Simplified Technology Solutions, Inc

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The IT Solution



Analysis and Design Assistance | Custom Application Development | Systems Integration Services

Running IBM Lotus Domino on VMware

Or “We want to virtualize *absolutely everything*”

For “the” MWLUG!

IBM Business Partner

vmware professional PARTNER

Java • Lotus Domino • .NET • SQL • BlackBerry

About me – my fav slide

- Domino consultant for over a decade
- Domino, VMware and BlackBerry certified
- http://blog.darrenduke.net
- Oddles of DAOS and VMware experience
- Oh and http://ThisWeekInLotus.com
- Oh and @DarrenDuke on the Twitternets

Agenda

- Myths, Truths and Old Wives Tales
- Should you virtualize?
- Easy ones and the basics
- Performance
- Domino infrastructure
- Vmware infrastructure
- Finally....

Myths, Truths and Old Wives Tales

- Can you run Domino on VMWare?
  - Yes, but only with proper planning, testing and tuning. And testing. Oh and test.
- One should not run high I/O apps (like e-mail) in VMWare
  - False, but you should plan, test and tune
- The bottlenecks are not always where you think

Why you should virtualize

- Your boss tells you that you have to - ;)
- You have a business case:
  - For DR/HA via VMware Site Recovery, et al
  - Consolidation/Upgrade refresh
  - Consolidation of servers
  - Ease issues with hardware upgrades
  - Your current Domino server is 15 years old
    - No, really we see this *all the time*

Why you should NOT virtualize

- Your boss tells you that you have to
- You are doing it to be “cool”
- You are lacking a specific business case
- You are using a pSeries or an iSeries
  - Really? You want this kind of headache?
  - You already have 99.999% up-time
- You have lots of iNotes users and run Windows
- To replace Domino clustering

The easy ones

- Do not use any P2V tool
  - Rebuilt it, they will come
  - Crap in, crap out
- Start small, pick BES not a 2,000 user mail server
  - You will learn a whole lot!
- Know what you current environment is doing before you virtualize it

The easy ones - cont

- Know your hardware
  - And the impact Domino 8.5.x will have on it
- Are you currently using shared storage?
  - Are you going to it during this “migration”
- Know the license ramifications
  - Speak to your IBM Partner about this. This is important!
  - PVU to vPVU, Nehalem, etc

The easy ones - cont

- Domino virtualization is a team sport
  - Domino admins
  - SAN admins
  - Network admins
  - VM admins
- But each has a different agenda
  - You can please some of the people some of the time.....

The Basics

- Domino runs best on a single or dual vCPU
  - Try it, you'll see, however try to keep your v-specs the same as a physical server
- Storage options
  - As fast as you can afford, both drive speed and connectivity
    - 15k+ RPM and smaller sized drives are better
  - RAID 10 can be your friend
  - Local
  - SAN/NAS or an XIV (they are fasssssst)

The Basics - cont

- We are talking about ESX and ESXi
  - Not VMware Server
  - Not VMware Workstation
  - And certainly not HyperV
- Yes, ESXi is absolutely fine
  - Buy support if you plan to run in production
    - Platinum = 24 x 7
    - Gold = 12 x 5

The Basics - cont

- Your not still running ESX 3.x are you?
  - Time to move up
  - ESXi the the new ESX by the way
  - Yes the new licensing is stupid
  - Never thought I'd say “PVU seems good now”
- Never, ever, let the server RAM balloon
  - Give it all the RAM is wants
  - vSphere 4 is your friend

Performance RAM

- If you are using 64 bit Windows
  - Use a 64 bit Domino server
  - Give it as much RAM as you can
    - Like 16GB
- For 32 bit Windows
  - Give it 4GB of RAM
- Enable “unlimited” memory in VIC

Performance RAM - cont

- If you are using Linux
  - It doesn't have the RAM issues Windows has
  - Give it 4 to 8GB RAM
- Do not, ever, let the server RAM balloon
  - Give it all the RAM is wants
  - Manage the guests to keep it from over subscribing

Performance – SAN Disks

- A single LUN per VM disk
  - Do not share!
    - This is why RDMs can look, feel and behave faster
  - This can be a VMDK (see above)
    - In 4+ VMDKs can be better than RDMs now
- Separate LUN for OS, Page and Domino code
- Separate LUN for Domino Data
- Separate LUN for Transaction Logs
- Yes, your SAN admin will hate you!

Performance – SAN Disks

- Neither NFS nor 1GB iSCSI is recommended
- Fast HBA and fabric
  - 4Gb is 2x faster than 2Gb
  - 8Gb is 2x faster than 4Gb
  - No, it really is that simple
- Follow best practices for your SAN and fabric
  - Be sure to align if you need to

Performance – Other disks

- Local disk
  - Multiple servers on same local disk...NO!
    - Not supported by IBM
    - Well, maybe if you have 100 or so users
  - RAID 10 is your friend
  - Can use local disk tx logging for low user counts
    - < 250, be sure to test
- NFS
  - Use this only for ISOs and exe storage

Performance – Stats

- Domino Statistics
  - Disk Queue length should be as close to 2
  - Degraded if >= 12, significantly so
- ESX
  - Esxtop is your friend, see what your server is doing
  - Disk latency
    - 5ms is ideal
    - >= 10ms needs looking at

Performance – Stats

- If you have an issue, needle in a haystack
  - SAN cache
  - Incorrect fiber configuration
  - Slow SAN
  - HBA configuration issues
- Know your hardware before you load it
- iSCSI @ 10G Ethernet
- Fiber @ 4+ Gbps (8 if you plan on scaling)

Performance – Disk types

- Like religion, politics and anti-virus providers...
- VMDK vs RDM
  - I personally have seen better performance *post implementation* using RDM (see below on why)
  - However, IF you to adhere to one VMDK per LUN
    - This can be faster and recommended
- Bottom-line, test, test, test
  - Prior to *implementation*
- Align if needed - http://tinyurl.com/y3gdup

Performance – Networking

- Segment different traffic to separate physical NICs
  - Server to server (non cluster)
    - Replication
    - Mail routing
  - Server to client, client to server
  - Clustering
- Remember 10 vNIC max per VM, use them
- If you have the CPU cycles, compress the TCP port traffic (on Domino)

Performance – Networking - cont

- If your bottleneck is not disk I/O then
  - It is probably NIC related
  - They are cheap, yet time and time again we see issues in this area
  - It could be your switches or the configuration thereof
    - Linksys != Cisco

Performance – Domino

- Disable all un-used tasks in the server notes.ini
- Disable TX Logs for ancillary NSF files
  - See Andy Pedisich's blog, http://tinyurl.com/lqwv8v
- Make sure your VMDK versions are updated
- Domino 8.5.x has 30-35% less I/O
- Prevent ballooning at all costs

Performance – Domino - cont

- Are you sure you need to AV scan EVERY write?
  - Investigate having a central AV Domino server
  - Maybe even (shock!) a non VM
- Install VMware Tools (and keep updated)
  - Ensure OS time is sync'd
- Separate LUNs
- Start with 2 vCPU
  - Work up if needed
  - UPDATERS=x (where x is vCPU count)

Domino Infrastructure

- Using LDAP?
  - Create a Domino server just for that
  - You can have more than 1 LDAP server
- Move the Administration Server to distinct Domino server, makes future upgrades simple
- You may need to mix and match drive types
  - VMDK for data
  - RDM for TX Logs

Domino Infrastructure - cont

- N/D 8.5.1 and DAOS is your friend
  - Server to server replication
    - DAOS will NOT resend known NLO's
    - Does not work for clustering
  - Client to server
    - Reply, reply to all and forward will NOT send (from the client) known NLOs
  - Less network, less I/O, less CPU

Domino Infrastructure - cont

- Do not try to match your physical servers
  - One 8 way x64 != One single vCPU ESX guest
  - Split the load between many, smaller guests
  - Keep away from 4 vCPU guests
    - Indeed, try to keep to >= 2 vCPU
- Do not share NICs with Domino
  - Give each Domino guest a dedicated NIC
  - Compress TCP port on server AND client

VMware Infrastructure

- Watch your shares
  - Both RAM, CPU and disk
  - Assign as appropriate
- Jumbo frames and vLANs *can* be your friend
- Do you really need to DRS or HA Domino?
  - Domino clustering is much, much easier
  - High I/O loads are slow to DRS
- Do not over commit resources Domino hosts

VMware Infrastructure - cont

- Remove snapshots as soon as practicably possible
- Don't forget to defrag Windows guests
- vSphere 4 can be 3-10% faster depending on loads
  - Only runs on x64 host hardware
  - For x32 hosts you will still need ESX 3.5
- Intel Nehalem CPUs can provide a boost w/4.x

VMware Infrastructure - cont

- Keep your ESX servers patched and current
  - Including U levels
- Watch for updated drivers from VMware
  - See if they are a better match for your environment
  - Specifically NIC drivers, jumbo frames, etc

VMware Infrastructure - cont

- The IBM and VMware joint white paper:
  - http://tinyurl.com/3kppthc
  - Remember they have NO OTHER guests on the hosts here
  - Covers 8.5.1
  -

And Finally....

- There is no silver bullet - sorry
- Each VMware environment is different
- Test, test and test
- Try different configurations
  - Server.Load / NotesBench
- In production, be sure to monitor
  - VMware AppSpeed
- YMMV (your mileage may vary)

We are here to help

- For further information contact or to schedule services
  - Lisa Duke, lisa.duke@simplified-tech.com or 678 378 4278
  - Ernie Sutter, ernie.sutter@simplified-tech.com or 404 931 5786
- Lots more information on the STS web site and blog:
  - http://www.simplified-tech.com
  - http://blog.darrenduke.net
  - Twitter – be sure to follow darrenduke and simplifiedtech
- We are an authorized IBM, RIM, VMware and Symantec reseller for new sales and renewals
- R6.5 is being “End Of Life” in April 2010.