

MDC9700 - Top 12 Ways to Improve Guest Server Performance Under VMware ESX Server

David Marshall
Surgient Senior Architect

Wade Reynolds
Surgient Senior Architect



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Overview

- Why do you need to optimize your guest servers on ESX?
- Host Server Configuration Tips
- Virtual Machine Configuration Tips
- Guest Environment Tips
- Q & A
- Resources

Tip 1: Upgrade to VI3

- Increases the maximum memory limit of a virtual machine from 3.6GB to 16GB
- Gain the ability to use up to 4-way Virtual SMP
- Distributed Resource Scheduler (DRS)
- High Availability (HA)
- Resource Pools
- Consolidated Backup
- Support for up to 20 physical network adapters

Tip 2: Host Processor and Memory Improvements

- Use the highest performance processors as possible
- Add as many processors as possible
- Optimize the ratio between the number of VMs and physical processors
- Add as much memory as possible on your host
- Avoid over committing memory on the host when performance is paramount

Tip 3: Enhance Storage

- Use the fastest storage I/O subsystems as possible
- High performance disk controller
 - Split the I/O across multiple channels when available
 - 128MB or more cache on the controller
- 15K RPM Ultra320 Disks, 10K RPM LFF SAS Disks
- 4Gb FC SAN
- Configure virtual machines to use the LSI Logic Virtual SCSI Controller and ensure that the appropriate drivers are available
- Adjust I/O shares as necessary

Tip 4: Optimize Networking

- Use Gigabit Ethernet network adapters on the host server
- Adjust network adapter link speed and duplex
 - 100Mbit/full duplex for Fast Ethernet
 - Auto Negotiate for Gigabit Ethernet
 - Ensure that the physical switch ports are set to the same settings
- Leverage network adapter teaming for load balancing and fault tolerance
- Configure virtual machines to use VMXNET or e1000 virtual network adapters

Tip 5: Be Aware of VM-to-Host Placement

- Shutdown and power off or suspend other virtual machines that are not needed.
- Try to keep heavy load VMs on different hosts or keep only those together that are used at different times
- Take advantage of DRS in VI3
- Take advantage Resource Pools in VI3

Tip 6: Use Remote Access Carefully

- Close all unnecessary VMware Remote Console sessions
 - Remote console sessions consume CPU cycle through the service console, even when idle
 - VMRC should only be used as a KVM for occasional administrative access or when console access is explicitly required

- Use guest-oriented remote control technologies instead
 - Citrix
 - RDP / Terminal Services
 - Telnet
 - SSH

- Not all guest-oriented remote access methods are created equal
 - VNC may consume too many resources

Tip 7: Virtual Machine Process and Memory

- Use Virtual SMP sparingly. Most virtual machines have better performance with a single virtual CPU.
- Allocate only as much memory to each VM as needed. Avoid giving VMs too much memory as this practice is wasteful and usually does not improve the VM's performance.
- Set each VM's minimum and maximum CPU resource allocation percentages.
 - Set minimum percentage to avoid CPU starvation
 - Set maximum percentage to stop low-priority VMs from consuming too many CPU cycles
- The default CPU Affinity settings (no affinity) is usually the best choice for most situations. Only set a VM's CPU Affinity when absolutely necessary.

Tip 8: Remove Unneeded Virtual Hardware

- Disable and/or remove any virtual hardware components that are not being used.
 - CD/DVD-ROM Drives
 - Floppy Drive
 - Network Adapters
 - COM ports
 - LPT Ports

Tip 9: Be Sure To Install VMware Tools

- Install the most recent version of VMware Tools for your version of VMware ESX Server
- Allow ACPI enabled-kernels to be utilized
- Enable time synchronization between the ESX host and the guest
- Disable NTP or other time synchronization in the guest OS
- Enable hardware acceleration in the video settings

Tip 10: Optimize Windows Guest Operating Systems

- Defragment logical volumes, including the page file
- Enable write-through cache
- Disable unneeded services
- Disable or remove unnecessary startup tasks
- Disable NTFS Last Time Accessed updates
- Disable visual effects
 - Remove desktop backgrounds/wallpaper
 - Turn off mouse pointer shadows
 - Disable showing window contents while dragging
- Disable System Restore (Windows XP)
- Optimize Power Settings
 - Disable hibernation
 - Disable power management features
- Disable user screensavers and the system login screensaver

Tip 11: Tuning Linux Guest Operating Systems

- Use a distribution with a 2.4 kernel when possible
- If possible, do not run X-Windows
- Install only those packages that are necessary
- Optimize the kernel when possible
- Disable or remove all unneeded services, daemons, background tasks
- Use a light-weight window manager

Tip 12: Smart Anti-Virus and Backup Configurations

- Anti-Virus
 - Schedule regular scans to run at off peak hours
 - Optimize the excluded files and directories from virus scans (exclude page/swap files, db files, etc.)
 - Disable real-time anti-virus scanning features

- Backup
 - Schedule backups to occur during off peak hours

Q & A

- We'd like to open it up to the audience for questions

- ...And for future questions, please email us!
 - David.Marshall@vmbook.info

 - Wade.Reynolds@vmbook.info

For more information...

- Advanced Server Virtualization:
VMware and Microsoft Platforms in the Virtual Data Center
<http://www.vmbook.info/>
- VMblog.com
Virtualization Technology News and Information
<http://vmblog.com>
- InfoWorld Virtualization Report
Web site and Podcasts
<http://weblog.infoworld.com/virtualization>
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