



AssuredSnap™ performance impact in a Microsoft Exchange environment

Overall system performance will be slightly impacted by snapshots – given today’s business sensitivity to data loss and down time the choice is easy

Snapshot Overview

As the name implies, a snapshot is an image of the data captured at a specific point in time. This simple operation is a very powerful tool as the snapshot data can be used to improve backup operations, provide instant file recovery, or provide real-time fail-over volumes for business continuance.

Performance Impact

The performance impact of implementing snapshots will vary based on the applications read/write ratio. For many applications, for example Microsoft Exchange, a typical ratio is 70% read, 30% write. Implementing snapshots primarily impacts write operations, and the write profile, random vs. sequential, greatly affects overall performance.

As a point of reference, comparing volumes with no snapshots to volumes with snapshots, in a 100% write environment, random writes have a measured performance difference of 33% and sequential writes have a measured performance difference of 22%. Keeping the environment consistent and measuring 100% read performance, random reads showed a 4% difference while sequential reads measured zero difference.

When the solution is viewed in its entirety, this results in a 7-13% performance impact when implementing snapshots on a database application like Microsoft Exchange. Given the protection snapshots provide, this performance impact is well worth the overhead.

	Mix	IOPS	Random Operation Performance Impact	Sequential Operation Performance Impact	Random IOP/Sec	Sequ IOP/Sec
Reads	70%	70	4%	0%	67.2	70
Writes	30%	30	33%	22%	20.1	23.4
Total	100%				87.3	93.4
System IOPS		100		Performance Impact >	13%	7%

Most database applications will first write any modifications to a log file, this operation is done sequentially. Then in a subsequent operation the log file information is transferred to the database, a highly random operation.

What Causes the Performance Impact?

Every snapshot solution will have some performance impact. The Dot Hill's AssuredSnap was designed with both performance and space saving snapshots in mind. When new data is written to a volume that has been snapped, the data must first be preserved in the snapshot, so an additional write operation takes place to write the original data to the snapshot – an operation known as 'Copy-On-Write'. This operation impacts write performance as shown in the table above but has little to no impact on read operations.

Data Recovery Impact

For some organizations a 7% performance impact may seem high but when backup and recovery operations are taken into consideration the additional protection provided by snapshots is immense.

Let's compare snapshots to a tape solution. Uncompressed LTO 3 recovery speeds are approaching 250GB/hr, for a 1TB system it would take 4+ hours to perform a recovery operation. An organization using snapshots could perform the same operation in less than 15 minutes.

Obtaining a Snapshot License

To get or extend your snapshot licenses contact your Reseller sales representative or email Dot Hill at support@dothill.com. You will be issued a license key which extends snapshot counts up to 64 or 256 depending on the storage array.

Licensed Features Installed	
Snapshot	Enabled
Snapshots Available	64 (16 on default system)
Snapshots In Use	2
Volume Copy	Enabled
VSS	Disabled
VDS	Disabled
License File Signature	90abee5c551f37c24efbf7ad78

16 snapshots are included in the 2000 series product. You can increase up to 64.

More Snapshot Information

For more information about protecting your Microsoft Exchange environment with Dot Hill storage reference the following web site, <http://www.dothill.com/ms>