Welcome to the NYExUG Jun 2010 Meeting

- ***Group Details:*** *meetings (2nd Tue of every month) open to all, free, pizza dinner included, raffles at end of meeting, 2 mailing lists (announce – sign-up via emailing join@nyexug.com or meetup.com/exchange).*

- ***Upcoming Meeting*** *– Exchange 2010's Retention/Archiving/Discovery Features Explained.*

- ***New Raffle Opportunities*** *(bring a new member and get an additional raffle ticket)*

- *Meeting Topics Ideas – let me (Ben Serebin) know.*

Presented June 8, 2010 at NYExUG Meeting
Updated on June 10, 2010

Exchange Server Disk Virtualization Best Practices

Superscript numbers (e.g. word[1]) throughout presentation are for additional reference information in back of presentation on Noted References page.

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If you can't get enough Exchange & technology read my blog http://blog.reefsolutions.com

About Ben Serebin

- Working in the IT sector since 1996
- Specialty is Exchange Server, Spam Filtering, DNS, & Wireless.
- Background on Completed Project Q2 10: consolidated 2 physical servers into 1 new Hyper-V R2 server (4 Vs.), seeded 4TB of client data into REEF offsite network based replication backup server (using AppAssure Replay), deployed 12TB iSCSI storage solution into production, & increased REEF backup storage (Ahsay & AppAssure) to almost 15TB.
- Current Projects Q2/3 10: planning design of geographic diverse Exchange backup solution using AppAssure Replay 4.3 release via my TX colo server, deploy new BES 5 Express, & re-configure TX colo server for virtualization (most likely Hyper-V R2).
- Current Environment: Running Exchange 2007 Server on Windows 2008 on ESXi 4, server computing environment is entirely virtual, DC1 on ESXi 4 and DC2 on Hyper-V R2 (Windows role), Blackberry Enterprise Server 4.x, running on VMware ESXi 4. Current handheld email device is a BlackBerry Bold 9000.
- My PPTs are focused on conveying a tremendous amount of technical information in a short amount of time. If I had a presentation assistant, they would be prettier as well. So, any questions, do not hesitate to ask.

Recap on Virtualization and Exchange Server

- Virtualization works for the vast majority of applications on the market.
- Good for file servers, printer servers, web servers, vpn servers, domain controllers, terminal servers, application servers (e.g. SQL, BES, Anti-Virus), AND **Exchange Servers** (all 2003 roles, and all but 1 role for 2007 & 2010).
- Bad for fax servers, Exchange unified messaging, specialty hardware (e.g. Firewire, SCSI tape drives, etc),
- <u>Is Exchange with virtualization Microsoft Support supported? YES! YES! And YES! And you do NOT need to run Microsoft virtualization software.</u>

This should look familiar for those who attended the Sept 2009 meeting that was focused on Exchange virtualization.

Microsoft's Exchange Support Policies[2] Explained

Current as of June 7, 2010 via primary sources by Ben Serebin.

Microsoft has established "*joint support relationship for non-Microsoft hardware virtualization*" with: Cisco, Citrix, Novell, Oracle, Sun, Unisys, Virtual Iron, and VMware. [2a.] In English, this means, MS will support production VM's in select virtualization solutions (see SVVP below).

Microsoft customer with premier-level support running non-Microsoft hardware virtualization from vendor with which Microsoft does not have an established support relationship [see above]… Microsoft **will** investigate potential issues. Meaning, if you have a premier-level support contract, you could write/develop your own virtualization solution and they would help.

Microsoft has a program designed to identify which non-Microsoft VM solutions are supported. The program is called Windows Server Virtualization Validation Program (SVVP). The following products are Microsoft validated and supported to run Microsoft products: Cisco WAAS Virtual Blades 4.1, Citrix XenServer 5 & 5.5, SUSE Linux Enterprise Server 10 SP2, VMware ESX ESX/ESXi 4.0 and much more. The list currently includes 32 products and versions. [5a]

Microsoft supports 40+ applications (Exchange 2003 SP2+, Exchange 2007 SP1+, Exchange 2010, Forefront for Exchange, ISA, SBS 2008, EBS 2008, SQL 2005/2008, Search Server, etc) in a virtualization environment as listed in SVVP or Server 2008 with Hyper-V or Hyper-V Server 2008. [7]

Microsoft's Exchange 2003, 2007, and 2010

<u>Exchange 2003 SP2+ – supported by Microsoft Support</u>

- Only Microsoft Virtual Server 2005 R2 and later
- VMware supports Exchange Server 2003 and there is ample evidence this works well (I run numerous clients in this configuration). This is not supported by Microsoft.

<u>Exchange 2007 SP1+ – officially supported by Microsoft</u>

- SVVP products (e.g. VMware ESXi & ESX) for Windows Server 2008 OS and Hyper-V.
- All roles for Exchange Server supported except Unified Messaging (technical reason for this: timing issue with voice).

<u>Exchange 2010 - officially supported by Microsoft</u> [5]

- Same as 2007 so no UM role.

Background on types of Virtual Disks

There are really only 2 types disks. Each vendor uses their own terminology.

VMware ESX/ESXi 4

- 1) Thick – this is the traditional hard drive type disk. Whatever you create a disk of this size, is what is used on the storage location. So, create a 100GB disk, and this will use 100GB. Storage location being DAS, NAS, or SAN.

- 2) Thin - Thin-provisioned disks are virtual disks that "appear" to the OS as one size, but only consume up to the amount of data that is actually in use. So, a 10 GB drive that is 50% filled with data, would only 5 GB on disk.

  Tip: maximum disk size varies with initial formatted "block" size. When you format your Datastore (storage location), select 8MB to get the largest disks possible (2TB).

  FYI: did you know ESX supports 10 types of disks which are varying types of thick & thin disks (e.g. zeroedthick, eagerzeroedthick, rdm, rdmp, raw, monoflat, etc). Most should not be used unless you know what you're doing.[9]

Microsoft Hyper-V (and later)

- 1) Fixed – same as "thick" above

- 2) Dynamic – same as "thin" above

  FYI: maximum size of a VHD is 2040 GB (8 GB short of 2 TB).

Additional Virtual Disk Options

- iSCSI connection (via hardware virtualization host or within the VM OS) – are network based SCSI commands. Instead of a SCSI cable providing communication, this is done over Ethernet. The iSCSI connection can host a virtual disk (2TB limit) or be a formatted file system such as NTFS/VMFS (no limit).

- SCSI pass-through storage – is a Windows device driver (think Hyper-V only) that allows a SCSI device to be made available as a volume in block-level format. Configured at the host level and dedicated to one guest machine.

- Raw Device Mapping (RDM) – similar to a SCSI pass-through volume but located on a VMware file system (VMFS). This is VMware's approach.

- Hyper-V – Virtual IDE or SCSI. If you install a pre-2008 OS, you'll need to use virtual IDE disks. For 2008 and later, you can select virtual SCSI. Main difference is number of disks available in an OS. Virtual IDE is limited 4 and virtual SCSI is limited to 64. Reason has to do with slipstreamed drivers in install media.

- Hyper-V - Virtual IDE or SCSI – which is faster? Integration Components in the OS makes them equal.[6]

There are 3 types of virtual disks that are supported:

- 1) Fixed/Thick disk, 2) SCSI pass-through storage, or 3) iSCSI storage targets.

Microsoft's Exchange Server Support Stance (& Reality)

- Fact: Thin or Dynamically expanding Virtual Disks are **not supported**.
- Reality: Can be used in smaller environments with 50-100 users even if the I/O on the Exchange Database and VM is **NOT** properly configured. If properly configured, you can handle environments with thousands of users.
- Fact: Microsoft does **not state** if iSCSI target LUNs (storage locations) can be thin provisioned or not. Follow iSCSI vendor's recommendation for Exchange Server.
- Reality: Thin provisioned iSCSI targets even for large environments is acceptable. Smaller environments need not worry, but larger environments need to insure they monitor I/O or deploy with a major SAN vendor (Dell, HP, NetApp, EMC, etc).
- Fact: Virtual disks that use differencing or delta mechanisms (e.g. differencing VHDs or snapshots) are **not supported**.
- Reality: Do NOT snapshot your Exchange Server during production hours unless an emergency. All snapshots should occur while VM is powered off, BUT do not keep snapshots for long (e.g. more than a few days since there is an I/O penalty when you delete them especially for VMware such you can keep multiple snapshots.

<u>Microsoft's Exchange Server Support Stance</u>

- Fact: Exchange 2007 that is Exchange clustered (e.g. CCR, LCR, SCR, SCC) in hardware virtualization environments is **not supported if the hypervisor supports VM clustering** (e.g. Live Migration, VMotion). BUT, All four Exchange 2007 clustered configurations are supported in a virtualized environment.

- Reality: This is most likely due to lack of testing for this stance. VMware's HA functionality (e.g. VMotion & VMotion Storage) are acceptable to use. If you are using VMotion/Live Migration often, I would be concerned about your hardware infrastructure and look to replace it.

- Fact: Exchange 2010 DAG clustering has the same limitation as above.

- Reality: My stance is the same as Exchange 2007, it's acceptable to use.

- Fact: Use of iSCSI initiator inside an Exchange guest virtual machine is supported.

- Reality: Avoid. The only reason to use this is if portability for DR is more important than performance. Easier to bring back the server from the dead if iSCSI is within the OS then host based.

Virtual Disks Recommendations

- For Hyper-V hosts with anti-virus, do not install or permit anti-virus to scan VHD files

- For Hyper-V hosts, try and use the OS Core version for better performance, smaller attack surface, and prevents other IT techs from installing apps.

- Avoid snap-shots on running Exchange 2007 & 2010. Shut-down VM & then snap-shot.

- When in doubt about I/O usage of your VMs, use RAID 10 for best performance. You'll never get fired for this configuration.

- If in I/O performance doubt or want Microsoft Support, use fixed disks for OS disks & Exchange Mailbox Roles.

- Use thin/dynamic disks for low I/O based roles & VMs.

- If your environment can support it, use dynamic disks for as much as you can since it's much more efficient with space. The performance difference is low single digits (2-4%). The benefit for most is worth it.

- For large deployments, use separate LUNs for databases and log files should be isolated in accordance with Exchange 2007 storage best practices.[3] Exchange 2010 changes this due to sequential I/O pattern of trans & edb files.

iSCSI Recommendations

- With iSCSI, use MPIO for Exchange Mailbox Servers and other high I/O need disks.
- When using iSCSI storage, the best performance is achieved when the iSCSI Initiator component is configured on the host machine, and the disks are presented to the guest machine as pass-through disks.[4]
- Dedicate physical network interface cards for iSCSI network traffic & separate dedicated NIC for management traffic. Segment the iSCSI traffic from your regular network/internet traffic.
- Avoid iSCSI in VM OS since performance inside a virtual machine is not as full-featured as a non-virtualized network stack (for example, a virtual network stack does not support jumbo frames), but portability is available.

Noted References

- 1 – Microsoft's Exchange Server 2010 System Requirements http://www.microsoft.com/exchange/2010/en/us/system-requirements.aspx
- 2 – Microsoft Support Policies http://technet.microsoft.com/en-us/library/cc794548.aspx
- 2a – Microsoft support partners list for non-Microsoft supported hardware virtualization http://support.microsoft.com/?kbid=944987
- 3 – Microsoft Exchange 2007 Planning Storage Considerations http://technet.microsoft.com/en-us/library/bb124518%28EXCHG.80%29.aspx
- 4 - Microsoft Support Policies and Recommendations for Exchange Servers in Hardware Virtualization Environments http://technet.microsoft.com/en-us/library/cc794548%28EXCHG.80%29.aspx
- 5 - Exchange 2010 System Requirements - http://technet.microsoft.com/en-us/library/aa996719.aspx
- 5a – Microsoft Windows Server Virtualization Validation Program
- http://www.windowsservercatalog.com/svvp.aspx
- 6 - Storage options for Windows Server 2008 Hyper-V - http://blogs.technet.com/b/josebda/archive/2008/02/06/storage-options-for-windows-server-2008-s-hyper-v.aspx
- 7 – Microsoft Exchange Virtual Disks Supported http://technet.microsoft.com/en-us/library/cc794548%28EXCHG.80%29.aspx
- 8 – Microsoft MSDN SCSI Pass Through Interface - http://msdn.microsoft.com/en-us/library/ff565348.aspx
- 9 – VMware Types of disks supported by ESX/ESXi http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1022242

Thank you for attending the June 2010 NY Exchange User Group Meeting.

Raffles – do not forget, if you bring in new members, you 2x, 3x, or more your chances to win raffle prizes.

TechHit.com (Outlook add-ons) – raffling off any one of their products (SimplyFile [intelligent filing], EZ-Detach [easily detach multi-emails of attachments], MessageSave [backup, archive, save msgs], AutoRead [mark as read/remove new mail icon], & QuickJump [quickly open/move between Windows folders].

Now for Question of the Month……

Question & Answer of the Month

Q) How many methods of disk virtualization are supported for Exchange?

3. 1) Fixed/Thick disk, 2) SCSI pass-through storage, and 3) iSCSI storage targets.

Bonus Question: Which versions support which method? Exchange 2003 SP2, Exchange 2007 SP1, and Exchange 2010 support all 3.

http://technet.microsoft.com/en-us/library/cc794548%28EXCHG.80%29.aspx

See you next month…