VMware vSphere 5.1 Feature Spotlight: Storage

Storage is an important, if not one of the most important sector of a successful virtualization and/or cloud environment. We often take storage for granted as we see the prices dropping significantly compared to previous decades. What makes great storage even better is great tools to utilize, manage and truly amplify the awesomeness that existing and upcoming storage platforms have to offer.

Throughout the vSphere versions we have seen interesting leaps in how the hypervisor is able to leverage the storage layer. What makes vSphere 5.1 even more awesome is the introduction of a number of really cool features such as:

- Space reclaim
- Increase VMFS host access limits from 8 to 32
- APD (All Path Down) condition handling
- 16 Gb FC support
- VAAI improvements
- Datastore correlation
- Parallel Storage vMotion

These are just a few of the new features and enhancements but they certainly stand out as breakout features for the vSphere 5.1 environment which will add more versatility to your vSphere 5.1 and vCloud Director solutions.

Space Reclaim

vSphere has given us the ability to dynamically grow our storage since version 4.x and with 5.0 we were introduced to VMFS-5 which added the unified block size for volumes which allowed a much more efficient layout for VMFS volumes.

With vSphere 5.1 VMware has added the space reclaim features which will now let us use the Space-Efficient Sparse Disks (SE Sparse Disks) feature to mark unused blocks in the guest file-systems and allow vSphere to wrestle back that space to re-thin the volume allocated to the guest OS.

For file servers and database servers with highly randomized I/O and lots of fragmentation, this will be a great way to leverage Thin Provisioning and let you get the most out of your storage platform.

Increase VMFS host access limits from 8 to 32

While this may not have affected your systems just yet, it is something that frees up future limits if you are looking towards VDI and vCloud deployments. Currently, with a VMFS file-system you are capped at 8 hosts sharing a read-only file. When you begin ramping up your VDI environment and put vCloud together to fully utilize its scale out capability, this could be a problem.

Now with the vSphere 5.1 implementation of VMFS-5 (note that it is only available with 5.1 hosts access VMFS-5) you open the door for a better multi-host implementation to spread the load and add

more resiliency and redundancy for your organization.

APD (All Path Down) condition handling

Have you had a situation where you lost all paths to your storage? Not a problem anymore…well, less of a problem. The issue with APD situations is that vSphere 4 and earlier could often run into I/O path query threads that took priority over other host threads. If that

We've got a piper down…I mean path down!!

happens, a Permanent Device Loss (PDL) condition should trigger the restarting of guest resources on hosts with available paths, but because of queuing of thread requests it could result in guest outages or even worse, host disconnections from vCenter.

Enter vSphere 5.0 with better handling of APD and PDL situations, and now with the 5.1 VMware has added better handling of APD and PDL by letting the hosts communicate more deeply to the storage environments to query for path status and look for PDL conditions more effectively. It has also added those functions to single LUN targets which allows iSCSI target loss to be re-queried and confirmed as PDL before marking it as unavailable.

16 Gb FC support

While your environment may have contained and supported the hosting of 16 Gb FC HBAs with vSphere 5.0, they were actually running in 8Gb mode for all intents and purposes. Now your entire storage chain can operate at the full 16 Gb to enjoy the full bandwidth that your hardware can give.

VAAI improvements

For those who have been able to leverage VAAI support for their storage it has been a great feature. With vSphere 5.0 there were great enhancements for VMware View. Now with vSphere 5.1 you will extend those enhancements into your vCloud Director environment to make more gains with I/O efficiency for vApps and Linked Clones.

Datastore Correlation

Datastore clusters were cool. Storage DRS in vSphere 5.0, even cooler. Being able to set storage affinity to force guests to different datastores was (and still is) a massive feature to have for best performance.

Now VMware has extended the datastore toolkit to include Datastore Correlation. This is a feature where the I/O injector not issues load to datastores and measures if other datastores experience latency. So now the storage layer is not just volume aware, but extends its awareness to detect if multiple volumes are sharing back-end spindles on the physical array. Now that is pretty awesome.

Parallel Storage vMotion

Up to now, Storage vMotion has been a serial function. If you have had to migrate a number of machines at the same time, this was painfully obvious. Now with vSphere 5.1 Storage vMotion you will have up to 4 parallel migrations happening simultaneously, and just as importantly, it will perform parallel migrations only on distinct datastores which means that it won't overload a single area of storage.

Much, much more

There are a number of really cool features and enhancements, and if you are running in VMFS-3 at the moment you will really love when you migrate to VMFS-5 and vSphere 5.1 in the future.

There are lots of really great resources on storage in VMware, and with VASA and VAAI integrated storage it just gets more and more awesome with every step. Keep your eyes on the VMware site and monitor the Twitterverse for the storage gurus. Even more importantly, keep watching your storage vendor for some exciting features that they will be offering to better integrate with vSphere going forward.

Here is the VMware vSphere 5.1 Storage Whitepaper that was introduced at VMworld 2012: http://www.vmware.com/files/pdf/techpaper/Whats-New-VMware-vSphere-51-Storage-Technical-Whitepaper.pdf

If you are like me, you are counting down the days to release date. Purchase of vSphere 5.1 is available on September 10th with download access beginning on the 11th. Can't wait!!

VMware vSphere 5.1 Feature Spotlight: vSphere Replication

In this Feature Spotlight we are going to look at the VMware vSphere Replication capability. While vSphere has already dipped their toes into the replication waters, the change with vSphere 5.1 is that the feature is bundled with the core and available to all editions.

Replication is the backbone of so many functions in IT today that adding it to the vSphere arsenal of tools is like putting another cannon in already well armed tank; or as many in the community call it: +1.

There are many products out there today which do replication; this is a reality. In fact, you have such a selection that it is often hard to isolate which is the "best" for your situation. For this reason, you should remember that there many not be a single solution across the board, but a hybrid selection of tools can open up to much better possibilities. Making vSphere Replication a part of the core from Essentials Plus upwards just expanded your suite of options out of the box.

The vSphere Replication comes out of the gate with great features:

- VSS integrated replication – This means that your Microsoft SQL Server and Microsoft Exchange Servers are replicated with application awareness which can ensure a consistent copy is available
- Hypervisor level replication – The I/O layer lies at the hypervisor so that the overhead is not left to the OS. There is a vSphere Replication Appliance (vRA) which handles the I/O management and transfers the data to the target virtual machine
- Block level replication – Another key part of a successful replication product is granular data transmission. Block level transmission allows minimal data transfer size while maintaining integrity

Isn't This Just Site Recovery Manager?

That is a great question, which has been answered by VMware quite well. The vSphere Replication feature is meant for specific VM recovery which gives you a more granular and targeted recovery strategy for your VM environment.

VMware SRM was originally presented to be just what its name says: Site Recovery. The design was for a total host or cluster recovery from one site to another. The interesting component that wasn't baked into early editions of SRM was native replication. There was still a reliance on a SAN based or volume based replication product getting your data from one location to another and SRM was the vehicle to get the VM presence to the recovery site. SRM 5 added vSphere Replication in Q4 of 2011 which was a massive gain for the product and a strong lean towards the cloud services direction.

SRM also came with a price tag. That was another strong notch in the cons column for smaller organizations. What VMware has done for us here is that they've now added the replication tool into the architecture for you which you can then use to seed your content for SRM. How cool is that? Ultimately, vSphere Replication is not SRM, and SRM is not vSphere Replication. Each has its own specific use cases which may cross paths but are not requirements for each other.

Replication. Check. Management. Check

Getting your data into the target VM is one thing. Managing the recovery and seeing the status during protection and recovery is another. The management component of the vSphere Replication is neatly baked into the new vSphere 5.1 Web Client.

The recovery process is "a few clicks". Of course, there is much more to it underneath the covers, and there are a lot of factors that are involved in the fail-over process. The great thing about this being a native product feature is that you have the information available to you in the vSphere Web Client where you will be doing all of your other day-to-day administration.

So What's Missing?

To quote the Viper played by Tom Skerritt in Top Gun: "I'm not here to blow sunshine up your…" well, you know where that one goes. The real key to understanding a new feature is also understanding where it may have shortcomings based on your requirements.

I’m a big fan of this new feature, but I also have to recognize some key points:

- Physical machines are not protected – Hey, I’m as virtualized as the best of them but the reality is that many of us still have, and will continue to have physical servers to support and protect in our environments. You will still need to augment your vSphere Replication with an additional product that can extend protection to your physical servers.
- This is not a test – There is no -WhatIf option here. In order to recover a virtual machine, the source machine needs to be completely unavailable. This is a unfortunate as it limits some of the use cases for BCP testing and for certain instances where you need to have the recovery machine online for a purpose but not initiate a true fail-over.
- Proof is in the pudding – This is an awesome feature, but the true test of any product is the real-life usage and testing the limits of both the product as a feature and for the application as well. While the VMware component is great, we may have some challenges specific to the application/server source that could add limits.

Every product will have its amazing features and some potential loopholes in its application within your environment. The focus of BCP and protection in general is as much a business process and a business application function as it is a vendor suite feature. As always, the onus is on us as Systems Architects and Application Architects to design with the infrastructure in mind.

VMware provided a great Introduction to VMware vSphere Replication paper here: http://www.vmware.com/files/pdf/techpaper/Introduction-to-vSphere-Replication.pdf

Read up and take a look at your environment to see where vSphere 5.1 and vSphere Replication may come in handy. This little line item in the overall feature list could turn out to be a massive win for VMware and most importantly for their customers.

I’ll be sure to put this feature through some tough tests and share my results.