



How to Determine What Size LUN to Provision for your Melio™ Shared Storage

Technote



About this Technote

This technote provides guidelines for provisioning LUNs that will be formatted with Melio FS.

If, after reading this technote, you have any questions, please contact Sanbolic Technical Support at 617-402-2029 or email us at support@sanbolic.com.

Preallocation in Melio FS

By default, Melio FS *preallocates* or reserves space on SAN storage volumes to provide a safety net during times when large amounts of data residing in cache need to be flushed to disk.

For example, suppose there is a fairly significant amount of data stored in cache and a lazy write request comes along that forces all the data in cache to be written to disk. If there is not enough space available on the disk to fulfill the write request, data could be purged or Windows could simply blue screen, causing any data remaining in cache to be lost or possibly corrupted.

Melio FS addresses this type of scenario by ensuring there is enough space on a volume to allow events such as lazy writes to take place without introducing the potential for problems to occur; thereby preventing data loss or corruption. The preallocation of space to avoid such issues is based on approximately 1.2 times the amount of RAM in each server participating in a Melio cluster.


For example, if there are three servers participating in a Melio cluster and each server has 4GB of RAM, approximately 14.4GB (3 x 4 x 1.2) of space would be preallocated on the Melio volume. The preallocation of space begins with the initial writing of data to the Melio volume and can be seen under the volume's properties when you open **My Computer**.

The effect of preallocating or reserving space on the disk is that the full capacity of the disk would not be available for writing under normal circumstances; thus it is often suggested that a LUN be provisioned using the following calculation:

The amount of space you plan to use + 10% to 20% additional space for future needs + 1.2 x the total amount of RAM installed in all servers participating in a Melio cluster.

Using the example presented above in which three servers (each with 4GB of RAM) are accessing a Melio volume, if an administrator wanted to ensure they had a volume that was large enough to accommodate 100GB of data, it is recommended that a 135GB LUN be provisioned and presented to each of the servers in the Melio cluster: $100\text{GB} + 20\text{GB} (.2 \times 100\text{GB}) + 15\text{GB} (3 \times 4 \times 1.2) = 135\text{GB}$.

By creating LUNs based on this calculation, there should be more than enough disk space to meet both current and future needs while maintaining the safety net to avoid potential data loss and/or corruption.



Note: Every time a new server joins a Melio cluster, additional space (1.2 x the RAM installed in that server) is reserved by the file system.

Benefits of Preallocation

- Increases the overall performance of the file system as each server does not have to negotiate for free space with all the other servers in the cluster.
- Ensures there is enough disk space available in the event that large amounts of data stored in a server's cache must be flushed to disk.
- Prevents fragmentation within the file system.

Disabling Preallocation

Although it is not recommended, the preallocation feature can be disabled by checking the "Preallocation Disabled" option in the **Fine Tune** section of the Melio Configuration utility (*Start > All Programs > Melio Configuration*). When the preallocation feature is disabled, the total amount of free or available space on a volume does not appear under the volume's properties until all the servers participating in a Melio cluster are rebooted.

Important: It is quite likely that disabling preallocation will adversely affect I/O performance. Preallocation is designed to address potential issues caused by storing large amounts of data in cache, which is used to support applications that require buffering. Since the majority of today's applications use buffering to improve performance, disabling preallocation will, under most circumstances, result in reduced performance. At the same time, applications that do not require buffering, but instead instruct the operating system to write data directly to disk (bypassing Windows Cache Manager), should not see any adverse effects in performance.

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