be allocated to a partition.

   When a port is set to WWN mode, the port is used without allocating it to a partition.

4. End configuration setting

   Terminate configuration setting.

5. Define cache segment

   To use extended cache memories exclusively in an existing partition to which the resources are to be added, define an exclusive cache segment and allocate it to the partition. Start the cache partitioning function to define a cache segment. The allocated capacity of a cache segment can be adjusted later while checking the ratio of total capacity of logical disks assigned to the cache segment by node.

   When it is unnecessary for the partition to exclusively use extended cache memories, it uses the shared cache segments (default segments) within the partition. To allocate a default segment to a partition, defining a cache segment is not needed.

   Cache segments are defined by node and allocated to a partition. The cache segment can be used only by logical disks bound in a pool of the same node.

While Cache Segment Setting is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate Cache Segment Setting.

Cache segments and the logical disks that are assigned to them are independent for each node. Cache segment in the partition cannot be used by logical disks of different nodes or otherwise shared between nodes.

6. Bind pool or logical disk

Start the pool binding wizard using the LD Individual Bind/Unbind operation of configuration setting and bind the pool to be newly allocated to the existing partition (exclusive pool) or the pool jointly used within a partition (shared pool) of which logical disks are allocated to the partition.

A pool is bound by node and allocated to a partition. A pool across two or more nodes cannot be bound.

By using the LD Individual Bind/Unbind operation of configuration setting, also bind the logical disks from the shared pool as needed.

The binding of logical disks to a bound pool is carried out by a storage group user whose role is administrator or partition user after the pool is allocated.

7. Modify partition

Start the partitioning wizard and allocate the newly bound pool, cache segment, and port to an existing partition as needed.

While the partitioning wizard is active, monitoring of the disk array subject to the operations is stopped because it is undergoing configuration setting.

Resume monitoring of the disk array after you terminate the partitioning wizard.

Binding logical disks to a newly allocated pool, LD Set addition, and other Access Control settings should be made by the storage group user whose role is administrator or the partition user whose role is administrator who has operation authority for the existing partition.

- LD Binding

    Bind logical disks to a pool allocated to a partition.

- Setting Access Control

    - Specify the subject partition and create an LD Set.
    - Set a link between the LD Set created and path information.
    - Assign logical disks to the LD Set created.

Basic Methods

Overview

This chapter explains the basic methods for performing partitioning operations from SnapSAN Manager. SnapSAN Manager provides partition setting, cache partitioning, and information display functions. Operations from SnapSAN Manager are offered by an SnapSAN Manager client (Web GUI) that makes it easy to perform operations using intuitive images from a GUI.
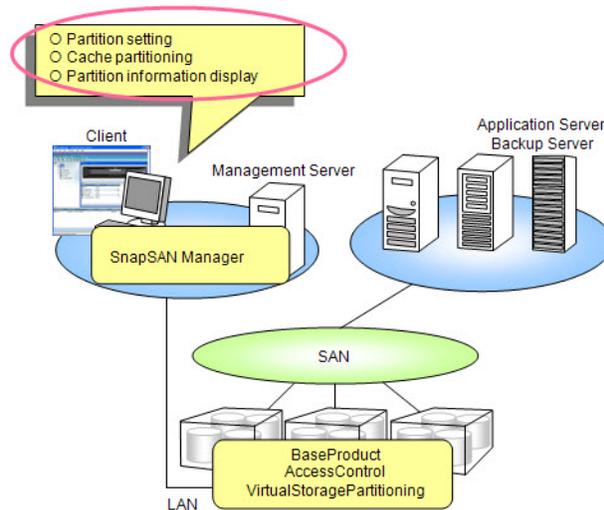

Figure 5-1: Partitioning Operations - SnapSAN Manager

A list of the functions offered by SnapSAN Manager is shown below.

Operation	Storage Group User			Partition User		
	Monitor	Operator	Administrator	Monitor	Operator	Administrator
Setting Users	-	-	✓	-	-	-
Creating Partitions	-	-	✓	-	-	-
Modifying Partitions	-	-	✓	-	-	-
Deleting Partitions	-	-	✓	-	-	-
Defining Cache Segments	-	-	✓	-	-	-

Operation	Storage Group User			Partition User		
	Monitor	Operator	Administrator	Monitor	Operator	Administrator
Modifying Cache Segments	-	-	✓	-	-	-
Deleting Cache Segments	-	-	✓	-	-	-

✓: Capable of operation -: Incapable of operation

Storage group user: User who manages the disk array as a whole

Partition user: User who manages specific partitions

Monitor: Disk array monitoring, status display, and other referencing are permitted

Operator: Operations needed for handling the partitioning function are permitted

Administrator: All operations are permitted, including setting the disk array configuration

The partition information can be referred to by a user whose user role is monitor or higher. For a partition user, only the partition information for which operation authority was given is referable.

SnapSAN Manager Main Window

The SnapSAN Manager main window is the first window that appears when you connect the SnapSAN Manager client to the SnapSAN Manager server. It displays information about the configuration of the disk arrays monitored by SnapSAN Manager and the states of resources. In addition, the partitioning wizard and Cache Segment Setting screen start from the SnapSAN Manager main window toolbar and menus.

The SnapSAN Manager main window displays information related to partitioning.

If the disk array for which VirtualStoragePartitioning has been purchased is monitored, the configuration display area is handled as a tab and the partition information is displayed as the "Partition" tab additionally. General information related to the disk array is displayed as the "Diskarray" tab. If, however, you log into the system as the partition user, only the partition tab is displayed.
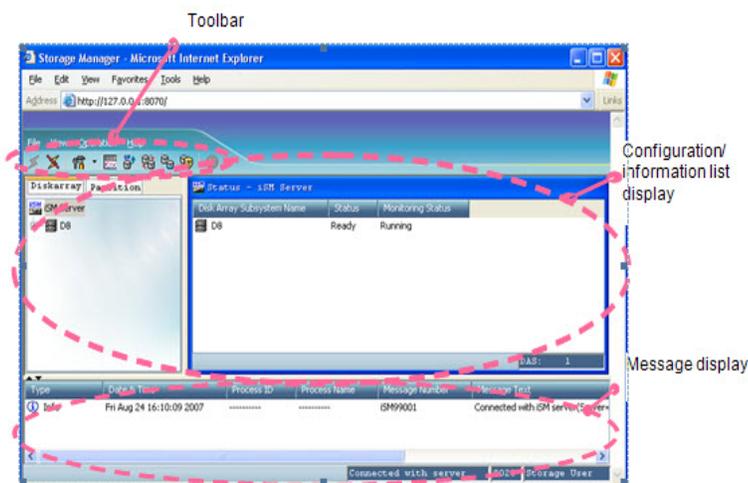
Toolbar

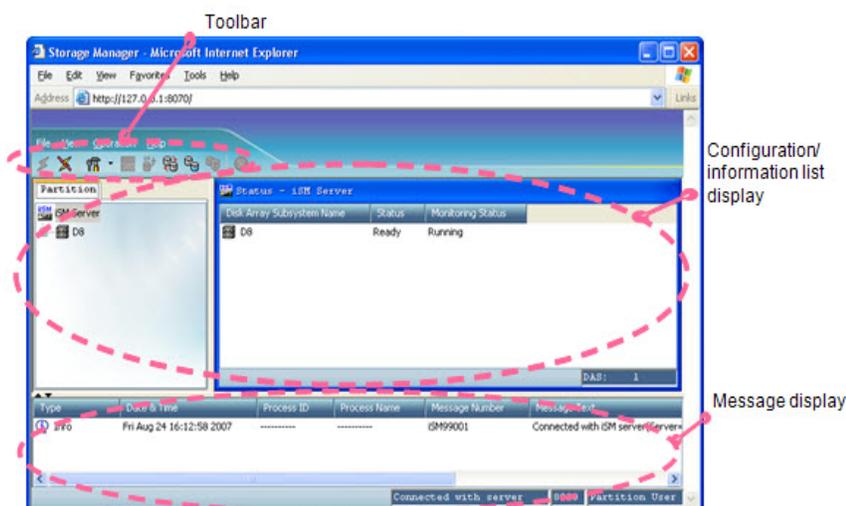**Figure 5-2: SnapSAN Manager Client - Group Users**

Toolbar

Figure 5-3: SnapSAN Manager Client - Partition Users

For a partition user, only disk arrays belonging to a partition for which authority was given are displayed.

Starting the User Setting Screen

The User Setting screen is used to create partition users.

The screen is started by selecting [Setting/Binding] - [User Setting] from the menu of an SnapSAN Manager client (Web GUI) main screen.

1. Only a storage group user whose role is administrator can use this screen.

2. The User Setting screen cannot be activated simultaneously by multiple clients connected to the same SnapSAN Manager server.

3. VSPAR Setting, Cache Segment Setting, and user setting cannot be activated simultaneously by multiple clients connected to the same SnapSAN Manager server.

Starting the Partitioning Wizard

The partitioning wizard is used to create partitions.

The wizard is started by displaying the "Partition Information List" screen using the procedures below.

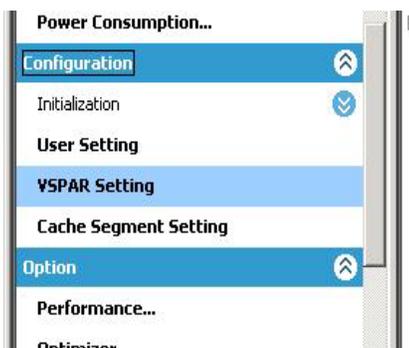- After selecting a disk array in the SnapSAN Manager main window, select [Binding] - [VSPAR Setting] from the toolbar.

Figure 5-4: VSPAR Setting Menus

Partitions can be created, modified, or deleted using the screen that is displayed
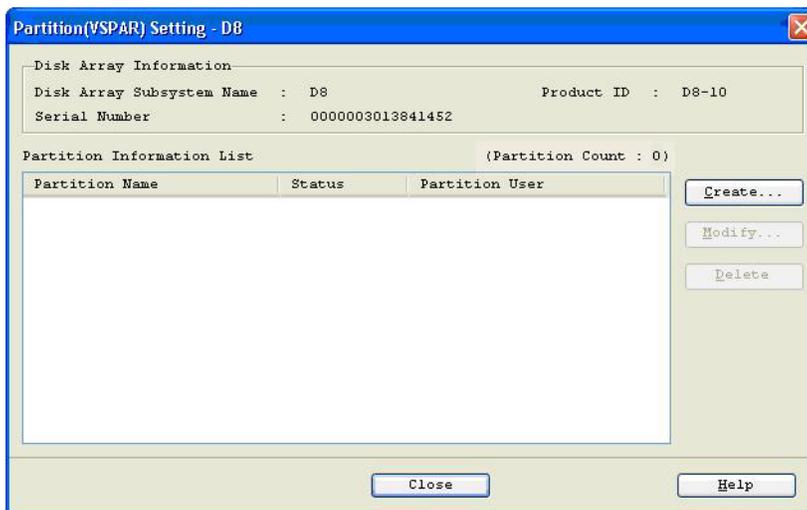
Figure 5-5: Partition Information List

Disk Array Information: The disk array subsystem name, product ID, and serial number of the disk array selected in the SnapSAN Manager main window are displayed.

Partition Information List: A list of the partitions that belong to the disk array selected in the SnapSAN Manager main window is displayed.

Status	Explanation of Status
Normal	All resources allocated to the partition are normal.
Normal(Maintenance)	An event requiring maintenance occurred at a resource allocated to the partition.
Attn.(Invalid Configuration of Partition)	Allocation to the partition failed and the partition configuration is invalid.
Fault	A fault occurred at a resource allocated to the partition.
Unknown	The relation of a resource allocated to the partition is unknown.

[Create] button: Creates a partition.

Clicking the button starts the wizard.

[Modify] button: Edits the partition selected in Partition Information List.

Clicking the button starts the wizard.

[Delete] button: Deletes the partition selected in Partition Information List.

[Close] button: Closes the screen.

Starting the Cache Segment Setting Screen

The Cache Segment Setting screen is used to create cache segments.

Any of the procedures below starts the Cache Segment Setting screen.

- After selecting a disk array in the SnapSAN Manager main window, select [Binding] - [Cache Segment Setting] from the toolbar.
- Select the [Cache Segment Setting] button of the Cache Segment Allocation screen in the partitioning wizard.
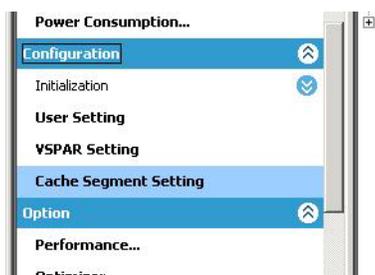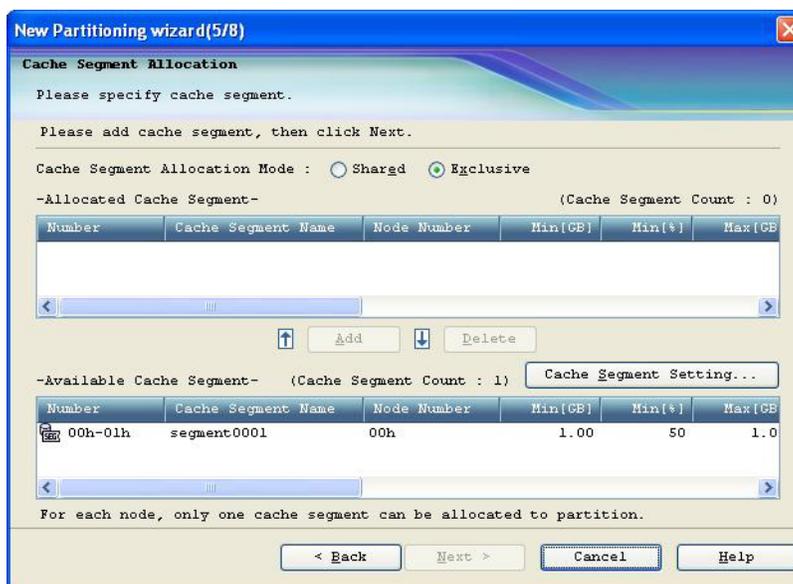

Figure 5-6: Cache Segment Setting

Figure 5-7: New Partitioning Wizard

Cache segments can be defined, modified, or deleted using the screen that is displayed.

Figure 5-8: Cache Segment Setting

Node Number: Displays Cache Segment List narrowed down by node number.

Cache Segment List: The cache segments belonging to the selected disk array are displayed.

Available Cache Capacity: The total capacity of cache memory that is subject to cache partitioning is displayed.

Maximum Segment Count: The number of segments that can be defined (Total number of segments that can be defined - Number of cache segments defined) is displayed.

[New] button: Defines a cache segment.

[Edit] button: Edits the cache segment selected in Cache Segment List.

[Delete] button: Deletes the cache segment selected in Cache Segment List.

[OK] button: Settings are made to the disk array.

[Cancel] button: Closes the screen.

Setting Users

User Setting Screen

Partition users are created, modified, and deleted from the User Setting screen.

Setting Partitions

Creating and Modifying Partitions

Partitions are created and modified in wizard mode. Creation and modification of partitions can be done by making settings according to the instructions of the wizard.

1. Starting the Partition Creation (Modification) Wizard

   Click the [Create] button from the "Partition Information List" screen or select a partition from Partition Information List and click the [Modify] button.
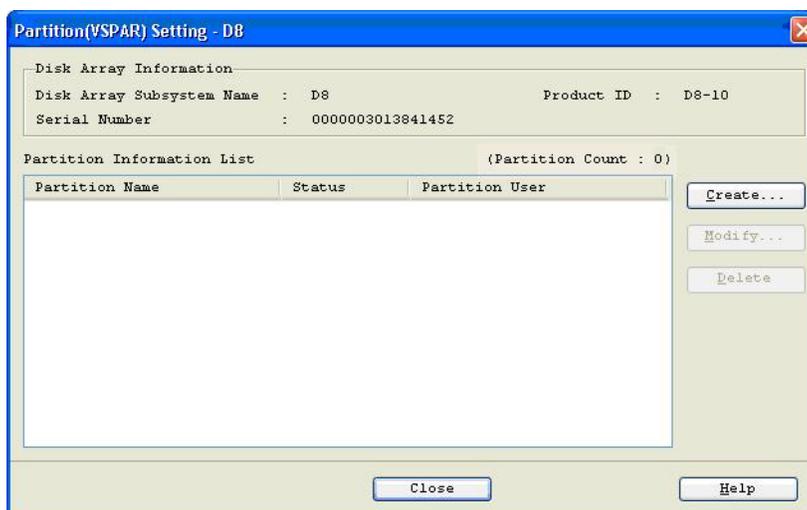
Figure 5-9: Starting Partition Creation (Modification Wizard

Actions on "Partition Information List" screen errors

If errors occur in the "Partition Information List" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05200] Failed to get information.	Communication with the SnapSAN Manager server failed for a reason such as communication timeout. Check the status of the server and reconnect.
[05904] The number of partition is already maximum.	Make the total number of partitions to be bound no greater than 127.
[05905] Failed to update information.	Version upgrade failed for a reason such as temporarily invalid disk array status. Check the status of the disk array and execute again.

2. Beginning the Partition Creation (Modification) wizard

Clicking the [Create] button from the "Partition Information List" screen displays the "Welcome to new Partitioning wizard" screen.
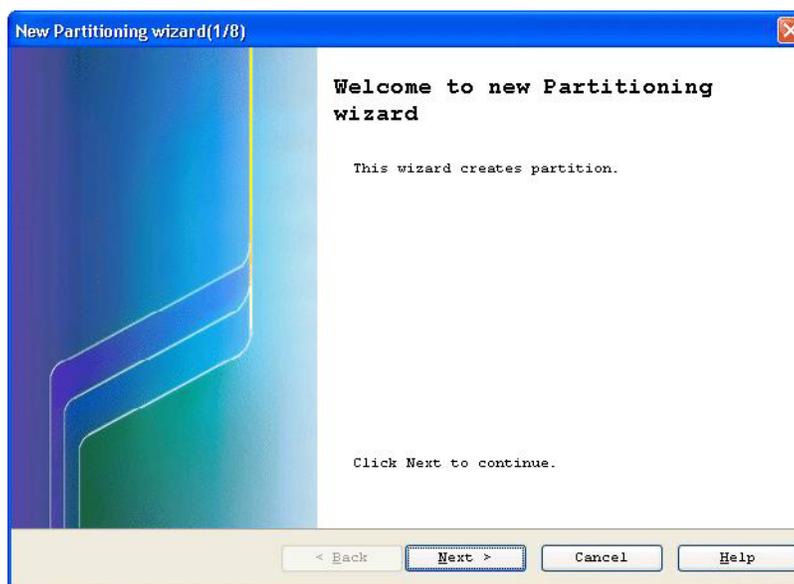
Figure 5-10: Beginning Partition Creation Wizard

[Next] button: The next screen is displayed.

[Cancel] button: Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

Figure 5-11: Terminate Wizard

Selecting a partition from Partition Information List and clicking the [Modify] button displays the "Welcome to edit Partitioning wizard" screen.
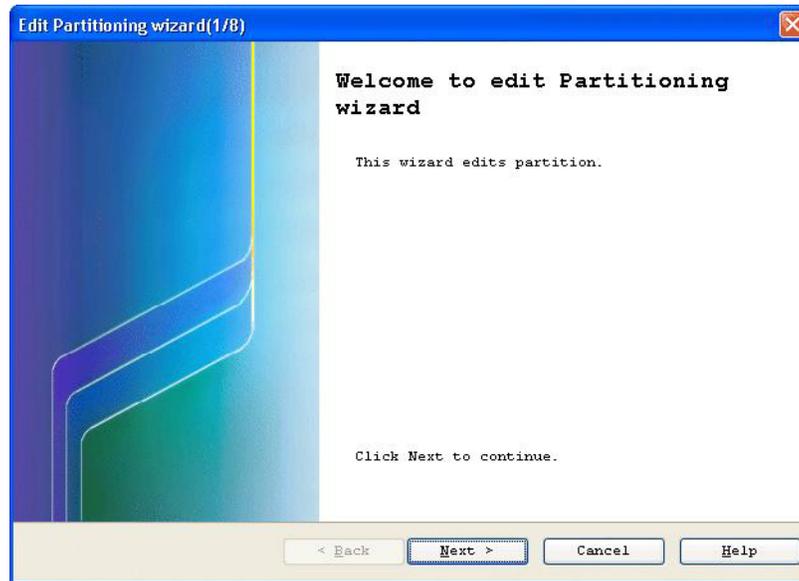
Figure 5-12: Edit

[Next] button: The next screen is displayed.

[Cancel] button: Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

3. Base setting of partitions

Clicking the [Next] button in the "Welcome to new Partitioning wizard" screen or "Welcome to edit Partitioning wizard" screen displays the "Base Setting" screen. For partition modification, information that is already set is displayed.
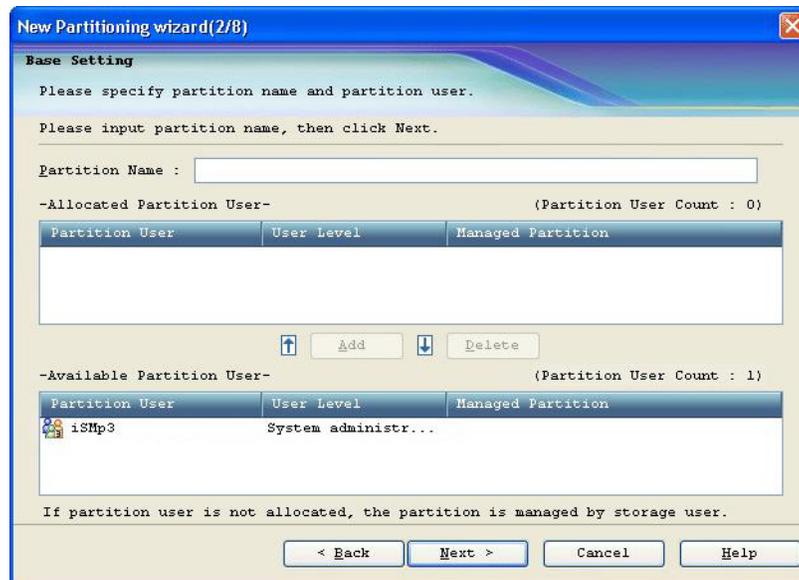

Figure 5-13: Base Setting Partition

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Base Setting specifies a partition name and a user who manages the partition. When a partition user is not allocated to partitions, a storage group user manages partitions.

Partition Name:

- Input the name of a partition.
- A partition name can be specified using up to 32 single-byte alphanumeric, underbar ("_"), and slash ("/") characters.

Allocated Partition User:

- A list of the users allocated to the partition is displayed.

[Add] button:

- Selecting a user from Available Partition User and clicking this button adds the selected user to Allocated Partition User.

[Delete] button:

- To delete a user allocated to the partition, select the user from Allocated Partition User and click this button. The selected user is added to Available Partition User.

Available Partition User:

- A list of users who can be allocated to the partition is displayed.

[Next] button:

- The next screen is displayed.

[Back] button:

- Returns to the previous screen.

[Cancel] button:

- Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

Actions on "Base Setting" screen errors

- If errors occur in the "Base Setting" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05918] Setting partition name is incorrect. Cannot use characters other than alphanumeric characters, "/", "_".	There is a mistake in partition name input. Input a partition name made up of single-byte alphanumeric, "/", and "_" characters.
[05919] Partition name either exists or being reserved. Please specify another name.	A partition of the same name already exists or a reserved word was specified for a partition name. Input a different partition name. Reserved words: DefaultPartition, Unallocated (not case-sensitive)
[05931] Please input new partition name.	It is mandatory to input a partition name. Specify a partition name.

Allocating disk capacity to partitions (pool allocation method)

Clicking the [Next] button in the "Base Setting" screen displays the "Disk Capacity Allocation (Pool Allocation)" screen. For partition modification, information that is already set is displayed.
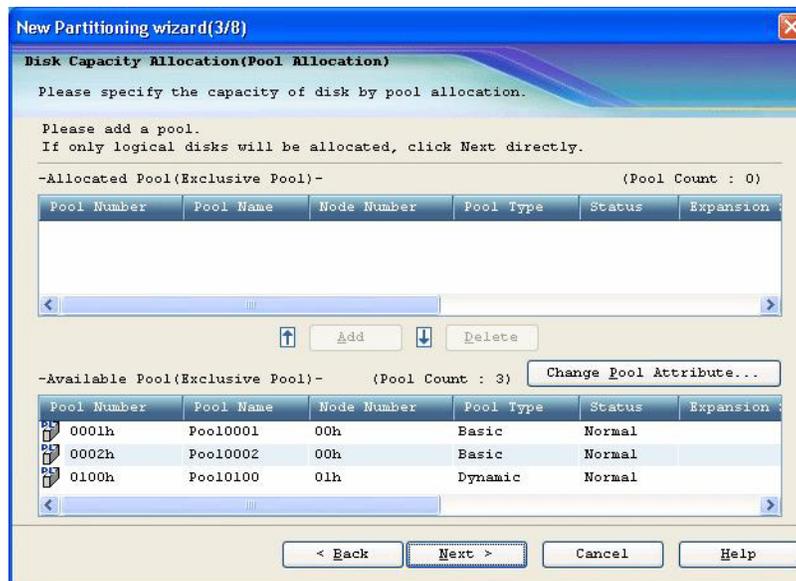

Figure 5-14: Disk Capacity Allocation

The disk capacity allocation is performed by allocating exclusive pools.

For assigning only logical disks, this setting is not required.

Allocated Pool (Exclusive Pool):

A list of exclusive pools that are allocated to the partition is displayed.

[Add] button:

Selecting a pool from Available Pool and clicking this button adds the selected pool to Allocated Pool.

[Delete] button:

To delete a pool that is allocated to the partition, select the pool from Allocated Pool and click this button. The selected pool is added to Available Pool.

Available Pool (Exclusive Pool):

A list of exclusive pools that can be allocated to the partition is displayed.

[Change Pool Attribute] button:

Displays the "Change Pool Attribute" screen.

[Next] button:

The next screen is displayed.

[Back] button:

Returns to the previous screen.

[Cancel] button:

Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

Actions on "Disk Capacity Allocation (Pool Allocation)" screen errors

If errors occur in the "Disk Capacity Allocation (Pool Allocation)" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05923] Locked logical disks are allocated to selected pool. Pool cannot be allocated or deleted.	Check the pool status. It is impossible to allocate/delete it while configuration change of logical disks has been locked. It is possible to allocate/delete it by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.
[05933] Some LD Sets are using pools which are not allocated to this partition. Please add the following pools. Pool Number:	There is an LD Set that is using a pool not allocated to the partition. It is necessary to allocate the pool of which pool number is displayed in the message to the partition. Check the pool and execute again.
[05937] The pool that contains re-configuration LD cannot be operated.	Replacement by the performance optimization function is in progress for a logical disk in the pool. It is possible to allocate/delete the pool after completion of replacement.
[05947] Some LD Sets are using pools that are not allocated to this partition. Please add the following exclusive pools. Pool number: Attention: There are multiple exclusive pools that must be allocated. If logical disks of multiple exclusive pools are assigned to the same LD Set, those pools must be allocated to a partition simultaneously. Please confirm related LD Sets and logical disks from allocated exclusive pool list, and add related unallocated exclusive pools.	There is an LD Set that is using a pool not allocated to the partition. It is necessary to allocate the pool of which pool number is displayed in the message to the partition. Check the pool and execute again.

If logical disks of multiple pools are allocated to the same LD Set, those pools must be allocated to a partition simultaneously.

4. Allocating disk capacity to partitions (logical disk allocation method)

   Clicking the [Next] button in the "Disk Capacity Allocation (Pool Allocation)" screen displays the "Disk Capacity Allocation (Logical Disk Allocation)" screen. For partition modification, information that is already set is displayed.
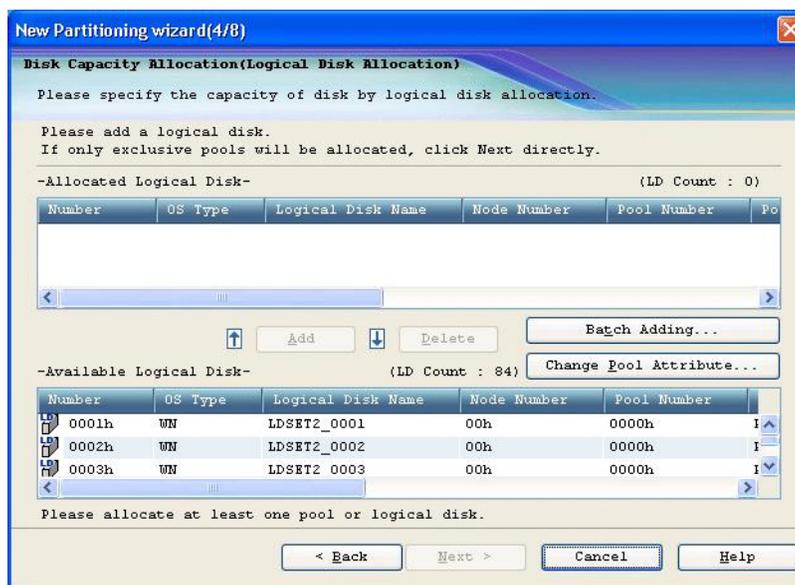
Figure 5-15: Logical Disk Allocation

The disk capacity allocation is performed by allocating logical disks.

For assigning only exclusive pools, this setting is not required.

Allocated Logical Disk:

A list of logical disks that are allocated to the partition is displayed.

[Add] button:

Selecting a logical disk from Available Logical Disk and clicking this button adds the selected logical disk to Allocated Logical Disk.

[Delete] button:

To delete a logical disk that is allocated to the partition, select the logical disk from Allocated Logical Disk and click this button. The selected logical disk is added to Available Logical Disk.
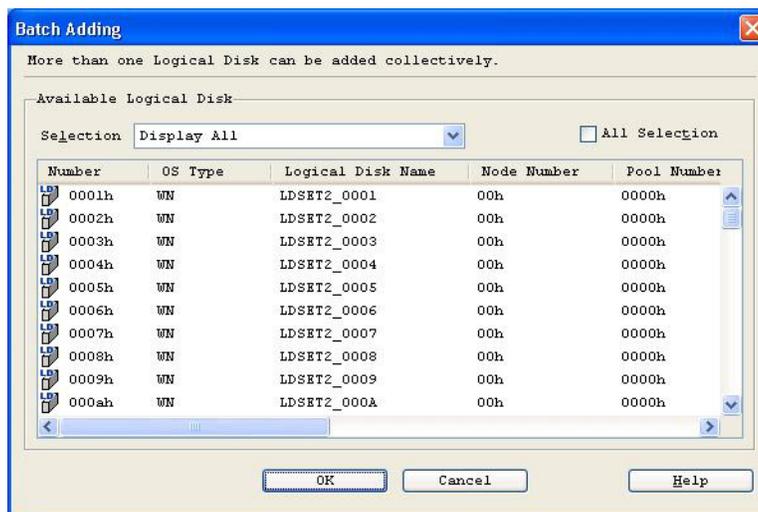
Available Logical Disk:

A list of logical disks created in the shared pools that can be allocated to the partition is displayed.

[Batch Adding] button:

Adds the logical disks in a batch. Use this button to allocate a lot of logical disks in a case such as allocating the logical disks having been assigned to an LD Set in a batch. When there are no logical disks that can be allocated, this operation cannot be performed.

[Change Pool Attribute] button:

Displays the "Change Pool Attribute" screen.

[Next] button:

The next screen is displayed. When no pools or logical disks have been allocated, this operation cannot be performed.

[Back] button:

Returns to the previous screen.

[Cancel] button:

Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

<Procedure of batch adding of available logical disks>

This screen is used for selecting a lot of logical disks and allocating the logical disks to the partition in a batch. It is possible to narrow the display by using an LD Set as a key.

   1. Click the [Batch Adding] button.

   2. The "Batch Adding" screen is displayed.

Figure 5-16: Batch Adding - Logical Disks

Available Logical Disk:

A list of logical disks created in the shared pools that can be allocated to the partition. It is possible to narrow the display by a keyword in the pull-down menu.

Selection:

The display of available logical disks can be narrowed by an LD Set name.

[All Selection] check box:

The logical disk selection operation in [Available Logical Disk] can be assisted.

This check box enables the following auxiliary selection operation.

    "When checked:
    All the logical disks displayed in [Available Logical Disk] are selected.
    "When unchecked:
    The logical disks selected in [Available Logical Disk] are unselected.

[Cancel] button:

Returns to the "Disk Capacity Allocation (Logical Disk Allocation)" screen.

   3. Select the logical disks that you want to add.

   4. Click the [OK] button.

Clicking the [OK] button returns to the "Disk Capacity Allocation (Logical Disk Allocation)" screen and the selected logical disks are displayed in [Allocated Logical Disk].

*   Actions on "Disk Capacity Allocation (Logical Disk Allocation)" screen errors

    If errors occur in the "Disk Capacity Allocation (Logical Disk Allocation)" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05938] **The re-configuration LD cannot be operated.**	Replacement by the performance optimization function is in progress for a logical disk. It is possible to allocate/delete the logical disk after completion of replacement.
[05940] **Locked logical disks are selected.** **Logical disks cannot be allocated or deleted.**	Check the logical disk status. It is impossible to allocate/delete it while configuration change of logical disks has been locked. It is possible to allocate/delete it by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.
[05941] **Some LD Sets are using logical disks that are not allocated to this partition.** **Please add the following LD Sets' logical disks.** **LD Set Name:**	There is an LD Set that is using a logical disk not allocated to the partition. It is necessary to allocate also the logical disks in the same LD Set to the partition. Check the LD Set name and reexecute the allocation of the logical disks again.
[05942] **Some LD Sets are using logical disks that are not allocated to this partition.** **Please add the following LD Sets' logical disks.** **LD Set Name:** **Attention:** **There are multiple LD Sets, which contain logical disks that must be allocated.** **All logical disks that are assigned to the same LD Set must be allocated to a partition simultaneously.** **Please confirm LD Sets from the allocated logical disk list, and add related unallocated logical disks.**	There are a lot of LD Sets that are using a logical disk not allocated to the partition. It is necessary to allocate also the logical disks in the same LD Set to the partition. Check the LD Set names and reexecute the allocation of the logical disks again.
[05943] **Some LD Sets are using pools that are not allocated to this partition.** **Please click [Back], and add the following exclusive pools in the Pool Allocation window.** **Pool Number:**	There is an LD Set that is using a pool not allocated to the partition. It is necessary to allocate the pool of which pool number is displayed in the message to the partition. Check the pool and execute again.

Error Message	Description and Action
[05944] **Some LD Sets are using pools that are not allocated to this partition.** **Please click [Back], and add the following exclusive pools in the Pool Allocation window.** **Pool Number:** **Attention: There are multiple exclusive pools that must be allocated. Because logical disks of multiple exclusive pools are assigned to the same LD Sets that contain the allocated logical disks, the exclusive pools' allocation is insufficient.** **Please confirm related LD Sets from the allocated logical disk list. If logical disks of unallocated exclusive pools are assigned to the related LD Sets, add those pools to this partition simultaneously.**	There is an LD Set that is using a pool not allocated to the partition. It is necessary to allocate the pool of which pool number is displayed in the message to the partition. Check the pool and execute again.
[05945] **Some LD Sets are using logical disks that are not allocated to this partition.** **Please add the following LD Sets' logical disks.** **LD Set Name:** **Moreover, some LD Sets are using pools that are not allocated to this partition.** **Please click [Back], and add the following exclusive pools in the Pool Allocation window.** **Pool Number:**	There is an LD Set that is using a logical disk and a pool not allocated to the partition. Check the LD Set name and pool and execute again.

Error Message	Description and Action
[05946] Some LD Sets are using logical disks that are not allocated to this partition. Please add the following LD Sets' logical disks. LD Set Name: Moreover, some LD Sets are using pools that are not allocated to this partition. Please click [Back], and add the following exclusive pools in the Pool Allocation window. Pool Number: Attention: There are multiple LD Sets and exclusive pools, which contain logical disks that must be allocated. Please confirm LD Sets from the allocated logical disk list, and add related unallocated logical disks and exclusive pools.	There are a lot of LD Sets that are using a logical disk and a pool not allocated to the partition. Check the LD Set names and pool and execute again.

All the logical disks assigned to an LD set must be allocated to the same partition. Moreover, when there is a logical disk bound to an exclusive pool in the LD set to which the allocated logical disks belong, the exclusive pool must also be allocated to the partition. To newly allocate an exclusive pool, click the [Back] button on the wizard screen and perform the additional allocation in the "Disk Capacity Allocation (Pool Allocation)" screen.

5. Allocating cache to partitions

Clicking the [Next] button in the "Disk Capacity Allocation (Logical Disk Allocation)" screen displays the "Cache Segment Allocation" screen. For partition modification, information that is already set is displayed.

Cache Segment Allocation allocates cache segments to a partition.

Cache Segment Allocation Mode:

Selects the cache capacity allocation method.

Shared: Allocate a default segment.

Exclusive: Allocate a defined cache segment.

Allocated Cache Segment:

A list of cache segments allocated to the partition is displayed.

[Add] button:

Selecting a cache segment from Available Cache Segment and clicking this button adds the selected cache segment to Allocated Cache Segment. This is not available when Cache Segment Allocation Mode is Shared.

[Delete] button:

To delete a cache segment that is allocated to the partition, select the cache segment from Allocated Cache Segment and click this button. The selected cache segment is added to Available Cache Segment. This is not available when Cache Segment Allocation Mode is Shared.

Available Cache Segment:

A list of cache segments that can be allocated to the partition is displayed.

[Cache Segment Setting] button:

The "Cache Segment Setting" screen is displayed.

[Next] button:

The next screen is displayed.

[Back] button:

Returns to the previous screen.

[Cancel] button:

Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

- Actions on "Cache Segment Allocation" screen errors

  If errors occur in the "Cache Segment Allocation" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05914] Only one cache segment can be allocated to each node. Please select again.	Select again so that one cache segment is allocated per node.
[05915] Node number of the selected cache segment is different from the pool or logical disk. Please select again.	Select again so that the node number of the selected pool or logical disk is the same as the node number of the selected cache segment.
[05922] Locked logical disks are allocated to selected cache segment. Cache segment cannot be allocated or deleted.	Check the status of the logical disk. It is impossible to allocate/delete it while configuration change of logical disks has been locked. It is possible to allocate/delete it by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.

Only one cache segment can be allocated per node.

Changing from Exclusive to Shared releases cache segments that were allocated exclusively.

When deleting a cache segment from a partition to which multiple nodes are allocated, the cache segment of all nodes must be deleted.

When deleting all exclusive cache segments from a partition, change the Cache Segment Allocation Mode to Shared.

Allocating ports to partitions

Clicking the [Next] button in the "Cache Segment Allocation" screen displays the "Port Allocation" screen. For partition modification, information that is already set is displayed
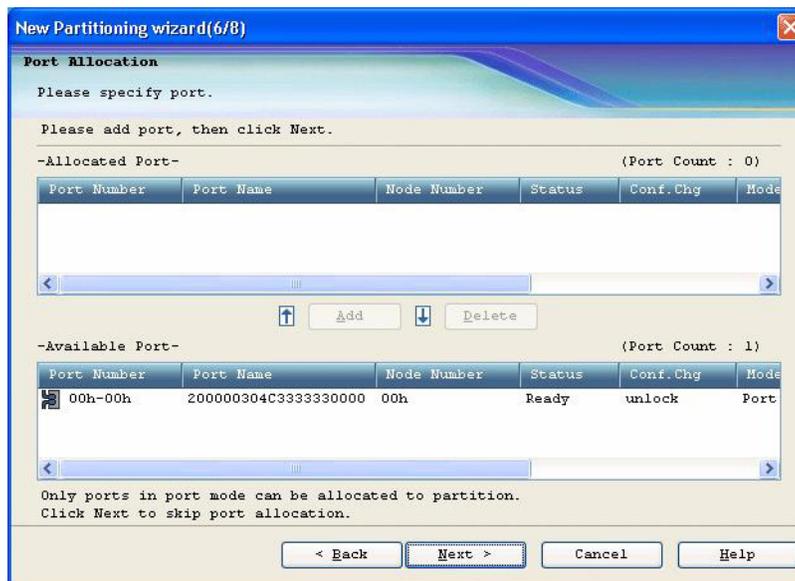

Figure 5-17: Ports to Partitions

Port Allocation allocates ports to a partition.

Allocated Port:

A list of the ports that are allocated to the partition is displayed.

[Add] button:

Selecting a port from Available Port and clicking this button adds the selected port to Allocated Port.

[Delete] button:

To delete a port that is allocated to the partition, select the port from Allocated Port and click this button. The selected port is added to Available Port.

Available Port:

A list of ports that can be allocated to the partition is displayed.

[Next] button:

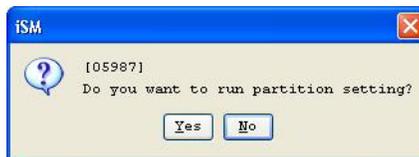The next screen is displayed.

[Back] button:

Returns to the previous screen.

[Cancel] button:

Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

- Actions on "Port Allocation" screen errors

  If errors occur in the "Port Allocation" screen, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05924] Selected port is locked. Port cannot be allocated or deleted.	Check the status of the port. It is impossible to allocate/delete the port locked by the configuration setting operation guard function. It is possible to allocate/delete it by releasing the state of the lock.
[05934] The logical disks that are assigned to the LD Sets that contain the selected ports are not allocated to the partition. The ports that must be allocated to this partition are not selected. Because logical disks and ports of the same LD Set must be allocated to the same partition, please add the following ports to this partition. Port Number:	The logical disks of the LD Set using the selected port are not allocated to the same partition. Change the port allocation status to allocate the port and logical disks to the same partition.

- If a pool is allocated to a partition, a port that is assigned to the same LD Set as the logical disks of that pool must also be allocated to the same partition as the pool.
- A port in WWN mode is not displayed in [Available Port] because it cannot be allocated.

6. Confirming partition setting information

Clicking the [Next] button in the "Port Allocation" screen displays the "Allocation Information" screen.
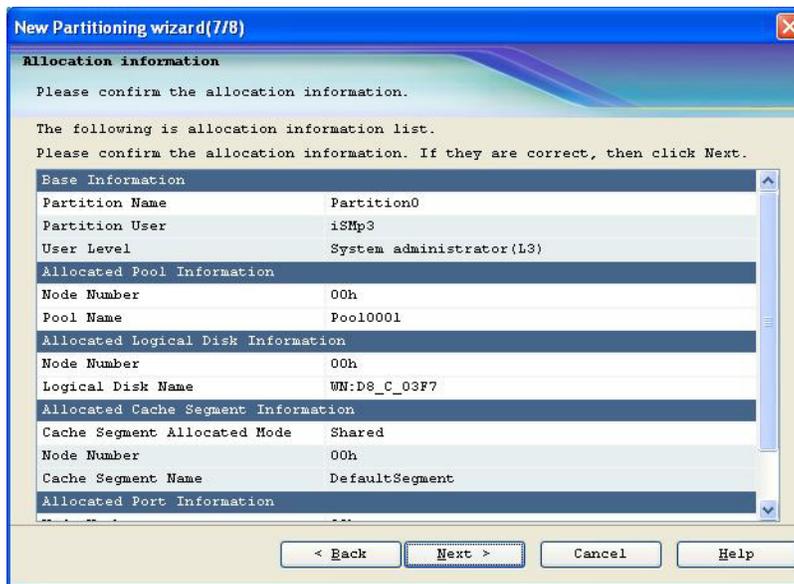
Figure 5-18: Confirmation of Partition Setting

[Next] button:

An execution inquiry message is displayed.

Figure 5-19: Execution Inquiry

[Back] button:

Returns to the previous screen.

[Cancel] button:

Displays a termination inquiry message and returns to the "Partition Information List" screen after wizard termination.

7. Completion of partition creation or modification

If partition creation or modification succeeds, the following screen is displayed.
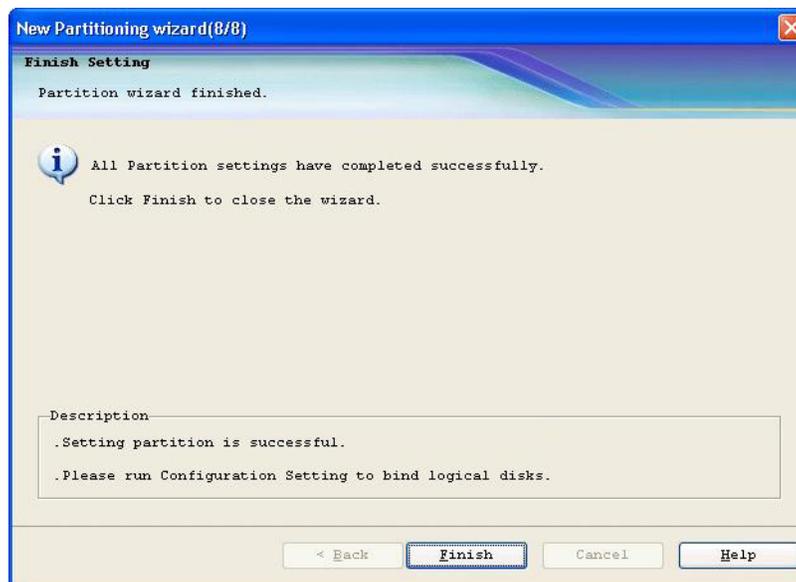
Figure 5-20: Completion of Partition Setting

[Finish] button: Terminates the wizard and returns to the "Partition Information List" screen.

If partition creation or modification fails, the following screen is displayed.

Figure 5-21: Failure of Partition Creation

Error Message	Description and Action
Start process	The setting displayed failed.
Disk Capacity Allocation (Pool Allocation)	If partition setting failed, check the status of the disk array unit in the main screen and execute the partitioning wizard again.
Disk Capacity Allocation (Logical Disk Allocation)	
Cache Segment Allocation	
Port Allocation	
Finish process	
User Allocation (Base Setting)	Check whether the user whose user allocation failed, and execute the partitioning wizard again. (Even when user allocation fails, partition creation and resource addition/deletion succeed.)
[05221] Timeout has occurred.	Check the status of the network with the SnapSAN Manager client and the status of the SnapSAN Manager client and execute the partitioning wizard again. If a cause cannot be identified, collect SnapSAN Manager fault information.

Deleting Partitions

A partition is deleted by selecting the partition from the "Partition Information List" screen and clicking the [Delete] button
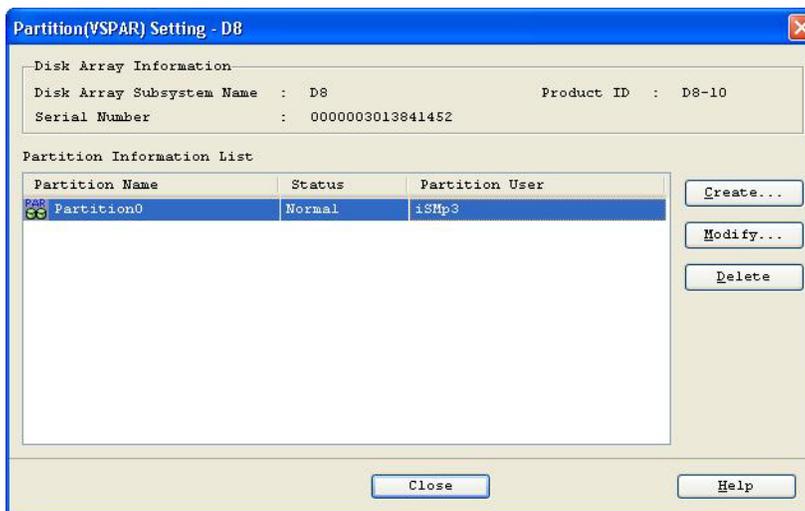
Figure 5-22: Partition Deletion

<Partition deletion procedure>

    a. Select the partition you wish to delete.

    b. Click the [Delete] button.

    c. A partition deletion inquiry message is displayed.

Figure 5-23: Partition Deletion Inquiry

    d. If deletion succeeds, the completion message below is displayed

    • Actions on partition deletion errors

    If errors occur in partition deletion, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05200] **Failed to get information.**	Communication with the SnapSAN Manager server failed for a reason such as communication timeout. Check the status of the server and reconnect.
[05936] **The partition that contains re-configuration LD cannot be deleted.**	Replacement by the performance optimization function is in progress for a logical disk in the partition. It is possible to delete the partition after completion of replacement.
[05901] **Failed to delete partition.**	Check the status of the disk array.

Change Pool Attribute Screen

The change operation of partition allocation attribute of pools is performed from the "Change Pool Attribute" screen. Changing an exclusive pool to a shared pool on this screen enables the partition allocation by logical disk.

1. Starting the Change Pool Attribute screen

    The Change Pool Attribute screen is started by either of the procedures below.

    • Clicking the [Change Pool Attribute] button of the "Disk Capacity Allocation (Pool Allocation)" screen

    • Clicking the [Change Pool Attribute] button of the "Disk Capacity Allocation (Logical Disk Allocation)" screen
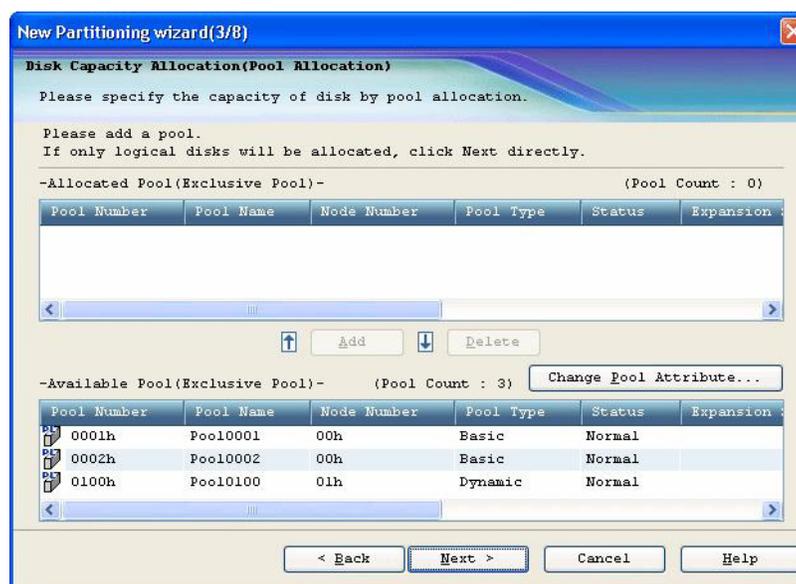
Figure 5-24: Disk Capacity Allocation
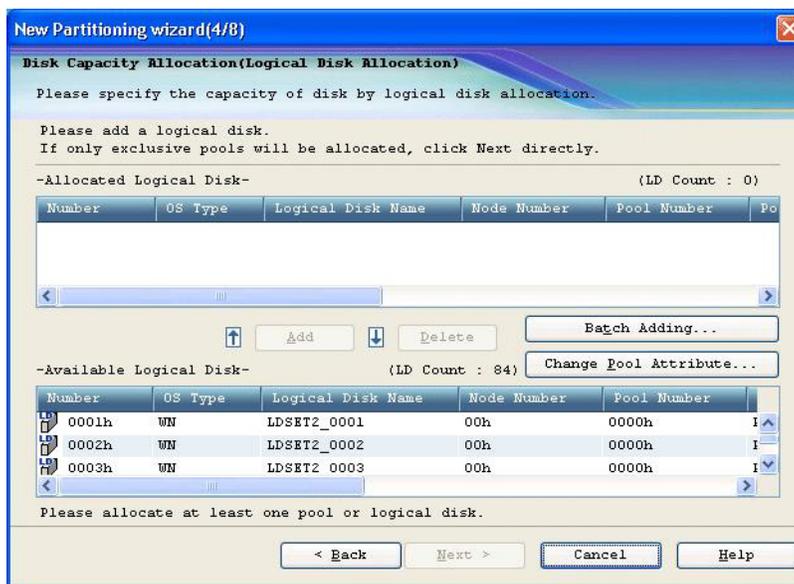
Figure 5-25: Disk Capacity Allocation LD

Use the displayed screen to change the partition allocation attribute of pools
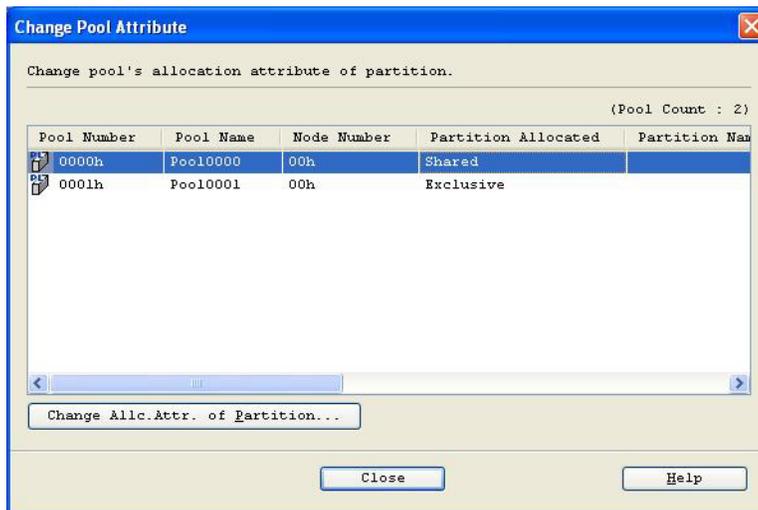
Figure 5-26: Change Pool Attribute

Pool List

A list of pools of which partition allocation attribute can be changed.

Multiple pools can be selected at the same time. However, the partition allocation attribute can be changed only when the partition allocation attribute of the selected pools is the same.

[Change Alloc.Attr. of Partition] button:

Changes the partition allocation attribute of the selected pools. The operation cannot be performed when there are no pools of which partition allocation attribute can be changed or when "exclusive" and "shared" pools are mixed.

[Close] button:

Closes the screen.

Procedure for changing the partition allocation attribute of pools

1. Select the pools that you want to change the partition allocation attribute.

2. Click the [Change Alloc.Attr. of Partition] button.

3. The "Change Allocation Attribute of Partition" screen is displayed.
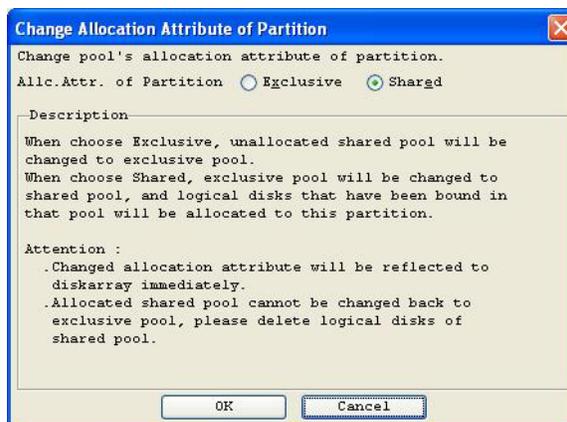
Figure 5-27: Change Allocation Attribute of Partition

Alloc.Attr. of Partition:

Specify the partition allocation attribute of the pools. The attribute being set has been selected by default.

Exclusive:

Changes shared pools to which logical disks have not been allocated to exclusive pools.

Shared:

Changes exclusive pools to shared pools and also allocates the bound logical disks to the partition.

[Cancel] button:

Closes the screen and returns to the "Change Pool Attribute" screen.

4. Clicking the [OK] button in this dialog makes the settings to the disk array.

5. While setting, the dialog below is displayed.
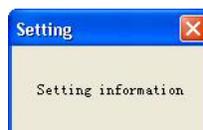
Figure 5-28: Setting Information

6. When setting is succeeded, the "Change Allocation Attribute of Partition" screen is closed and the completion message below is displayed.

Figure 5-29: Success

Clicking the [OK] button in this dialog returns to the "Change Pool Attribute" screen.

7. The information having been changed is displayed in the "Change Pool Attribute" screen.

• Actions on errors at change of partition allocation attribute of pools

If errors occur at change of partition allocation attribute, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05906] Failed to change pool's attribute.	Check the status of the disk array and execute again.

Change of partition allocation attribute of pools is immediately reflected to the disk array.Be very careful when changing the pool attribute because a shared pool to which logical disks have been allocated cannot be changed back to an exclusive pool. It is possible to change a shared pool to an exclusive pool by deleting all the logical disks of the shared pool from the partition. If other pools and logical disks do not exist in the partition, other than the shared pool to which the logical disks are allocated, the logical disk allocation cannot be cancelled. In this case, it is possible to change a shared pool to an exclusive pool by deleting the partition. An exclusive pool which has been allocated to a partition and to which no logical disks have been bound cannot be converted to a shared pool.

Cache Segment Setting Screen

The operations of cache segment definition, modification, and deletion are performed from the "Cache Segment Setting" screen.

Defining cache segments

1. Clicking the [New] button of the "Cache Segment Setting" screen displays the "Cache Segment - New" screen.
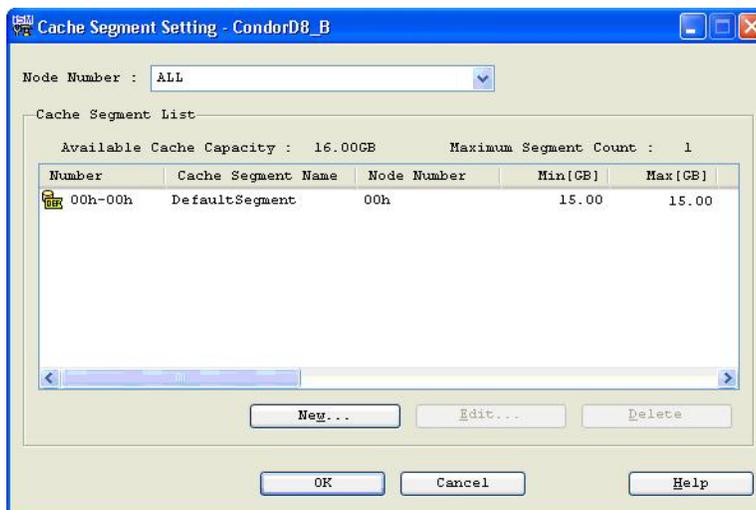
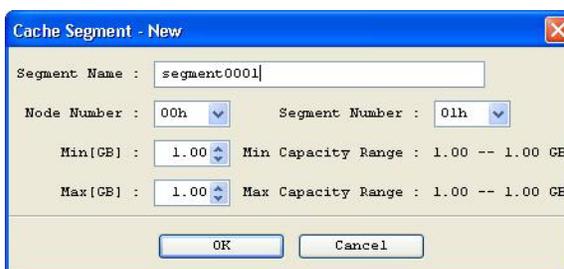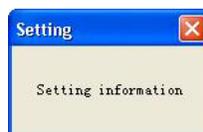**Figure 5-30: Cable Segment Setting**

Figure 5-31: New Cache Segment

2. Change Segment Name, Node Number, Segment Number, Min [GB], and Max [GB] as needed.

3. Confirm that there are no mistakes in the contents and click the [OK] button.

4. Information for the newly defined cache segment is displayed in grey.

5. To define multiple cache segments, repeat Steps 1-3.

6. Confirm that the cache segment created is added to the "Cache Segment Setting" screen and click the [OK] button. The confirmation message below is displayed.
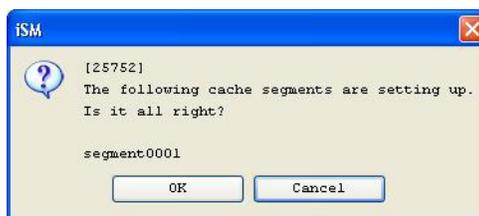
Figure 5-32: Confirmation

Clicking the [OK] button in this dialog makes the settings to the disk array.

While setting, the dialog below is displayed.

Figure 5-33: Setting Information

7. When setting is finished, the completion message below is displayed.

Figure 5-34: Setting Successful

8. Clicking the [OK] button in this dialog closes the "Cache Segment Setting" screen.

• Actions on cache segment definition errors

If errors occur in cache segment definition, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05917] The value is not specified: cache segment name.	Specify a segment name.
[25353] There is some mistake when input cache segment name. Cache segment name consists of alphanumeric, "/" or "_". Cache segment number: xxh	A value that cannot be set in a cache segment name was input. Input a cache segment name made up of single-byte alphanumeric, "/", and "-" characters.
[25354] The cache segment with the same name has existed. Please input another name. Cache segment number: xxh,xxh	A cache segment of the same name already exists. A name that does not duplicate cache segments that are already set must be input.
[25355] Specified maximum/minimum capacity is wrong value. Please specify the capacity which is multiple of 0.25 GB. Cache segment name: nnnn	Re-enter a maximum capacity or minimum capacity value that is a multiple of 0.25 GB.

Error Message	Description and Action
[25358] **Specified maximum/minimum capacity is wrong value.Please specify the capacity according to the following rule: maximum capacity ³ minimum capacity. Cache segment name: nnnn**	Re-enter a numeric value in the range "1.00 to xx.xx" displayed in the dialog.
[25360] **Failed to setting the cache segment.**	Check the status of the disk array and set it again.
[25372] **Locked logical disks are assigned to selected cache segment.** **The setting of the cache segment cannot be changed.**	Check the status of logical disks assigned to the cache segment. It is impossible to set the cache segment while configuration change of logical disks has been locked. It is possible to set the cache segment by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.

Modifying cache segments

1. Selecting a cache segment from the "Cache Segment Setting" screen and clicking the [Edit] button displays the "Cache Segment - Edit" screen.
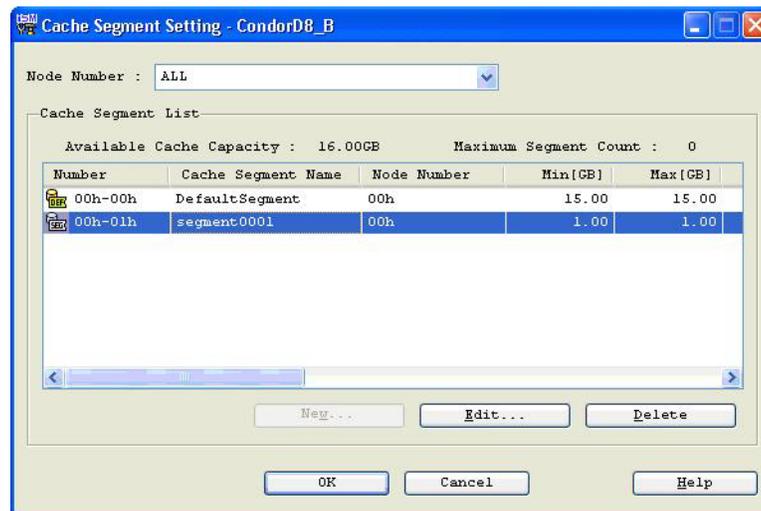
Figure 5-35: Cache Segment
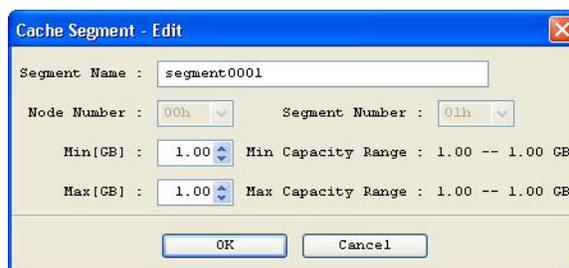
Figure 5-36: Cache Segment Change

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2. Modify Segment Name, Min [GB], and Max [GB] as needed.

3. Confirm that there are no mistakes in the contents and click the [OK] button.

   Information for the changed cache segment is displayed in grey.

   To change multiple cache segments, repeat Steps 1-3.

4. Confirm that cache segment modifications are reflected in the "Cache Segment Setting" screen and click the [OK] button. The confirmation message below is displayed.
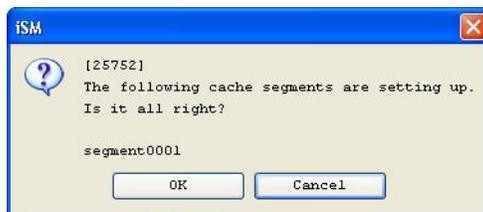

Figure 5-37: Cable Segments Setup

Clicking the [OK] button in this dialog makes the settings to the disk array.

While setting, the dialog below is displayed.
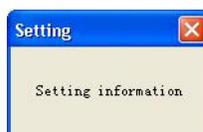
Figure 5-38: Setting Information

5. When setting is finished, the completion message below is displayed.

Figure 5-39: Setting Successful

Clicking the [OK] button in this dialog closes the "Cache Segment Setting" screen.

Actions on cache segment modification errors

If errors occur in cache segment modification, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05917] The value is not specified: cache segment name.	Specify a segment name.

Error Message	Description and Action
[25353] There is some mistake when input cache segment name. Cache segment name consists of alphanumeric, "/" or "_". Cache segment number: xxh	A value that cannot be set in a cache segment name was input. Input a cache segment name made up of single-byte alphanumeric, "/", and "-" characters.
[25354] The cache segment with the same name has existed. Please input another name. Cache segment number: xxh,xxh	A cache segment of the same name already exists. A name that does not duplicate cache segments that are set must be input.
[25355] Specified maximum/minimum capacity is wrong value. Please specify the capacity which is multiple of 0.25 GB. Cache segment name: nnnn	Re-enter a maximum capacity or minimum capacity value that is a multiple of 0.25 GB.
[25358] Specified maximum/minimum capacity is wrong value. Please specify the capacity according to the following rule: maximum capacity ^{3} minimum capacity. Cache segment name: nnnn	Re-enter a numeric value in the range "1.00 to xx.xx" displayed in the dialog.
[25360] Failed to set the cache segment.	Check the status of the disk array and set it again.
[25372] Locked logical disks are assigned to selected cache segment. The setting of the cache segment cannot be changed.	Check the status of logical disks assigned to the cache segment. It is impossible to change the setting of the cache segment while configuration change of logical disks has been locked. It is possible to change the setting of the cache segment by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.

6. Deleting cache segments

    a. Selecting a cache segment from the "Cache Segment Setting" screen and clicking the [Delete] button displays the confirmation message below.
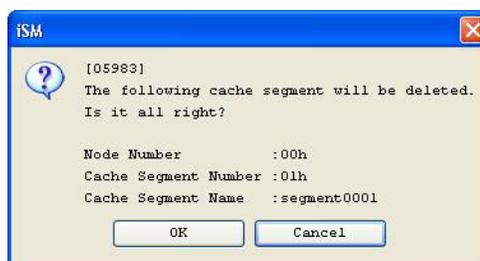
Figure 5-40: Cache Segment Setting

Figure 5-41: Cache Segment Deletion

b. Confirm that there are no mistakes in the contents and click the [OK] button.

Information for the selected cache segment is displayed in grey, with hyphens (-) displayed in columns other than [Number], [Cache Segment Name], and [Node Number].

To delete multiple cache segments, repeat operations (i) though (ii).

c. Confirm that cache segment modifications are reflected in the "Cache Segment Setting" screen and click the [OK] button. The confirmation message below is displayed.
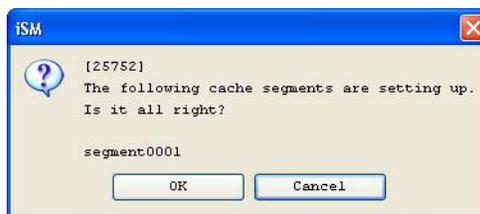
Figure 5-42: Confirmation

Clicking the [OK] button in this dialog makes the settings to the disk array.

While setting, the dialog below is displayed.
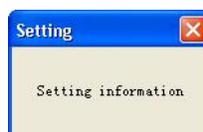
Figure 5-43: Setting Information

d. When setting is finished, the completion message below is displayed.

Figure 5-44: Completion

Clicking the [OK] button in this dialog closes the "Cache Segment Setting" screen.

- Actions on cache segment deletion errors

    If errors occur in cache segment deletion, dialogs containing the messages shown below are displayed. Take the action corresponding to each error.

Error Message	Description and Action
[05932] Cannot delete selected cache segment because it is allocated to a partition. Partition name:	The selected cache segment is allocated to the partition. Delete the partition after deleting it from the partition.
[25360] Failed to set the cache segment.	Check the status of the disk array and set it again.
[25373] Locked logical disks are assigned to selected cache segment. The cache segment cannot be deleted.	Check the status of logical disks assigned to the cache segment. It is impossible to delete the cache segment while configuration change of logical disks has been locked. It is possible to delete the cache segment by releasing the state of the lock. The lock operation of configuration change is performed from LD Administrator.

Scope of Configuration Setting Function Operations

In the SnapSAN Manager configuration setting function, different function operations are available to storage group users and partition users. The table below shows the range of operations.

Configuration Setting Function (*1)		Storage group user (*2)	Partition User (*3)
LD Batch Binding	Pool/LD/Spare Batch Binding	✓	-
Nickname Batch Setting	Name Setting of Disk Array/Logical Disk/Port	✓	✓* (*4)
Replication Batch Setting	Replication Pair Batch Setting	✓	✓*
Pool Setting	Pool Bind/Unbind/Expansion	✓	-
	Change Pool Time	✓	-
	Change Pool Name	✓	-
	Set Eco Mode	✓	-
	Change Alloc. Attribute of Partition	✓	-
	Change Actual Capacity Threshold	✓	✓*
LD Setting	LD Bind/Unbind/Expansion	✓	✓* (*5*8*9)
	Change Bind Time	✓	-
	Change Logical Disk Name	✓	✓* (*5)
	Setting Cache	✓	✓* (*5*8)
	Change Quota/Change Threshold	✓	✓* (*10)
Spare	Spare Bind/Unbind	✓	-
Disk Array Setting	Setting/Changing Disk Array/Port Name	✓	-
	Setting Platform	✓	-
	Setting Network	✓	-
	Unlocking License	✓	-
	Setting Host Connecting Port	✓	-
	Change Time	✓	-
	Get Log	✓	-
	Copy Back Mode	✓	-
	Setting Host Recognize Volume	✓	-
	Write Cache Configuration/Display	✓	-
	Alarm Cancelation	✓	-
Snapshot	Snapshot Reserve Area (SRA) Bind/Unbind/Expansion/Change Threshold	✓	✓*
	Generation Adding	✓	✓*
	LV Binding	✓	✓*

Configuration Setting Function (*1)		Storage group user (*2)	Partition User (*3)
Access Control Setting	Newly Creating LD Set	✓	✓*
	Adding/Replacing/Deleting Path Information	✓	✓*
	Newly Creating/Adding/Deleting Logical Disk	✓	✓*
	Change Port Mode	(*6)	-
	Beginning Access Control	✓	-
LD Administrator Setting	Newly Setting/Adding/Saving/Reserving Logical Disk	✓	✓*
	Changing Group of Logical Disks	✓	✓*
	Initialization of Logical Disk	✓	✓*
	Setting OS Type/LD Name	✓	✓*
	Configuration Setting Operation Guard	✓	✓* (*7)
Get Configuration Information	Get Configuration Information	✓	✓
Quick Configuration	Batch License Unlock	✓	✓
	LD Binding (FC)	-	✓
	LD Binding (iSCSI)	-	✓

✓: Capable of operation -: Incapable of operation

✓*: Capable of operation only for resources allocated to partition

*1) The configuration setting function is for the system administrator (role: administrator).

*2) Storage group user: User who manages the entire disk array.

*3) Partition user: User who manages a given partition.

*4) Excluding disk array name, and port name.

*5) Excluding System Volume.

*6) Excluding ports that were allocated to partition.

*7) Excluding disk array configuration change.

*8) Excluding the case when allocated by the logical disk allocation method.

*9) The binding or unbinding to a shared pool is impossible.

*10) The quota cannot be changed if the logical disk allocation method is used.

Displaying Partition Information

Configuration Display Command (iSMview)

Configuration display command options that correspond to partition information are as follows.

After a disk array is specified in the iSMview -d option, the option below can operate.

- -pa option: Displays the partition list information of the specified disk array.
- -pam option: Displays all the detailed information of the specified partition.
- -all option: Display all information of the specified disk array.

Displaying partition list information

When the -pa option is specified, the partition list information for the specified disk array is displayed.

Each item is explained below.

```
# iSMview -pa Storage001

--- Virtual Storage Partition Information ---
Partition No.(h)  Partition Name  Partition State
0000              Partition1      ready
0001              Partition2      ready
```

Virtual Storage Partition Information

Partition information set in the disk array is displayed.

Partition No.(h): Partition numbers.

Partition Name: Partition names.

Partition State: Partition statuses.

ready: Normal

ready(maint.): Normal(Maintenance)

attn.(invalid conf.): Attention(Invalid Configuration of Partition)

fault: Fault

Displaying Detailed Partition Information

When the -pam option is specified, the detailed information of the specified partition is displayed.

Each item is explained below.

```
# iSMview -pam Storage001 Partition1

--- Virtual Storage Partition Detail Information ---
Partition No.(h)     : 0000
Partition Name       : Partition1
Partition State      : ready

--- Pool List ---
Pool No.(h) Pool Name Pool Type Node No.(h) PD Type Pool State Partition Allocated
0000        Pool0000  basic     00          SAS     ready      share
0001        Pool0001  dynamic   00          ATA     ready      exclusion

--- Cache Segment List ---
Number(h)  Segment Name  Segment State  Partition Allocated
00-01      Segment1      ready          exclusion

--- Port List ---
Port No.(h)  Port Name         Platform Port Mode Node No.(h) Conf.Chg Port State Partition
                                                                                   Allocated
00-00        100000000130100   WN       port      00          Lock     ready      exclusion
00-01        100000000130200   NX       port      00                   ready      exclusion

--- LD Set List ---
Platform  LD Set Name
WN        WIN_SET1
LX        LIN_SET1
```

Virtual Storage Partition Detail Information

The detailed partition information set in the disk array is displayed.

Partition No.(h): Partition numbers

Partition Name: Partition names

Partition State: Partition statuses

ready: Normal

ready(maint.): Normal(Maintenance)

attn.(invalid configuration of partition.):

Attn.(Invalid Configuration of Partition)

fault: Fault

Pool List

A list of pools allocated to the partition is displayed.

Pool No.(h): Pool numbers

Pool Name: Pool names

Pool Type: Pool types

basic: Basic pool

basic(SYV): Pool dedicated to System Volume

dynamic: Dynamic pool

Node No.(h): Node numbers of the pools

PD Type

Displays one of the following as the type of the PD configuring the pool.

FC: FC attribute

ATA: ATA attribute

SAS: SAS attribute

SSD: SSD(SAS) attribute

SSD(ATA): SSD(ATA) attribute

Pool State: Pool statuses

ready: The pool is in normal state.

attn.(reduce): The failing PD has been disconnected (reduced).

attn.(rebuilding): The rebuilding of data is in progress.

attn.(copy back): A spare is being copied in redundant state.

attn.(preventive copy):

Preventive exchange processing is in progress.

attn.(stop): The pool is stopped.

fault: A functional error has occurred.

Partition Allocated: Displays the partition allocation attribute.

share: Shared

exclusion: Exclusive

Cache Segment List

A list of cache segments allocated to the partition is displayed.

Number(h): Node_number-cache_segment_number

Segment Name: Cache segment names

Segment State: Partition statuses

Ready: Normal

attn.(reduce): Attention

fault: Abnormal

Partition Allocated: Displays the partition allocation attribute.

share: Shared

exclusion: Exclusive

Port List

A list of ports allocated to the partition is displayed.

Port No.(h): Port numbers.

Port Name: Port names.

Platform: Platforms.

Port Mode Port modes.

Node No.(h): Node numbers of ports.

Conf.Chg: Displays one of the following as the setting state of configuration setting operation guard for the port.

Lock: Configuration setting operation guard has been set.

Nondisplay: Configuration setting operation guard has not been set.

Port State: Port statuses.

ready: Normal

fault: Abnormal

offline: Not installed

attention

(nolicense): License not granted

Partition Allocated: Displays the partition allocation attribute.

share: Shared

exclusion: Exclusive

LD Set List

A list of LD Sets allocated to the partition is displayed.

Platform: LD Set platforms.

LD Set Name: LD Set names.

Displaying Partition Information (-all specification)

When the -all option is specified, the partition information for the specified disk array is displayed.

For the -all option, the list displayed for the -pa option is first displayed and then the detailed information of each partition is displayed in the same format as the -pam option.

```
# iSMview -all Storage001

  (Omitted)

--- Virtual Storage Partition Information ---
Partition No.(h)   Partition Name
0000               Partition1
0001               Partition2

--- Virtual Storage Partition Detail Information ---
Partition No.(h)     : 0000
Partition Name       : Partition1
Partition State      : ready

--- Pool List ---
Pool No.(h) Pool Name  Pool Type  Node No.(h) PD Type  Pool State   Partition
                                                                    Allocated
0000        Pool0000   basic      00          SAS      ready        share
0001        Pool0001   dynamic    00          ATA      ready        exclusion

  (Omitted)

--- Virtual Storage Partition Detail Information ---
Partition No.(h)     : 0001
Partition Name       : Partition2
Partition State      : ready

--- Pool List ---
Pool No.(h) Pool Name  Pool Type  Node No.(h) PD Type  Pool State   Partition
                                                                    Allocated
0000        Pool0002   basic      00          SAS      ready        share

  (The rest is omitted)
```

Configuration Display Command (iSMcc_view)

The configuration display command (iSMcc_view) can operate independently on a server on which the SnapSAN Manager is not installed. The command displays the settings of a disk array connected through a fibre channel (FC), subsystem resource status, LD configuration, and LD status. This command is enabled by installing the "Volume List command" package.

To execute the configuration display command (iSMcc_view), a volume list must be created.

Partition Information File Output Function

It is possible to get a file of disk array-related configuration information using the SnapSAN Manager configuration setting screen, configuration display command (iSMview/iSMcc_view), and configuration information file output command (iSMcsv/iSMcc_csv). Partition information is included in the obtained disk array configuration information.

SnapSAN Manager Configuration Setting Screen

There is no difference in the configuration information that storage group users and partition users get.

Configuration Display Command (iSMview)

Operating the configuration display command (iSMview) with the -all option gets configuration information.

The configuration information obtained using this option can be output to a text format file.

In the description example shown below, all configuration information of the disk array obtained using the -all option will be output to a text file.

Configuration Information File Output Command

```
> iSMview -all Storage001 >> configinfo.txt
```

(iSMcsv)

The configuration information file output command (iSMcsv) outputs the configuration information of a disk array in the CSV format. Under the directory specified by this command, a directory indicated with the date and time is created and the files are output to it.

The files corresponding to the partition information are shown below.

File Name	Description
VSPARList.csv	Information about partitions
VSPAR-Pool.csv	Information about correspondence between partitions and pools
VSPAR-LD.csv	Information about correspondence between partitions and LDs
VSPAR-CacheSegment.csv	Information about correspondence between partitions and cache segments
VSPAR-Port.csv	Information about correspondence between partitions and ports
VSPAR-LDSet.csv	Information about correspondence between partitions and LD Sets *This file is not output when the AccessControl license is not applied.

Information about Partitions (VSPARList.csv)

Outputs a list of partitions.

The display items are as follows:

```
Partition No.(h)    Partition Name
0001                Partition1
0002                Partition2
```

Partition No.(h): Partition number

Partition Name: Partition name

Information about Correspondence between Partitions and Pools (VSPAR-Pool.csv)

Outputs information about correspondence between partitions and pools.

The display items are as follows:

```
Partition Name   Pool No(h)   Partition Allocated
Partition1       0000         exclusion
Partition2       0001         share
```

Partition Name: Partition name

Pool No(h): Pool number

Partition Allocated: Partition allocation attribute

Information about Correspondence between Partitions and LDs (VSPAR-LD.csv)

Outputs information about correspondence between partitions and LDs.

The display items are as follows:

```
Partition Name   LDN(h)
Partition1       0000
Partition1       0001
Partition1       0002
Partition2       0100
Partition2       0101
```

Partition Name: Partition name

LDN(h): LD number

Information about Correspondence between Partitions and Cache Segments (VSPAR-CacheSegment.csv)

Outputs information about correspondence between partitions and cache segments.

The display items are as follows:

```
Partition Name   Segment Number(h)   Partition Allocated
Partition1       00-00               share
Partition2       01-01               exclusion
```

Partition Name: Partition name

Segment Number(h): Node number-cache segment number

Partition Allocated: Partition allocation attributes

Information about Correspondence between Partitions and Ports (VSPAR-Port.csv)

Outputs information about correspondence between partitions and ports.

The display items are as follows:

```
Partition Name  Port No.(h)  Partition Allocated
Partition1      00-00        exclusion
Partition1      00-01        share
Partition2      01-00        exclusion
Partition2      01-01        share
```

Partition Name: Partition name

Port No.(h): Port number

Partition Allocated: Partition allocation attributes

Information about Correspondence between Partitions and LD Sets (VSPAR-LDSet.csv)

Outputs information about correspondence between partitions and LD Sets.

The display items are as follows:

```
Partition Name  Platform  LD Set Name
Partition1      WN        LDSET1
Partition2      WN        LDSET2
```

Partition Name: Partition name

Platform: Platform

LD Set Name: LD Set name

Configuration Display Command (iSMcc_view)

Operating the configuration display command (iSMcc_view) with the -all option gets configuration information.

The configuration information obtained using this option can be output to a text format file.

The following is a description example that all configuration information of the disk array obtained using the -all option is output to a text file.

Configuration Information File Output Command

```
> iSMcc_view -all Storage001 >> configinfo.txt
```

(iSMcc_csv)

The configuration information file output command (iSMcc_csv) can operate independently on a server on which the SnapSAN Manager is not installed. The command outputs the configuration information of a disk array connected through a fibre channel (FC) in the CSV format.

To execute the configuration information file output command (iSMcc_csv), a volume list must be created.

Notes

Partitioning Function Specifications

Specifications for elements of the partitioning function are as follows.

    a. A maximum of 127 partitions can be constructed per disk array.

    b. A maximum of 100 storage group users and a maximum of 128 partition users can be registered in SnapSAN Manager server.

       A maximum of 32 users can log in from SnapSAN Manager clients simultaneously.

    c. A maximum of 8 cache segments can be defined per node.

       However, since the minimum value for cache segment capacity is 1 GB, the number may be less than 8 and depends on the implemented cache capacity.

Parameter	Specification	Supplement
Number of partitions	127	Maximum number per disk array
Number of storage group users	100	Maximum number as SnapSAN Manager servers
Number of partition users	128	Maximum number as SnapSAN Manager servers
Number of cache segments	8	Maximum number per node

Installation and Construction

Specifications for partitioning function installation and construction are documented below.

(1) This function can be used in the SnapSAN S3000/S5000.

(2) In an environment in which a disk array is monitored by FC connection from the SnapSAN Manager server, the tasks below must be completed for the disk array before starting Access Control using the Setting Access Control operation of configuration setting so that it will be in a state in which logical disks can be recognized by the management server on which SnapSAN Manager server is installed.

- Creation of LD Set for management server
- Setting of link between LD Set of management server and path information
- Assignment of logical disks to LD Set of management server

(3) If the access mode of a port has been set to WWN mode, since that port is a resource shared by the entire disk array, it cannot be allocated to a specific partition.

It is possible to operate without allocating a WWN mode port to a partition and have that port be shared.

(4) When allocating a pool (exclusive pool) to a partition, LD Sets to which logical disks bound to that pool are assigned are allocated along with the pool. Moreover, all ports linked to these LD sets (in the case of Port mode ports) and logical disks (in the case of logical disks in a shared pool) must be allocated to the same partition.

LD sets of the same name cannot be allocated to multiple different partitions.

(5) When allocating logical disks (logical disks in a shared pool), LD Sets to which the logical disks are assigned are allocated along with the logical disks. Moreover, all ports linked to these LD sets (in the case of Port mode ports) and pools (exclusive pools) must be allocated to the same partition.

LD sets of the same name cannot be allocated to multiple different partitions.

(6)For the nickname that is set for a logical disk within a partition, it is recommended that a nickname from which the business can be identified be set. Among disk arrays subject to SnapSAN Manager server monitoring, nicknames that duplicate ones that have already been set cannot be set.

(7) The functions below cannot be used concurrently with the VSPAR Setting or Cache Segment Setting function.

- Configuration Setting
- Easy Configuration
- Initialization Wizard
- VSPAR Setting
- Cache Segment Setting

Moreover, the functions below cannot be used concurrently with the User Setting function.

- VSPAR Setting
- Cache Segment Setting

(8) Note the following if a disk array is made up of multiple nodes.

- Cache memory is implemented by node and cache segments are defined by node. Moreover, only logical disks in the same node can be used for a defined cache segment area. Although cache segments and pools of each node can be allocated to a partition, cache segments and the logical disks that use them are independent for each node. The cache segment area cannot be used by logical disks of different nodes or otherwise shared between nodes.

Notes for Operation

Notes for operating the partitioning function are documented below.

(1) A partition user is capable of operations such as configuration display, status monitoring, and configuration setting that are limited to partitions for which operation authority has been given and their resources. However, that user cannot perform maintenance tasks for the disk array if an event or fault requiring maintenance occurs at a partition resource. Entrust disk array maintenance tasks to a maintenance engineer as needed by contacting a system administrator (L3) storage group user.

(2) When configuration setting is performed by a partition user, monitoring temporarily stops for the entire disk array during configuration setting tasks. Moreover, because of this, the latest information cannot be referenced, set, or manipulated by other SnapSAN Manager clients.

(3) While user setting tasks are being performed by the operations below, it may not be possible to connect to the SnapSAN Manager server from an SnapSAN Manager client. If that is the case, try to connect again after awhile.

- Partition user creation, editing, or deletion (Operation from User Setting screen)
- Partition user addition to or deletion from partition (Operation from partitioning wizard)

(4) If communication between the SnapSAN Manager server and SnapSAN Manager client or between the management server and disk array is cut while an operation such as partition creation, modification, or deletion, LD Set creation or deletion, or setting or changing links between LD Sets and path information is being performed, there may be inconsistency in the configuration information of the partition being operated on.

For the partition for which configuration information is inconsistent, " " (Attn.(Invalid Configuration of Partition)) is displayed in the Partition List screen of the partitioning wizard. In this case, perform either of the operations below to restore the configuration information of the partition to a normal state.

*In a state in which there is a partition whose status is Attn.(Invalid Configuration of Partition), operations such as creation, modification, and deletion cannot be performed for other partitions, and the Setting Access Control and LD Administrator Setting screens cannot be activated. In addition, configuration setting and other functions may not operate normally.

*Operations on a partition status that is Attn.(Invalid Configuration of Partition) can be performed only by a system administrator (L3) storage group user.

- Delete and recreate the partition

  When you delete a partition status is Attn.(Invalid Configuration of Partition), resources that were allocated to that partition return to an unallocated state. Afterwards, repair the partition by creating it again.

- Modify the partition

  Perform change operations on the partition status is Attn.(Invalid Configuration of Partition) and repair the partition by reallocating the necessary resources.

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