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What's New in vSphere 5.5

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Introduction

When I was writing my latest book The Official VCP5 Study Guide, I spoke with many VMware experts who can generally predict the future of certifications with some accuracy. I was assured that the details of the blueprint that make up the VCP-510 test would not change until the next major revision of the software (e.g. vSphere 6.0?). At that time, vSphere 5.0 was the "flavor of the day," and vSphere 5.1 was yet to be released. True to form, when VMware released vSphere 5.1, they did not change the blueprint; at least not in any appreciable way. They did change the name of the certification thrice! First it was changed to VCP-DV and then, with little warning, it was changed again to VCP-DCV; and finally (at least for now), it was changed to VCP5-DCV.

It doesn't really matter why the name of the certification changed, or that it did, for that matter. What does matter is that the specifics of the blueprint, and, therefore, the material that you need to know for the test, did not change. For example, there was no mention of Single Sign-On or Enhanced vMotion (now to be called XvMotion) on the blueprint, even after the release of vSphere 5.1. That being the case, there was no reason to write a supplemental technical paper such as this one.

Well, since the release of vSphere 5.5, they have not yet announced a change to the blueprint for the test. That being the case, I will say, for now, that the VCP-510 test should remain unchanged as well. My goal here is not my usual, to reeducate you on everything that you need to know for the test; instead my aim is to point out the few (or at least limited) changes of which you should be aware as they might apply in your company or organization. (When the blueprint finally changes, I will write another paper to address the changes more directly as they relate to the test.) Therefore, in my opinion, the most significant changes from vSphere 5.1 to vSphere 5.5 are as follows:

- **Single Sign-On Re-Written -** You need to understand Single Sign-On; you need to know its requirements and know how to configure all of its components;. That hasn't changed. What has changed is the way that VMware is implementing Single Sign-On, which may work much better for you.
- **vSphere Distributed Switches Are Improved -** There are new features on version 5.5 vSphere Distributed Switches (vDSs) that enhance their functionality and security. You should understand the latest changes and how they might affect your design and your management.
- **VSAN -** This is a new storage feature that allows you to use previously wasted storage space and create reliable and redundant storage options for your VMs. It may just revolutionize the way we look at VM storage!

Of course, there are many other tweaks, such as a much more responsive Web Client, and higher configuration maximums (links below), but these are the three "game changers," in my opinion, between vSphere 5.1 and 5.5. I will start at the top of the list, with Single Sign-On.

http://www.vmware.com/pdf/vsphere5/r55/vsphere-55-configuration-maximums.pdf

http://wahlnetwork.com/2013/09/11/examining-user-experience-new-vsphere-5-5-web-client-video/

Single Sign-On Re-Written

I can still remember when there was no reconciliation of permissions between the ESX/ESXi 3.5 host accounts and Active Directory accounts; and that was stated as an advantage because it confined the permissions to only VMware administrators and could not "accidentally" give Domain Admins, who did not generally manage VMware, the ability to manage the host due to the Domain Admins global group being added to the local Administrators group on the ESXi host. In fact, in 3.5 the host never actually was a computer account in the Active Directory, and all of this was considered good.

Well, through a series of changes and enhancements, we have lived through vSphere 4.0, 4.1, and 5.0. We have arrived at a point where we not only want to authenticate the ESXi hosts through the Active Directory, but we also want to be able to authenticate the administrators of the systems in whatever way we can; and this is all considered good. My how times have changed!

It is not my intent to teach you everything that you need to know to configure and manage Single-Sign On. That is better served by just giving you the latest links for it, which I have listed at the end of this paper. My intent is for you to have a general understanding of Single Sign-On and understand what it will change and what you are looking for in regard to your study of Single Sign-On. In other words, you are better served if I give you the 30,000-foot view and the latest links to get the details.

Generally speaking, Single Sign-On allows an administrator to enter credentials only once and be authenticated against multiple repositories called Identity Sources. After one contiguous set of authentication checks, a token is created for the administrator that can be presented to multiple tools that the administrator needs to use. For example, if an administrator wears multiple hats, he might need to use vCenter, vCenter Operations Manager, Site Recovery Manager (SRM), and vCloud Director, just to name a few. With one logon, the administrator can obtain a secure access token that authenticates and admits him or her to each of these with whatever authorization he or she is allowed by that particular component. The authorization is up to the individual tool, but the authentication need only be performed once for all tools. Because of this, administrators in today's virtual datacenters can work on multiple tools more easily and with greater security than in the past, and that is good!

Unfortunately, when Single Sign-On was introduced with vSphere 5.1, many organizations found it difficult to implement because of errors caused in part by the RSA database that was built into it. To improve upon its product, VMware has re-written Single Sign-On and taken out the "bothersome" components such as the RSA database. The following are excellent links regarding the new Single Sign-On. Of course, just like any other new product, they are still working out all of the kinks.

http://blogs.vmware.com/vsphere/2013/09/allow-me-to-introduce-you-to-vcenter-single-sign-on-5-5.html

http://www.virten.net/2013/09/howto-ad-authentication-in-vcenter-sso-5-5/

vSphere 5.5 Distributed Switch Improvements

Don't get me wrong, vSphere Distributed Switches (vDSs) are not new (though they used to be called vNetwork Distributed Switches), but there are some new features associated with vDSs in vSphere 5.5. In real life, it's only large enterprises that will usually make use of vDSs, since they require an Enterprise Plus vSphere Edition license; but that still doesn't mean that you should just ignore them. Understanding the improvements may give you a better vision of where this is all headed and which features may soon be available for everyone. Here is a list of some of these improvements and a brief definition. In addition, I will give you the latest links to get all of the details.

- **LACP -** Link Aggregation Control Protocol (LACP) uses the IEEE 802.3ad standard to form a single Ethernet link from two or more physical links. Using LACP, you can improve the throughput and fault tolerance of your vDS links. The equivalent configuration is also required on the physical switches to which your hosts are connected.
- **IP Source Guard** - IP Source Guard is a security feature that restricts traffic on untrusted Layer 2 ports. It can be used on vDSs to help prevent IP spoofing attacks.
- **Dynamic ARP Inspection -** Dynamic ARP Inspection (DAI) is a security feature that validates ARP packets in a network. It can be used to help prevent some man-in-the-middle attacks that originate with ARP spoofing or ARP cache poisoning.
- **ARP Rate Limiting -** ARP Rate Limiting sets a maximum on the ARP requests per second. It can be used to prevent a denial of service attack from succeeding. It can even disable a port, if necessary, to protect the system.
- **Autoscale –** Instead of choosing a number of static ports for a port group and being stuck with that number, Autoscale dynamically adds ports to a switch as you need them.

http://wahlnetwork.com/2013/08/26/vsphere-5-5-improvements-part-9-networking-and-vds-razzle-dazzle/

VSAN Introduced

What happens to all of that local storage that is leftover after your ESXi installations? What about the powerfully fast storage on the SSDs that are connected to the ESXi hosts? What if you could, in essence, "mop all of that up" and create redundant data space on which you could build a datastore and store your VMs in a shared environment between multiple hosts? This is, in essence, what VSAN does for you and your datacenter.

As I said, that is "in essence" what VSAN does. What VSAN actually does is much more interesting and even amazing. Before I get too far with this, I should mention that it's not ready for general release as of yet. VSAN was debuted at vmWorld 2013 in August and has been in Beta release since then.

So what's so amazing about it? The radically different part is that the storage is set aside and managed using the VMs themselves and, therefore, the VSAN can be configured to have as many copies of each VM on alternate disks so it is as redundant as you want it to be. This means that you can have two different VMs on the same datastore that have very different policies in regard to data protection. This is simply not possible on a traditional SAN or a NAS. In fact, this is a fundamentally different way of managing storage for a virtual environment. In addition, the SSDs that are generally included on hosts these days, and are required for VSAN, are not

used for storage capacity but are instead used to speed up performance by handling functions such as a write buffering and a read caching.

To be a little more specific, and then of course I'll give you a link or two, a VSAN requires a minimum of three hosts, each with an SSD and a "spinning disk". The maximums will likely change before the public release, but they are currently eight hosts with each host having five disk groups (one SSD and one spinning disk). If you have this configuration in your hosts, then all you have to do is put the host in a cluster, assign the dedicated network resources to connect them, and enable the VSAN in the cluster settings. You do not need RAID on the host; in fact, all RAID should be disabled on the host so that VSAN has access to each of the drives in an independent fashion. VSAN will take care of the rest.

http://www.vmware.com/products/virtual-san/

http://www.infoworld.com/d/data-explosion/vmware-vsan-inside-the-revolutionary-new-approach-storage-225962

Summary

So vSphere 5.5 is now available with myriad small improvements such as a faster Web Client, LACP, Autoscale, and higher configuration maximums. In addition, there are changes coming such as VSAN which may be ground breaking in regard to VM storage of the future. Still, the blueprint to obtain the VCP5-DCV certification does not currently reflect any of these changes. That only leads me to believe that something will have to change very soon with regard to a drastically changed blueprint, a new test, or even a new certification. When that happens, I'll be in touch!

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Bill Ferguson, VCI3, 4, 5, MCT, MCSE, MCP+I, CCSI, CCNA, A+, Network+, Server+, Security+ has been in the computer industry for over 20 years. Bill runs his own company as an independent contractor in Birmingham, Alabama, teaching classes for many national training companies, including Global Knowledge. Additionally, Bill has written and produced many technical training videos including: A+, Network+, Windows 2000 Management, Windows XP Management, Windows 2000 Security, Server+, and Interconnecting Cisco Network Devices. He also wrote the *70-298 Exam Cram 2 (Designing Security for a Windows Server 2003 Network)* for Que Publishing. In addition, he wrote the *Microsoft Certified Desktop Support Technician (MCDST) Study Guide* for Sybex Inc. and several Network+ titles. Most recently, he wrote *The Official VCP5 Certification Guide* (Pearson/VMware Press). Bill says, *"My job is to understand the material so well that I can make it easier for my students to learn than it was for me to learn; whether I'm teaching in person, online, or in print."*