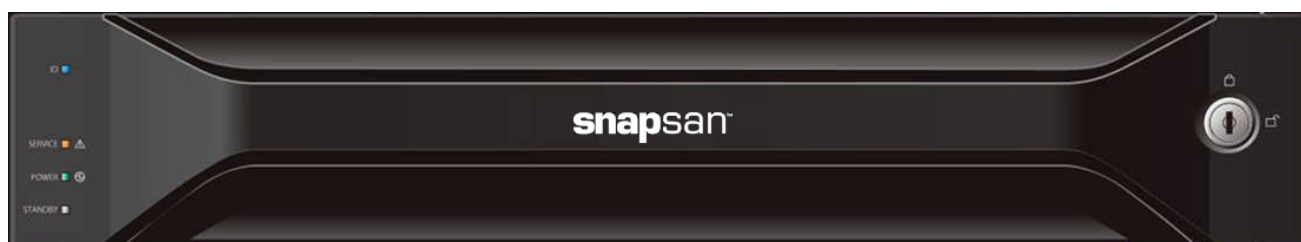# Application Note

October 2013

Configuring SnapSAN S5000 AutoTier

Summary

This application note describes how to configure AutoTier (Block-based) to optimize performance of the SnapSAN S5000 storage array.

Introduction

AutoTier (Block Based) is a new feature for analyzing I/O response from the disk array subsystem and providing information on how to improve cost performance. This is done by moving blocks of stored data to the fastest optimum device autonomously. This is based on frequency of accessing the data in order to make effective use of the devices. The two configurations options available with AutoTier are Faster-Speed Tier or Slower-Speed Tier. This document provides a guideline how to quickly setup and configure AutoTier with a single logical disk. Additional details about AutoTier are found in the AutoTier user guide.:

http://www.overlandstorage.com/pdfs/support/SnapSAN_S5000_AutoTier_User_Guide.pdf

Required Information, Tools, and Files

Before you begin these procedures, the following information, tools, and files are required.

Prerequisites

Prior to performing these procedures, ensure that you have the following:

* Overland Storage SnapSAN S5000 Disk Array must be installed and configured.

  You can get additional information on basic installation and configuration at http://support.overlandstorage.com, or by contacting Overland Storage using the information found on the Contact Us page on our web site.
* The SnapSAN S5000 must have firmware version U22R.007 and software version 082R.007.
* SnapSAN Manager Server must be installed and is running version 8.2.060.
* Verify that the following are installed on the server:
  * Java Runtime Environment (JRE)
 * SnapSAN Manager Server Web Management Interface.

Versions

The test environment used for illustration in this document uses the following versions:

* Java JRE version 7 update 40
* SnapSAN Manager Server version 8.2.060
* SnapSAN S5000 software version 082R.007
* SnapSAN S5000 firmware version U22R.007

Creating a Multi-tiered Pool

A multi-tiered pool consists of multiple pool groups with various PD/RAID types.

A sample multi-tiered pool is shown in the following image:
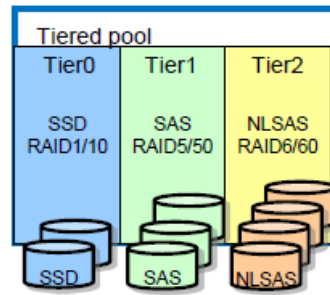
NOTE: Block-based tier feature does not support virtual capacity pools.

In a multi-tier pool:

- Up to three tiers can be created.
- The specification of tiered pools conforms to that of conventional pool groups.
- Each tier is named as:
    - Tier0 (Faster speed tier)
    - Tier1
    - Tier2 (Slower speed tier)

Perform the following tasks to create a multi-tiered pool.

Creating a Basic Pool

1. Open your browser and login to the **SnapSAN Web Management Interface**.
2. Select the **SnapSAN S5000**.
3. Navigate to **Configuration > Pool > Pool Bind** page.
4. Click **Show Pool List**.

5. Select items from the drop-down menus for these **two** options:
    - Physical disk type
    - RAID type

6. Select **one** of the following options:
    - **Auto disk selection**
    - **Manual disk selection**
7. Click **Next**.
8. Verify the basic **settings**.
    If you need to modify the default settings, proceed to Basic Pool Advanced Settings.
9. Click **Set**.
10. Click **Yes** to complete the binding.

Basic Pool Advanced Settings

If the default settings need modification, click **Advanced** and follow these steps:

1. Enter **both** items:
    - Pool name
    - Rebuild priority
2. Click **OK**.
3. Click **Yes**.
4. Click **Finish**.

Add a Tier and Bind a Tiered Pool

1. Use **one** of the options:
    - From the **Pool Bind Completion** screen, click **Add a tier and bind a tiered pool**.
    - From the **SnapSAN Manager Monitor** screen, navigate to **Configuration > Pool > Tier Add**.

2. Select inputs for **these** options:
  - Type of pool
  - Faster-speed tier or slower-speed tier
  - Type of physical disk
  - Type of RAID

3. Select **one** of the following:
  - **Auto disk selection**
  - **Manual disk selection**

4. Click **Calculate tier capacity**.

5. Click **Next**.

6. Verify the **basic settings**.
  If you need to modify the default settings, proceed to Add/Bind a Tier Advanced Settings.

7. Repeat Steps 1–6 (and if necessary, the Add/Bind a Tier Advanced Settings) to create **two** more tiers.

Add/Bind a Tier Advanced Settings

If the default settings need modification, click **Advanced** and follow these steps:
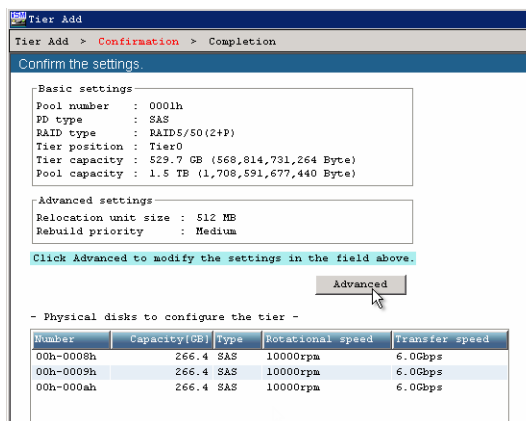
1. Enter these **options** to create a tier.
  - **Relocation unit size** – This size is used to move data between tiers.
  - **Rebuild priority** – Select a priority of **High, Medium** or **Low**.
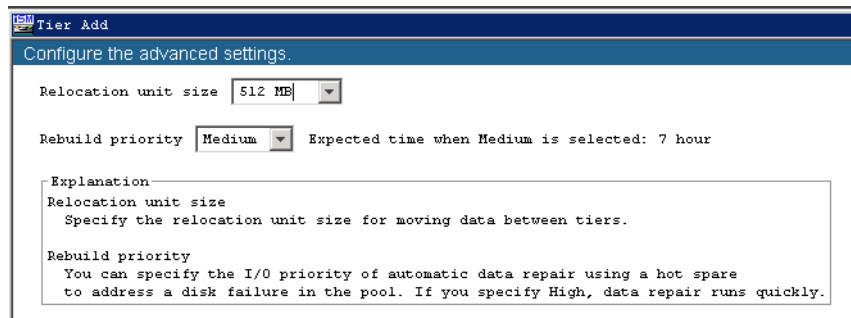
2. Click **OK**.

3. Click **Set**.

4. Click **Yes**.

5. Click **Finish**.

Creating a Logical Disk containing Multiple Tiers in the Multi-tiered Pool

Using the multi-tiered pool previously created, you now create (bind) a logical disk onto it. Depending on the access frequency, the data blocks from this logical disk move from one pool to another which is possible because the logical disk lies on top of the multi-tiered pool. The following steps define and create such a logical disk.

Binding a Logical Disk

Use these steps to bind a logical disk that consists of multiple tiers of SSD/SAS/NLSAS.

1. Use **one** of the following options:

- From the **Tier Add Completion** screen, click **Bind Logical Disk**.
- From the **SnapSAN Manager Monitor** screen, navigate to **Configuration > Logical Disk > Logical Disk Bind**.

2. Enter the following **information**:

- Number of logical disks
- Logical disk capacity
- Name of the logical disk

3. Click **Next**.

4. Verify the basic **settings**.

5. Continue with Binding Advanced Settings.

Binding Advanced Settings

Specify how the capacity is assigned to each tier with regard to the logical disk on the multi-tiered pool:

1. Click **Advanced**.

2. Enter the following information:
   - Type of logical disk
   - Number of first logical disk
   - Binding priority

3. Select the rate of capacity used by each tier that is **Capacity Ratio**.

   The pattern can be selected from the following options (the setting can be changed either at the time of or after binding a tiered pool):
   - **According to unused capacity** – Same as the unused capacity proportion of each tier in a tiered pool (default)
   - **High speed tiers take priority** – Allocate more capacity to higher speed tiers (performance-oriented logical disks)
   - **Low speed tiers take priority** – Allocate more capacity to lower speed tiers (cost-oriented logical disks)
   - **Specify capacity ratio** – Specify the proportion of the tiers to be used.

4. Click **OK**.

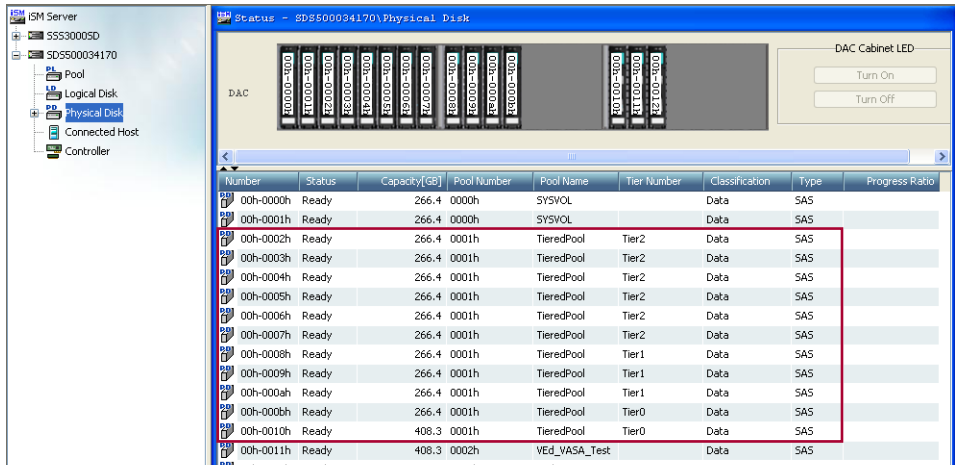5. Click **Set**.

6. Click **Yes**.

7. Click **Finish**.

The tiered pool's RAID type and physical disk type are displayed as "**Multi**".

Verifying the Physical Disks used to Create Tiers

1. From the SnapSAN Server Manager Monitor screen, select the **SnapSAN S5000**.

2. Select **Physical Disk**.

   The physical disks used to create tiers are shown in this graphic:

Assigning Logical Disk to a Host

1. Use **one** of the following options:
   - From the **Logical Disk Bind Completion** screen, click **Assign logical disks to the host**.
   - From the **SnapSAN Manager Monitor** screen, navigate to **Configuration > Host > Assignment of Logical Disk**.

2. Select the **Host** and the **Logical Disk**.

3. Click **Next**.

4. Click **Set**.

5. Click **Yes**.

6. Click **Finish**.

7. Click **Yes**.

Mount Logical Disk to a Host

1. From the host server, navigate to **Computer Management > Disk Management** to view the list of logical disks.

2. Right-click the assigned **logical disk**, and select **Online**.

Verifying the Performance when Running Heavy I/O using the I/O Meter

1. Monitor the disks using **Performance Monitor** to observe the performance of the different tiers to which the logical disk is configured.

2. From SnapSAN Manager Monitor screen, navigate to the **Options > Performance** page to view the performance details under the **Physical Disk** tab.