



PROFESSIONAL SERVICES TECH NOTE #062

read_reallocate

The Concept

Data ONTAP 7 introduced the **reallocate** and **wafI scan reallocate** commands to restripe large files, LUNs and even volumes to improve read and write performance by consolidating data block and free space into contiguous stripes. At a macro level, these commands try to keep data blocks contiguous without regard to how the file or LUN is read by a client system. This is where the Data ONTAP 7.3 volume option, **read_realloc**, takes effect.

When a file read request is received, WAFL performs a predictive readahead to load additional data blocks into memory assuming they will soon be requested. The **read_realloc** option looks at the sequence of I/O commands required to read these blocks into memory. When it determines a sequence of blocks being read is fragmented it may request a rewrite of those blocks (it does not rewrite the entire file).

Examples

```
fas1> vol options myvol read_realloc [on | space_optimized | off ]
```

on = optimize read performance in active filesystem and existing Snapshots at expense of larger Snapshots
space_optimized = does not optimize existing Snapshots so read performance of data in Snapshots is not increased

What It Means To You

The **reallocate** and **wafI scan reallocate** commands work proactively by restriping all data and free blocks in a volume or large file or LUN. The **read_realloc** volume option works more reactively by only moving blocks after they have been requested by a client. For example, the install of an OS or application into a vm disk or LUN file may write files in alphabetical order. However, when the OS or application is loaded, the files are not read alphabetically so readahead prediction is inefficient. By analyzing how data is requested by clients, **read_realloc** optimizes the layout of blocks in the vm disk or LUN so that subsequent reads will be faster.

Volumes with large files like media files or vm disk files are typically read sequentially and may benefit from enabling this option. This feature is still maturing and will become more prominent in later versions of Data ONTAP 8. As with **reallocate**, ensure you maintain sufficient free space (generally >=10%) in a volume when using this option. Unfortunately, deduplication and **read_realloc** work against each other so decide whether space efficiency or read performance has higher priority before enabling either feature on a volume.

More Information

Data ONTAP 7.3.3 Commands Reference: vol command

http://now.netapp.com/NOW/knowledge/docs/ontap/rel733/html/ontap/cmdref/man1/na_vol.1.htm

Data ONTAP 8 System Admin Guide: About read reallocation

<http://now.netapp.com/NOW/knowledge/docs/ontap/rel80/html/ontap/sysadmin/GUID-733A19F3-8226-44EA-8CA5-C86BB814733F.html>