

ESX hosts

Maximums: vCPUs per host = 128 Cores/logical procs (incl HT) per host = 32
RAM per host = 64GB RAM allocated to service console (normally 272MB) = 800MB
Export a **detailed configuration file:**
\$ sudo /usr/sbin/esxcfg-info > /tmp/esxcfg-info.txt
Gather **debugging report:** \$ sudo vm-support -w /tmp (\$ vm-support -h to see switches)
After COS changes, refresh VI Client: \$ sudo /sbin/service mgmt-vmware restart

System logs:

ESX 2.x service log	/var/log/vmware/vmware-serverd.log
ESX 3.x service log	/var/log/vmware/hostd.log
Service Console log	/var/log/messages
VMkernel messages	/var/log/vmkernel
VMkernel warnings	/var/log/vmkernelwarning
VMkernel events	/var/log/vmkernelsummary
VC agent log	/var/log/vmware/vpx/vpxa.log
VI Client log	%TEMP%\viclient-x.log
VM log	/vms/volumes/datastore_name/vm_name/vmware.log

Show description of a VMkernel error (only ESX 3.0.2+): \$ vmkernelcode error_code_number
To see the status of all services: \$ sudo /sbin/service --status-all
Restart a service: \$ sudo /sbin/service service_name restart (or start, stop or status)
Boot process: 1) Bootloader (Normal/Debug VMkernel/Service console) - settings in /etc/grub.conf
2) initrd - initial RAM disk (loads VMkernel, device drivers and mounts /root & /proc)
3) VMkernel loads 4) vmnix (Service Console)
5) /sbin/init which runs /etc/inittab (specifies which services run at which level)
6) init script for the runlevel (/etc/rc.d/rc3.d for normal ESX boot) - runs scripts starting 'S' in order.
To list the service **runlevels:** \$ /sbin/chkconfig --list
To check the **filesystem's usage:** \$ vdf -h

Internal firewall (iptables on the Service Console)
Show all the firewall setting: \$ sudo /usr/sbin/esxcfg-firewall -q
List the firewall named services: \$ sudo /usr/sbin/esxcfg-firewall -s
Enable a service: \$ sudo /usr/sbin/esxcfg-firewall -e service_name (-d to disable)
To open a port: \$ sudo /usr/sbin/esxcfg-firewall -o port, protocol, direction, name
To close a port: \$ sudo /usr/sbin/esxcfg-firewall -c port, protocol, direction

External firewall ports (from the ESX host's perspective)

Port	Incoming	Outgoing	Via	Description
80	TCP		Service Console	HTTP access - Web Access & VM console
443	TCP		Service Console	HTTP access (cannot change)
902	TCP	UDP	Service Console	Authentication traffic (cannot change)
903	TCP		Service Console	Remote Console traffic (cannot change)
2049	TCP	TCP	VMKernel	From NFS device
2050-5000	TCP, UDP	UDP	Service Console	HA & Autostart
3260	TCP		Both	iSCSI
8000	TCP	TCP	VMKernel	Requests from VMotion
8042-8045	TCP, UDP	UDP	Service Console	HA & EMC Autostart Mgr
8085, 8087 & 9080				Used internally
27000	TCP		Service Console	To License Server
27010	TCP		Service Console	From License Server

Rename an ESX hostname (safest way, recommended by VMware)

- In VC, put host into maintenance mode (migrate off VMs)
- Release the license (if VC based licensed)
- Under the DNS and Routing section, change the name of the host
- Remove the host from VC
- Login direct to the server with the VI client or via SSH and reboot the server
- Change Host (A) record on DNS servers to reflect name change
- After the reboot, add the host to VC with the new name
- Reconfigure the licensing settings and exit maintenance mode
- Migrate VMs back (ensure VMotion and HA is working as required)
- If necessary, rename hardware remote management tool (iLO, RAS, DRAC)

Check that the change has taken affect:
\$ hostname and \$ cat /etc/hosts and \$ cat /etc/sysconfig/network

Changing the Service Console's IP address (do at console or with remote mgmt card)
\$ sudo /usr/sbin/esxcfg-vswif -i ip_address -n subnet_mask vswif0
\$ sudo /sbin/service mgmt-vmware restart

Edit the gateway and hostname in /etc/sysconfig/network and the ip address in /etc/hosts
\$ sudo /sbin/service network restart

If you are using VST (VLAN) on the the Service Console, you also need to run:
\$ sudo /usr/sbin/esxcfg-vswitch -p PortGroup_name -v VLANid vSwitch0

Patching: 1) Copy the patch to the server 2) Extract the file: \$ tar -xvzf patch.tgz
3) Change to the newly created directory: \$ cd patch
4) Install: \$ sudo /usr/sbin/esxupdate update (-n to prevent a reboot)

Patching logs: /var/log/vmware/esxupdate.log

Mounting USB keys: Run \$ sudo /sbin/Edisk -l before plugging in the key and then run once after its plugged in. The new partition listed will give you the device name.
Create a directory \$ sudo mkdir /mnt/usbkey
Mount the key \$ sudo mount /dev/device_name /mnt/usb
Before removing, unmount the key \$ sudo umount /mnt/usbkey (umount not unmount)

VMs

Maximums: Registered VMs per host = 200 Powered-on VMs per host: SCSI devices = 128
CPUs = 4 RAM = 16GB NICs = 4 Devices per SCSI controller = 15
Floppy drives = 2 IDE devices (CD) = 4 Parallel ports = 2 Serial ports = 2
Remote consoles = 10 Snapshots = 32

VM files

.cfg	Earlier version of .vmx file
.disk	Earlier version of .vmdk file
.hlog	VMotion log file
.lck-XXX	Locking file used on NFS based datastore
.log	A log of VM activity can be useful in troubleshooting.
.nvram	BIOS settings
.REDO	Earlier version of -delta.vmdk file
.std	Earlier version of .vmsx file
.vmdk	disk descriptor (also virtual disk for hosted products)
-flat.vmdk	Raw virtual disks
-delta.vmdk	snapshot differential file
.vmem	VM's memory
.vmsd	metadata and information about snapshots
.vmsn	snapshot state file
.vmsx	suspended state file
.vmtl	VC template
.vmtm	team data
.vmtx	VC template header
.vmx	primary configuration file
.vmxf	supplemental configuration file for VMs in a team
.vswp	Swap file allowing memory over commitment

Non-VMware files

Disk	Config	Suspended State
MS Virt PC/Server	.vhd	.vsv
Xen	.img or .qcow1	.hvm
VirtualBox	.vdi	.xml
Parallels	.hdd	.pvs .sav

If file based, can also use physical partitions, LVM volumes or an NFS root

Domain Controllers
Normally, use the VMware tools to sync guest time with the host and disable the "windows Time Service". However, DCs need the Windows Time Service to be running, so that they can be authoritative for the domain. Set the service to automatic and change
HKLM\SYSTEM\CurrentControlSet\Services\W32Time\Parameters\Type (REG_SZ) to "NoSync" so the VM can still use host syncing.

How to grow VM disks
The easiest option here is to add additional disks, this can be done on the fly. However it will force a new drive letter in a Windows guest.

- Turn off the VM
- SSH to the server and cd to the directory with the VM's files
- \$ sudo /usr/sbin/vmkfstools -X 20G vm_name.vmdk - where 20G is the new size you want for the disk, and vm_name.vmdk is the disk descriptor file. (uppercase X)
- To increase an existing partition, boot the VM off a Parted Magic iso disc (<http://partedmagic.com>) and grow the partition

How to shrink VM disks

- Ensure you have sufficient room on the partition to shrink
- Defrag the partition (can speed up the Parted Magic step)
- Turn off the VM and take a copy of the disk (shrinking is not supported)
- Boot from a Parted Magic (<http://partedmagic.com>) iso disc and shrink the partitions 1GB smaller than planned size of the disc. Ensure the free space is at the end of the disc.
- SSH to the server and cd to the directory with the VM's files
- \$ sudo /usr/sbin/vmkfstools -X --force 20G vm_name.vmdk - where 20G is the new size you want for the disk, and vm_name.vmdk is the disk descriptor file
- Boot from a Parted Magic (<http://partedmagic.com>) iso and increase the partition to fill the disc

List all registered VMs on a host (vmx files): \$ sudo /usr/bin/vmware-cmd -l

Web Access

- Access via ESX host or VC: <https://hostname.domain.com/ui>
- Check the status with: \$ service vmware-webAccess status
if it has stopped: \$ service vmware-webAccess start

Two options are available with Remote Console URLs: 1) Limit view to the remote console - hides details such as event logs. 2) Limit view to a single VM - disables inventory navigation.
These options only affect presentation not access control. Permissions are granted in the VI client.
Browser must be IE6 or Firefox 1.0.8 or higher to be supported. Troubleshooting the Web Browser plugin: Firefox > [about:plugins](#) > "VMware WebCenter Remote MKS Plug-in" should be 2.0.1.0
I.E. > Tools > Internet Options > Settings > View Objects > "QuickMksAxCtl" should be 2.0.1.0

VirtualCenter

VC server requires min of 2GHz CPU, 2GB RAM, 560MB free disk space. This can support 20 concurrent clients, 50 ESX hosts, and over 1000 VMs.
Requires a 32-bit version of Win 2000 Server SP4 with Update Rollup 1, 2003 or XP Pro.
Maximums: VMs = 1500 (2000 with VC 2.5) ESX hosts = 100 (200 with VC 2.5)

Default roles (system roles are permanent and cannot be changed)

No access user	system - Default for all users except those in Admin Gp
Read only user	system - View state & details except console tab
Administrator	system - All privileges. Default for members of the Admin Gp
VM user	sample - Interact with the VM but not its config
VM power user	sample - Change most VM settings, take snapshots & schedule tasks
Resource pool admin	sample - Assigned to resource pool objects
Datacenter admin	sample - Setup datacenters, but limited interaction with VMs
VM admin	sample - All privileges except permissions

Impact of VC Failure:

VM	management through direct connection to ESX Server only
ESX	management through direct connection only
VMotion	No control over functionality
DRS	No control over functionality
HA (Restart VM)	No Impact
HA (Admission Control)	No control over functionality

VC supports the following databases:

- MS SQL Server 2000 (SP 4 only)
- MS SQL Server 2005 SP2 (both 32 bit and 64 bit) - from VC 2.0.2
- Oracle 9iR2, 10gR1 (versions 10.1.0.3 and higher only), and 10gR2
- MS MSDE (not supported for production environments)

MS Windows NT authentication is not supported with remote SQL Server.
VC logs: %TEMP%\vpx/vpxd-#.log
Check Windows firewall ports: netstat -a -b and log: c:\WINDOWS\pfirewall.log
VC install logs: %TEMP%\ directory of the user that installed the software

License server

License server requires min of 266MHz CPU, 256MB RAM, 25MB free disk space. Requires a 32-bit version of Win 2000 Server SP4, 2003 or XP Pro.

Possible license key types:
PROD_ESX_STARTER, PROD_ESX_FULL, ESX_FULL_BACKUP, PROD_VC, VC_ESXHOST, VC_VMOTION, DRS_VC_DRS, HA_VC_DAS

Licenses are based on:

Feature	ESX or VC based	per-processor or per-feature based
ESX Server (Starter or Standard)	ESX Server	per-processor
VC	VC	per-feature
VC Agent for ESX Server	VC	per-processor
VCB	ESX Server	per-processor
Vmotion	VC	per-processor
HA	VC	per-processor
DRS	VC	per-processor

Impact of a License Server Failure:

Component	Attempted Action	Grace Period (14 days)	After Grace Period
VM	Power On	Permitted	Not Permitted
	Create/Delete	Permitted	Permitted
	Suspend/Resume	Permitted	Permitted
ESX Host	Configure with VI Client	Permitted	Permitted
	Continue Operations	Permitted	Permitted
	Power On/Power Off	Permitted	Permitted
VC Server	Configure with VI Client	Permitted	Permitted
	Modify Host-Based License File	Permitted	Permitted
	Remove an ESX Host from Inventory	Permitted	Permitted
	Add an ESX Host to Inventory	Not Permitted	Not Permitted
	Connect/Reconnect to an ESX Host	Permitted	Permitted
	Cold Migrate a VM Between Hosts	Permitted	Permitted
	Move an ESX Host Among Folders	Permitted	Permitted
	Move an ESX Host into/out of Cluster	Not Permitted	Not Permitted
	Configure VC with VI Client	Permitted	Permitted
	VMotion a VM Between Hosts	Permitted	Not Permitted
Any Component	Continue Load Balancing within DRS Cluster	Permitted	Not Permitted
	Restart VMs within Failed Host's HA Cluster	Permitted	Not Permitted
	Any Add or Remove License Keys	Not Permitted	Not Permitted
	Component Upgrade	Not Permitted	Not Permitted

License server log:
%ALLUSERSPROFILE%\Application Data\VMware\VMware License Server\lmgdr.log
and logs under: %ALLUSERSPROFILE%\Application Data\Macrovision\FLEXlm