



Lenovo SAN Manager - Provisioning and Mapping Volumes

Lenovo ThinkSystem DS2200, DS4200, DS6200

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Introduction

The Lenovo ThinkSystem DS2200, DS4200, and DS6200 SAN products are differentiated offerings with Lenovo's Storage portfolio, providing both hardware and software feature advantages. These SAN products are designed for simplicity, speed, and scalability and availability with the perfect blend of a high performing SAN product and a very easy-to-use interface.

With simplicity at its core, the DS2200, DS4200, and DS6200 share the same software features and interface. The Lenovo SAN Manager, the operating software to manage the operational and features of the SAN products, is an easy-to-use GUI that makes complex administrative simple by automating configurations and operations. The Lenovo SAN Manager offers enterprise-class features like: Storage Tiering & Caching, Thin Provisioning, Rapid RAID Build, Snapshots, and more.

In this paper, you will learn:

- Learn about new concepts and terms for provisioning storage pools from disks and creating volumes with Lenovo SAN Manager

- Use the new Storage Management Console to define Disk Groups for a new Virtualized Pool.
- Learn how to create volumes and efficiently map them to hosts.

This brief will discuss Lenovo SAN Manager's storage pooling and mapping features using Lenovo Storage Management Console, referred to as LSMC. Refer to Figure 1 for an example of the LSMC interface.

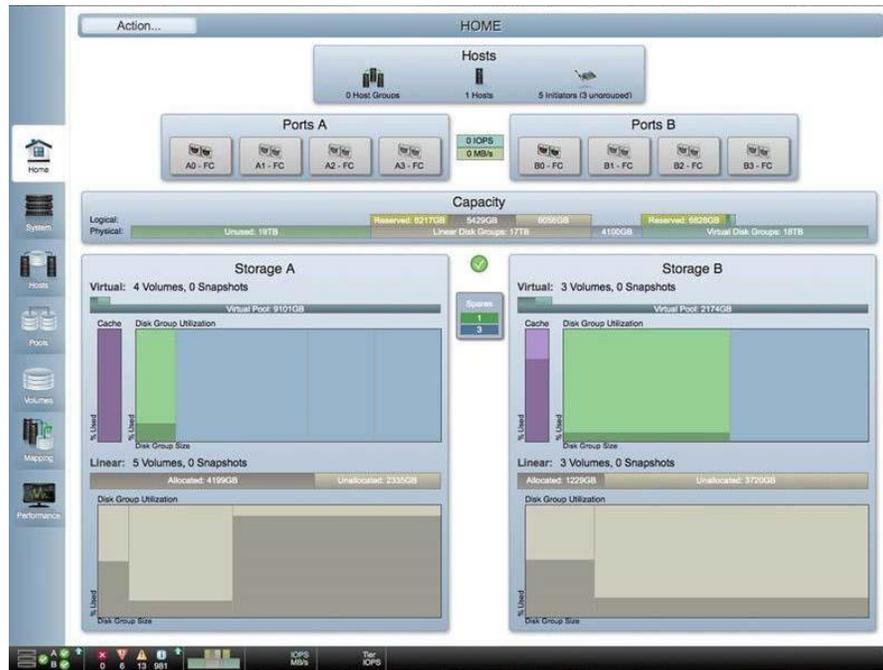


Figure 1 – LSMC Home Screen

Provisioning with LSMC Interface

With Lenovo SAN Manager, users will create storage pools by creating and adding Disk Groups. Disk Groups are similar to VDisks but can have different types – Virtual and Read Cache.

Virtual – a new methodology where volumes are managed in discrete 4MB entities (called “pages”) which enable several key new features (see Volumes section below for more information)

Read Cache – allows the customer to increase the effective controller cache size by adding SSDs as a read-cache Disk Group

This brief will focus on the Virtual Disk Groups and the new features and benefits that this enables.

Virtual Disk Groups

When creating a Virtual Disk Group, the user can specify the RAID level (RAID 1, 5, 6, 10) and which Pool the Disk Group belongs to. Disk Groups must contain like disk types: SSD, Enterprise SAS, MDL SAS. The user must select a valid group of available HDDs or SSDs for the chosen RAID type. The chunk size is automatically set to 512KB and does not need to be modified by the user. An example of the LSMC Add Disk Group Screen is shown below in Figure 2.



Figure 2- Add Disk Group Screen

Once the virtual Disk Groups are created, the Lenovo SAN Manager will create pools comprised of the individually created Disk Groups. The array utilizes an active-active controller configuration, and will create a Pool A and Pool B – each with the primary owner of Controller A and Controller B respectively. Best practices would leverage both controllers and balance the workload across the two pools.

Figure 3 is an example of the LSMC Home screen with two pools comprised of Enterprise SAS (color coded light green) and MDL SAS (color coded light blue) disk components.

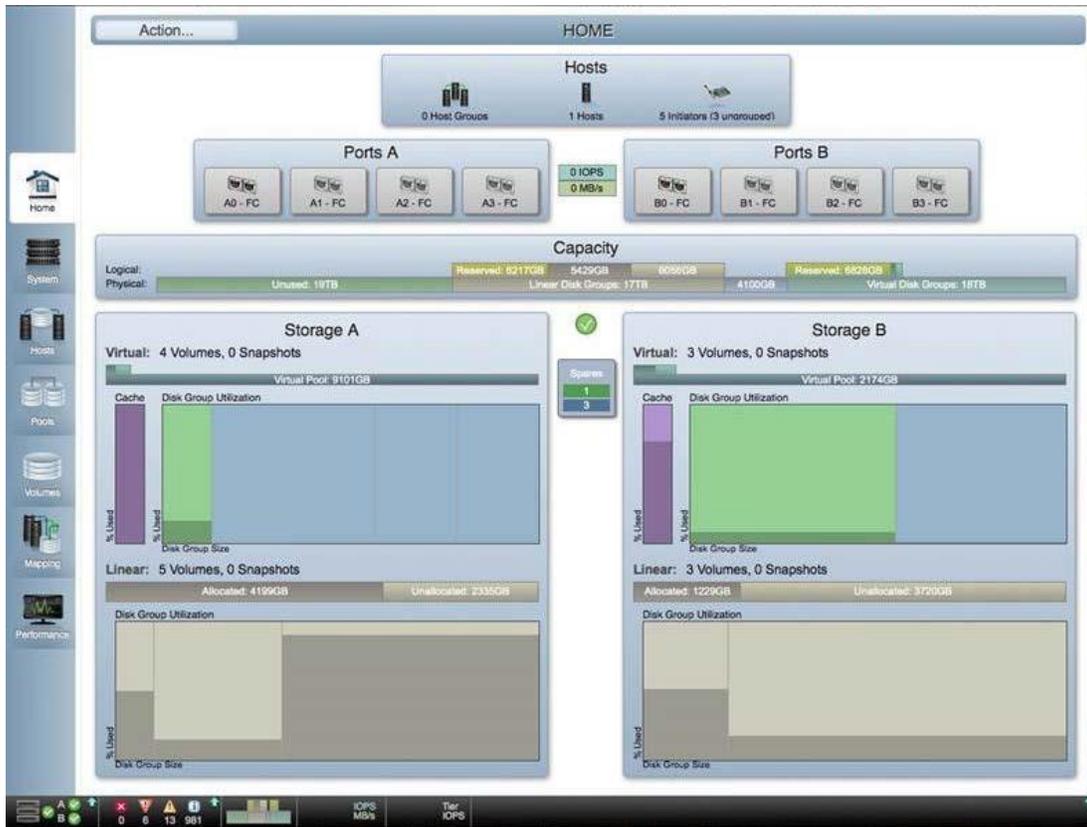


Figure 3- Home screen with Pools Provisioned

Volumes in Virtual Disk Pools

To further explain the virtual disk pool concept, we will first look at how volumes are treated in the virtual disk pool. One of the key concepts of the Lenovo SAN Manager is the addition of a virtualization layer that allows a volume's data to be segmented into discrete 4MB entities called pages. These 4MB pages are managed individually, and can allow a volume's data to be spread over potentially

multiple underlying storage pool Virtual Disk Groups and potentially multiple tiers (SSD, Enterprise SAS, MDL SAS) of disks. See figure 3.

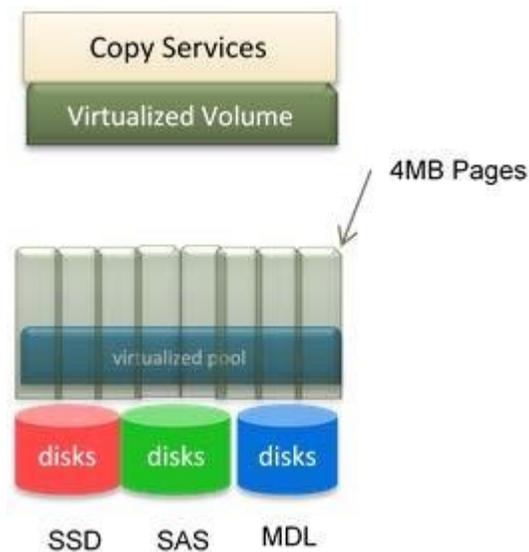


Figure 4- Virtual Volume

Mapping in the LSMC Interface

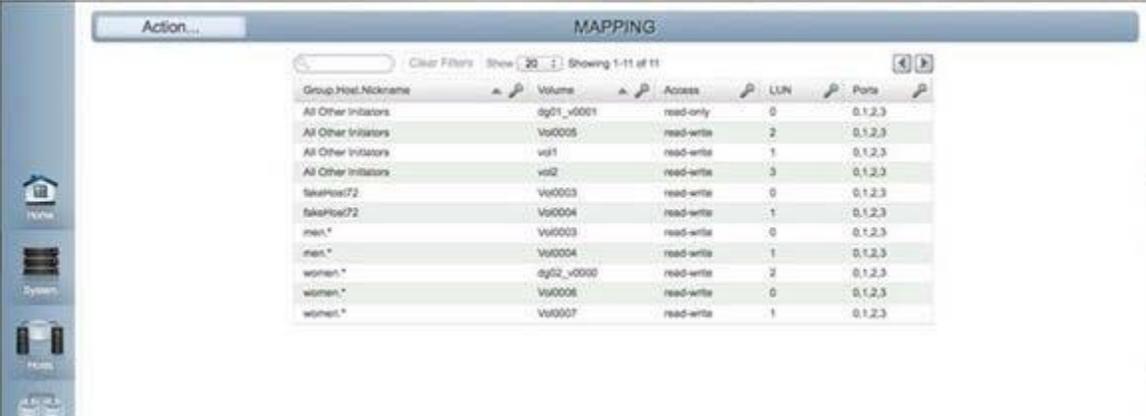
Once the users have added their Disk Groups to create the Pools, they may now create and map volumes, are now assigned to a pool instead of a VDisk.

Lenovo SAN Manager includes the ability to assign volumes to groups. This grouping capability enables large numbers of initiators to be mapped to LUNs in a single operation – improving the efficiency and organization of host configuration. In addition, the LSMC SMU incorporates search filters that greatly simplify the task of managing large numbers of volumes and reduce management time.

To map a volume, the user may select the Mapping topic, or click on the volume and select Mapping under the action tab.

Users may now create initiator names, assign to Hosts, and then assign Host to Host Groups. This greatly simplifies the tasks of managing and mapping large numbers of Hosts that may have the same mapping requirements. Filter capabilities also exist for the Host and Host group tables.

Lenovo SAN Manager allows for users to do default mapping by selecting “All other initiators.” Selecting this will make the volume available to all host ports. The user may also do explicit mapping - mapping to individual initiators, hosts, or host groups. The LSMC will map to both the A and B controller by default for each port. Figure 5 is an example of the Mapping Screen.



Group	Host	Nickname	Volume	Access	LUN	Ports
All Other Initiators			dg01_v0001	read-only	0	0,1,2,3
All Other Initiators			Vu0005	read-write	2	0,1,2,3
All Other Initiators			vd1	read-write	1	0,1,2,3
All Other Initiators			vd2	read-write	3	0,1,2,3
fakeHost72			Vu0003	read-write	0	0,1,2,3
fakeHost72			Vu0004	read-write	1	0,1,2,3
men.*			Vu0003	read-write	0	0,1,2,3
men.*			Vu0004	read-write	1	0,1,2,3
women.*			dg02_v0000	read-write	2	0,1,2,3
women.*			Vu0006	read-write	0	0,1,2,3
women.*			Vu0007	read-write	1	0,1,2,3

Figure 5- Mapping Screen in Lenovo Storage Management Console

Provisioning and Mapping with the CLI Interface

First, specific to setting a management interface, Set protocols and set cliparameters will include support for setting the management-mode interface at

both a global (set protocols) or session level (set cli-parameters). This setting will dictate which CLI commands are used.

Lenovo SAN Manager will provide a set of CLI commands to configure disk groups: add disk-group, remove disk-groups, show disk-groups, etc. Disk groups are a group of disks that together form a RAID set.

With volumes now residing in pools, a new set of CLI commands is available to manage them; show pool, remove pool, etc.

For additional information regarding CLI command changes, please refer to the CLI Reference Guide for a more detailed description.

Summary

Whether it's leveraging a small set of SSDs for tiering or read cache, to simplified management of large numbers of hosts – the Lenovo SAN Manager will provide users powerful new capabilities.

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