StarWind Virtual SAN® How to check if VAAI functions properly

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TECHNICAL PAPER

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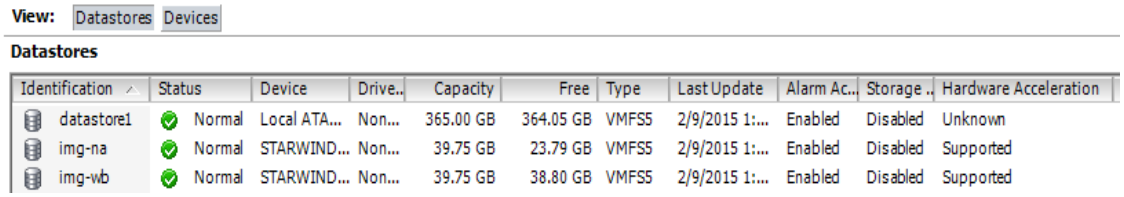
Introduction

This document is for experienced StarWind users and VMware administrators, who want to decrease the workload caused on the network by using VAAI. It reveals how exactly one can check if VAAI is working properly and how productive it is.

VAAI (vStorage API for Array Integration) is a complex of technologies, designed to offload certain VM disk operations to the storage array. In this case, when working with the disk subsystem, the virtualization host commands the array to perform specific actions, without having to process all the data it had to in the traditional case.

In this event, we have a few mounted disks on ESX host. The properties of disk system show that hardware acceleration has Unknown status. This means that the host hasn't yet had to perform any VAAI supported operations (basically – it's a default status). Once an operation supported by VAAI (i.e. Copy/Paste of a virtual disk) is performed, then VAAI will try to tune in.

If it succeeds, the Supported status will appear, if not — Not Supported (Unsupported).


View: Datastores Devices

Datastores

Identification	Status	Device	Drive..	Capacity	Free	Type	Last Update	Alarm Ac...	Storage ..	Hardware Acceleration
datastore1	Normal	Local ATA...	Non...	365.00 GB	364.05 GB	VMFS5	2/9/2015 1:...	Enabled	Disabled	Unknown
img-na	Normal	STARWIND...	Non...	39.75 GB	23.79 GB	VMFS5	2/9/2015 1:...	Enabled	Disabled	Supported
img-wb	Normal	STARWIND...	Non...	39.75 GB	38.80 GB	VMFS5	2/9/2015 1:...	Enabled	Disabled	Supported

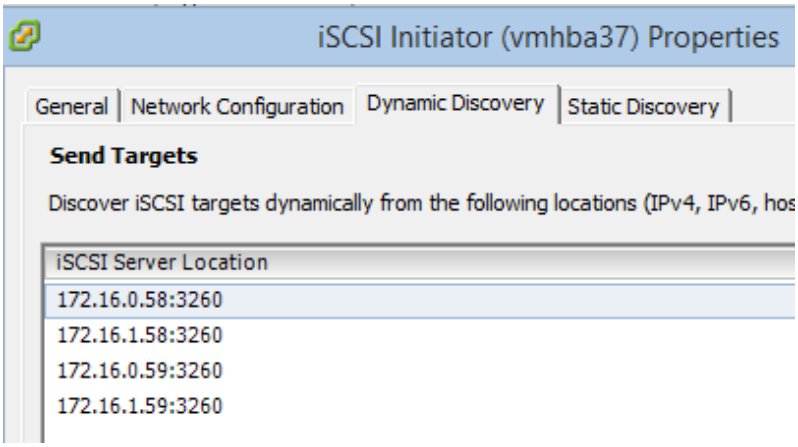
How to check if VAAI really works

1. Create an ImageFile device in StarWind.

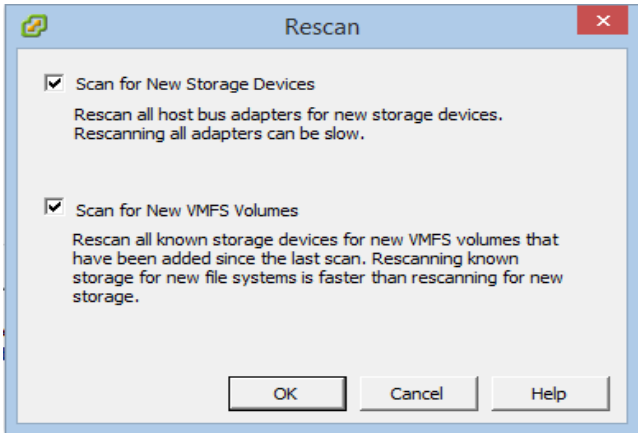
2. Connect the device to ESX-host.

Go to Configuration->Storage Adapters

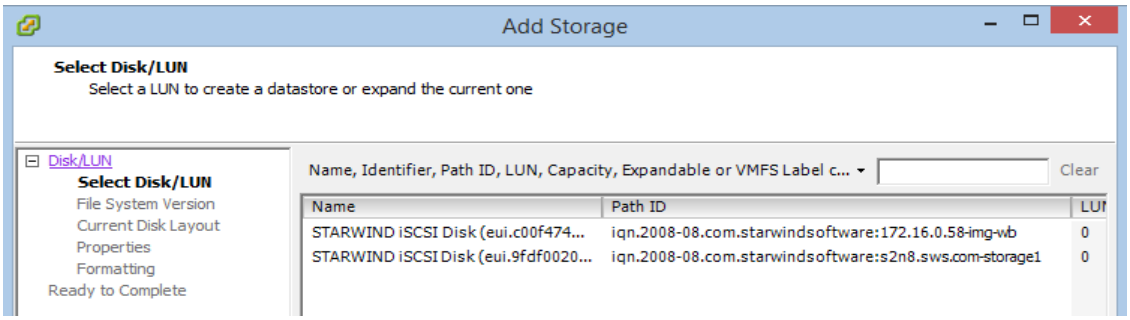
Set the server where the disks are created in the ISCSI Software Adapter properties, Dynamic Discovery tab. In this case – StarWind server.



Click Rescan All. All the available devices that can be connected to ESX-host will be shown.



Go to Configuration-> Storage. Click Add Storage to add the required disk storage.

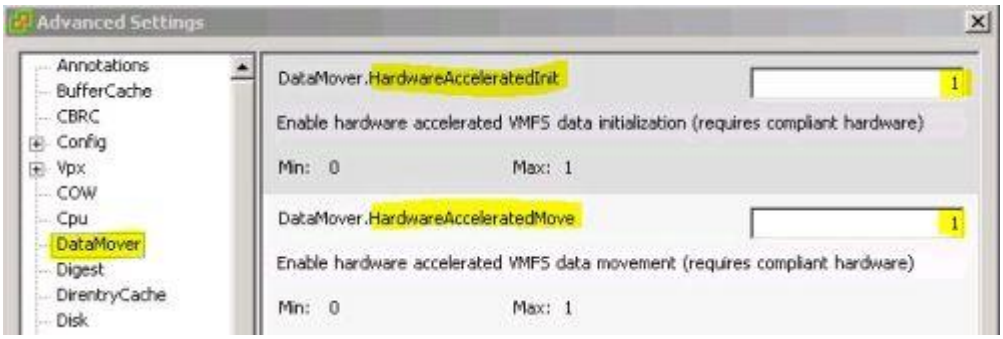


3. Turning on VAAI.

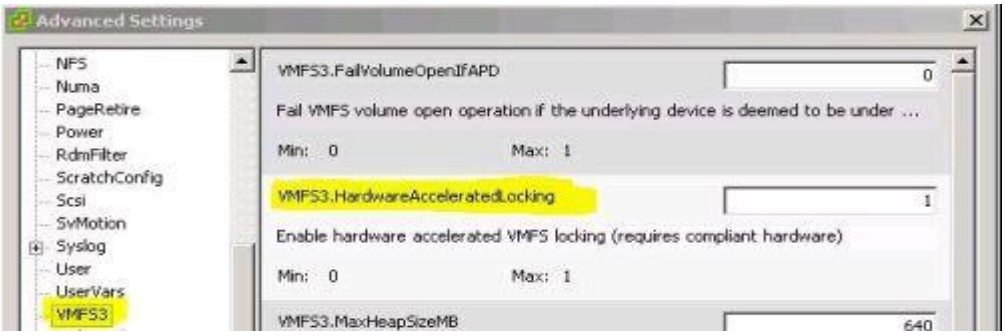
Method 1, through vSphere Client GUI-interface

Select ESX-host, Configuration, then in Software, select Advanced Settings.

Also, put HardwareAcceleratedMove and HardwareAcceleratedInit parameters to 1 (1 – on, 0 – off) in DataMover.



Go to "VMFS3" , set "VMFS3.HardwareAcceleratedLocking" to 1 (0 – turned off).



We confirmed that VAAI is running

Second method.

It's possible to connect to esx-host via ssh (using putty, for example).

The following commands show the STATUS of parameters, and they're convenient for checking if everything is set right :

esxcfg-advcfg -g /DataMover/HardwareAcceleratedMove

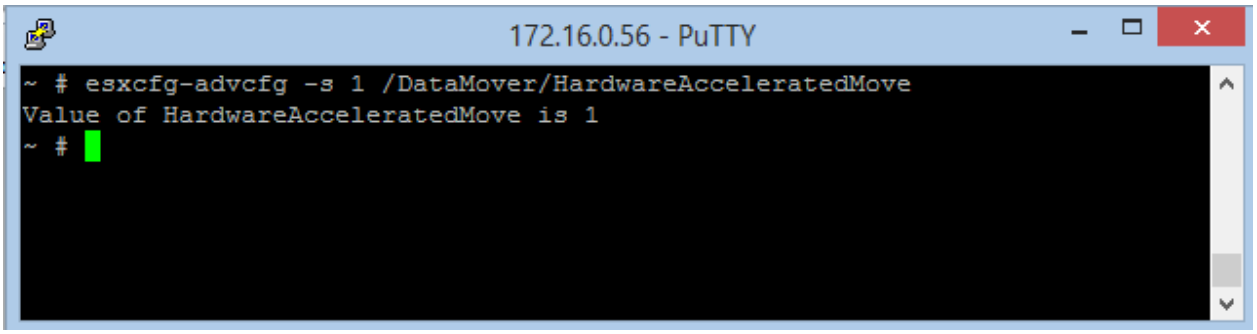
esxcfg-advcfg -g /DataMover/HardwareAcceleratedInit

esxcfg-advcfg -g /VMFS3/HardwareAcceleratedLocking

The result should look like this:

```
~ # esxcfg-advcfg -g /DataMover/HardwareAcceleratedMove
Value of HardwareAcceleratedMove is 1
~ # esxcfg-advcfg -g /DataMover/HardwareAcceleratedInit
Value of HardwareAcceleratedInit is 1
~ # esxcfg-advcfg -g /VMFS3/HardwareAcceleratedLocking
Value of HardwareAcceleratedLocking is 1
```

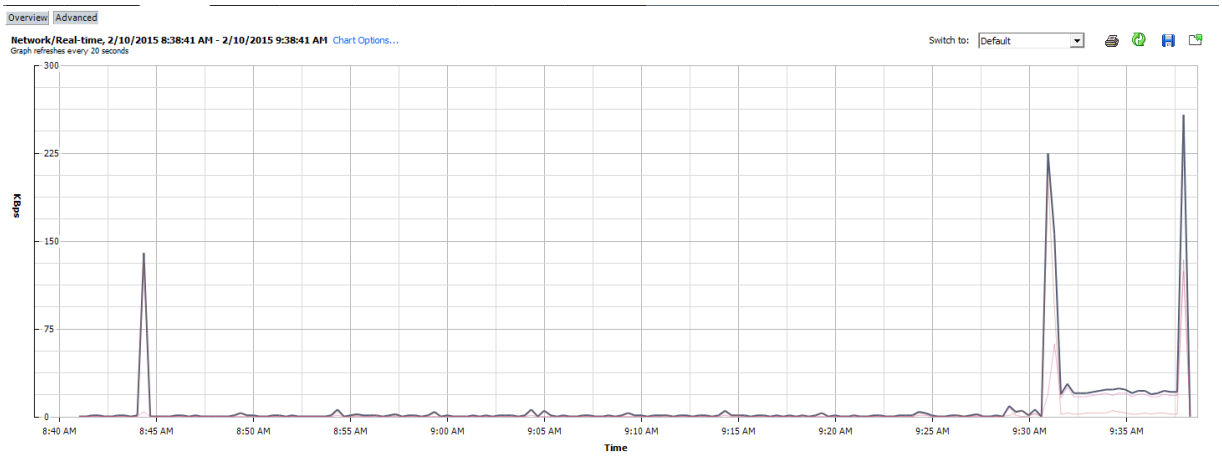
The same commands with the key –s CHANGE the parameters, for example:
esxcfg-advcfg –s 1 /DataMover/HardwareAcceleratedMove



4. With VAAI turned on. Performing VM migration between mounted datastores.

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time
Relocate virtual machine	MV1	Completed		SWS\maksym.kravtsov	vcenter.sws.com	2/10/2015 9:31:03 AM	2/10/2015 9:31:03 AM	2/10/2015 9:38:00 AM

It took about 7 minutes.
Performance in the NIC will look like this (9:31 – 9:38):

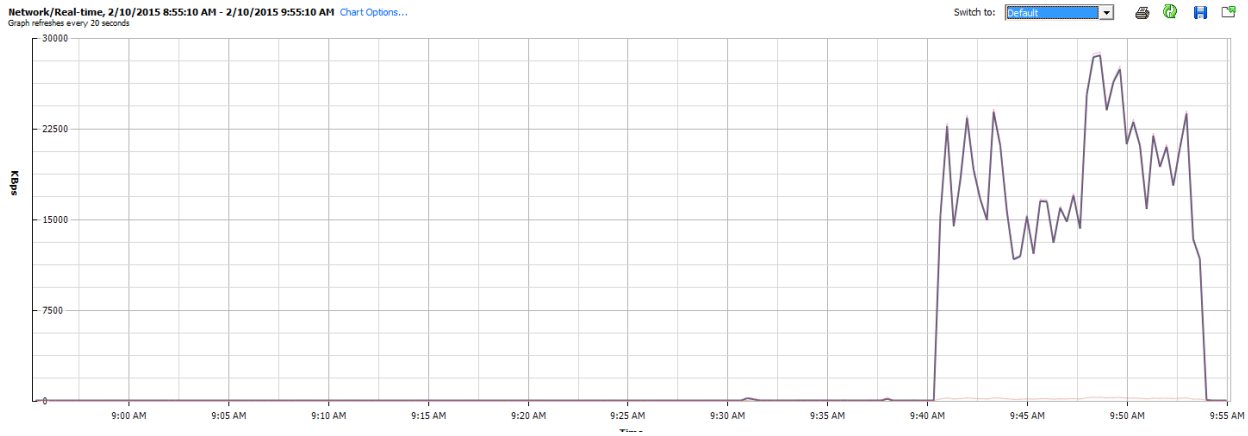


Maximums of 227 KBps. The network is almost idle and suitable.

5. Turning off VAAI. Migrating the VM.

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time
Relocate virtual machine	MV1	Completed		SWS\maksym.kravtsov	vcenter.sws.com	2/10/2015 9:40:31 AM	2/10/2015 9:40:31 AM	2/10/2015 9:53:49 AM

13 minutes. Performance…(9:40-9:53)



The NIC workload shows 20MBps during the whole process.
In case everything's done right, VAAI work is clearly seen.

6. You can also experiment with cloning or copying VMs between datastores.

Summary

VAAI support allows StarWind to offload multiple routine storage operations from the VMware hosts to the storage array itself. Thus, these operations are carried out much faster and with no impact on the hypervisor operation.

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