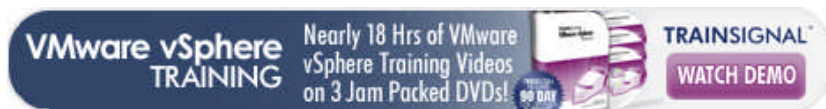




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Don't use VMware Raw Device Mapping (RDM) for performance, but ..

Jul.23, 2010 in [VMware VI3](#)

Till today everywhere I looked recommended using RDM over VMFS for performance (when a higher I/O is required), though today while studying for my VMware Design Exam I have got my hand on the “ [Performance Characterization of VMFS and RDM Using a SAN](#)” document by VMware. The interesting executive summary of the document is copied up to the letter below:

=====

Executive Summary:

The main conclusions that can be drawn from the tests described in this study are:

- For random reads and writes, VMFS and RDM yield a similar number of I/O operations per second.
- For sequential reads and writes, performance of VMFS is very close to that of RDM (except on sequential reads with an I/O block size of 4K). Both RDM and VMFS yield a very high throughput in excess of 300 megabytes per second depending on the I/O block size.
- For random reads and writes, VMFS requires 5 percent more CPU cycles per I/O operation compared to RDM.
- For sequential reads and writes, VMFS requires about 8 percent more CPU cycles per I/O operation compared to RDM.

=====

Reading the above executive summary, I was kinda shocked at first glance. Further looking at the graphs showing the tests numbers they were close enough that I felt the difference might not be noticeable between RDM & VMFS. I guess the conclusion I have drawn from that paper, which as well clearly mentioned in the summary of it is below:

You should limit the usage of RDM to the few special cases that require the use of raw disks. Backup applications that use such inherent SAN features as snapshots or clustering applications (for both data and quorum disks) require raw disks. RDM is recommended for these cases. We recommend use of RDM for these cases not for performance reasons but because these applications require lower-level disk control.

My final recommendation is to avoid using VMware Raw Device Mapping if you don't need it for any of the special cases

mentioned above as it does not give you much of performance improvement & would restrict you from using many VMware ESX capabilities including the below:

- No migrating VMs with physical mode RDMs if the migration involves copying the disk (Storage VMotion)
- No VMotion with physical mode RDMs
- No VMware snapshots with physical mode RDMs
- No VCB support with physical mode RDMs, because VCB requires VMware snapshots
- No cloning VMs that use physical mode RDMs
- No converting VMs that use physical mode RDMs into templates

I feel this post will start a nice argument & would like to hear other experts opinion about the subject in the comments area below. I appreciate any feedback about my finding.

[Comments \(1\)](#)

One Comment on “Don’t use VMware Raw Device Mapping (RDM) for performance, but ..”

1. *Jeff Snavelly*

[July 23rd, 2010 at 8:18 pm](#)

I know it probably didn't effect the outcome, but their choice of disk configuration strikes me as really odd. I am left wondering why you would choose that for your test configuration.

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About: I am currently working as a System X & Storage Technical Specialist at Gulf Business Machines. I have implemented few of the largest Virtualization Solutions around the region. I have started virtualizationTeam.com to share knowledge with the world & to spread Virtualization around the globe. I am hoping to get more people to dig in and share more of their knowledge through my blog as well. Thanks to all of those who did & hope more will. You can find more about me at: <http://www.linkedin.com/in/eiadalqqad>

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