ESXi Hosts

Maximums (per host): Logical CPUs (incl HT) = 160   RAM = 2TB   VMs = 512
vCPUs = 2048   vCPUs per core = 25

FW Port	Source	Destination	Protocol	Description
22	SSH client	ESXi	TCP	SSH server
53	ESXi	DNS server	UDP	DNS requests
80	Clients	ESXi	TCP	Redirects to HTTPS (443)
123	ESXi	NTP source	UDP	NTP (time) client
427	ESXi	CIM servers	UDP	CIM SLPv2 client to find server
443	Clients, vCenter	ESXi	TCP	HTTPS access
902	ESXi	ESXi	TCP/UDP	Migrate & provision
902	Client	ESXi	UDP	Access to VM console
902	ESXi	vCenter	TCP/UDP	Heartbeat
5900-5964	ESXi	ESXi	TCP	RFB for management tools-VNC
5988	CIM server	ESXi	TCP	CIM transactions over HTTP
5989	vCenter/ESXi	ESXi/vCenter	TCP	CIM XML over HTTPS
8000	ESXi	ESXi	TCP	vMotion requests

Possible extras:68(DHCP), 161/162(SNMP), 514(syslog), 1234/1235(HBR) & HA,FT,NFS,iSCSI traffic

Logs: All in /var/log/ directory (sym links from /var/run/log). View host logs via: • DCUI • ESXi Shell •
Extract vm-support bundle • http://hostname/host • vCLI vifs • vSphere Client to host.

auth.log	ESXi Shell authentication
esxupdate.log	ESXi patches/updates
fdm.log	HA logs
hostd.log	Host management (VM & host events; Client, vpxa, SDK connections)
shell.log	ESXi Shell usage (enable/disable & commands
sysboot.log	VMkernel & module startup
syslog.log	Management service initialization, watchdogs, scheduled tasks, DCUI
vmkernel.log	Core VMkernel logs (devices, storage/network device/driver events & VM startup)
vmkwarning.log	VMkernel warnings & alerts
vmksummary.log	ESXi startup/shutdown, uptime, VMs running, service usage
vpxa.log	vCenter vpxa agent

Shell Commands

--help for esxcli namespaces & commands relative to location. localcli bypasses hostd
Startup level for management services (& lists all services):   chkconfig --list
Restart all management services: /sbin/service.sh restart
Restart single service (& start|stop|status available): /etc/init.d/<service> restart
Common services: • hostd (primary ESXi daemon) • vpxa (vCenter agent) • vmware-fdm (HA)
Backup host configuration: vicfg-cfgbackup -s /tmp/<hostname>.cfgbak
    (restore -l, force restore to different build number -f)
Export detailed configuration file: esxcfg-info > /tmp/esxcfg-info.txt
Gather debugging report: vm-support -w /tmp
List running VMs (before maintenance): esxcli vm process list
Resource usage: esxtop (Shell) resxtop (vCLI). Customize & save: W (update .esxtop50rc file)
List CPU details: esxcli hardware cpu list
Show CPU supported functions: esxcli hardware cpu global get
Show memory and NUMA nodes: esxcli hardware memory get
List free memory allocated to ramdisks: esxcli system visorfs ramdisk list
Show version information for ESXi: esxcli system version get
Show the host's acceptance level: esxcli software acceptance get
Show all the installed VIBs: esxcli software vib list
Detailed information on installed VIBs: esxcli software vib get
Show syslog configuration: esxcli system syslog config get
Show logging config for each log: esxcli system syslog config logger get
Show remote coredump config: esxcli system coredump network get
Lists firewall status and actions: esxcli network firewall get
Lists firewall rulesets: esxcli network firewall ruleset list
Refresh firewall after adding new ruleset: esxcli network firewall refresh

Next 3 useful enough to include???

Show description of VMkernel error: vmkerrcode <error_code_number>
Lists drivers loaded at startup: esxcli system module list
List advanced options: esxcli system settings advanced -l

Power management policies: • Not Supported - no host support or disabled in BIOS • High Performance - only used when BIOS warning • Balanced (default) - conservative, shouldn't affect performance • Low Power - aggressive power management, can lower performance • Custom
Memory: Host reclaims memory from VM by: • TPS (Transparent Page Sharing) – "RAM dedupe", PSHARE in esxtop • Balloon driver (vmmemctl) - forces guest to use native algorithms (guest swap) • Memory compression • .vswp file (host level swapping). Local or networked SSD tagged is by VMkernel as optimal swap location to reduce impact. During contention, host memory allocated based on shares & working set size (recent activity). Idle memory is taxed progressively to prevent VM hoarding. Guest swap ≥ (vRAM - Reservation) x 65%, or balloon driver can cause guest kernel panic. Faults can be detected & quarantined to reduce chance of a PSOD (hardware dependent).
Large Pages?
NUMA (Non-Uniform Memory Access): CPUs have localized memory. NUMA scheduler controls VM distribution across host memory to dynamically optimize CPU load & memory locality for VMs.
Firewall: Define service's port/protocol rule set: /etc/vmware/firewall/service_<name>.xml, then refresh firewall.
PAM (Pluggable Authentication Modules) plugins: /etc/pam.d/vmware-authd. Default password compliance plugin: pam_passwdqc.so. No restrictions on root password. Defaults for non-root users: password retries = 3, minimum password length = 8, shorter passwords if Characters Classes mixed (upper, lower, digits & other) 1 or 2 CC – min 8, 3 CC – min 7, 4 CC – min 6. First character as upper or last character as digit not counted.
VIBs: can update image profiles or 3rd party extensions. Updates firewall ruleset & refreshes hostd. "Shift + R" during startup to revert to previous boot image after an update.
DCUI (Direct Console UI): • Configures host defaults • Sets up administrative access • Troubleshoot. High contrast video mode F4. Can redirect DCUI to serial cable via Client or boot option (Shift +O). Restarting Mgt agents effects /etc/init.d processes: hostd (mgmt-vmware), ntpd (time), sfcbd (CIM broker), slpd (discover/advertise services), wsman (share mgt info via SOAP), vobd (error reporting) & fdm (HA agent) if installed. To isolate ESXi host from DRS/HA cluster, disable management network. Management Network Test: pings DG, primary DNS nameserver, secondary DNS, resolves hostname.
ESXi Shell (was TSM): Repair mode on ESXi Installable CD overwrites all configuration data. VMFS is preserved if it is original location on boot disk (or beyond 900MB partition), or another disk. Serial number lost on repair, but restored when backup configuration applied. Configuration reset deletes root password, removes configuration & reboots host. Storage needs reconfigured & re-register VMs.
SNMP agent embedded in hostd (disabled by default). Enable via vicfg-snmp. Can send traps & receive polling (GET) requests. **Syslog** service is vmsyslogd.
Host certificates: /etc/vmware/ssl/rui.crt (public key) & rui.key (private key). Recreate: /sbin/generate-certificates hostd regenerates new files if not present.
Lockdown mode: Forces operations via vCenter. Mode available only when host connected to vCenter. Enabling/disabling via DCUI wipes host permissions – set via vCenter. DCUI restricted to root, Shell & SSH disabled for all users, vSphere client & CIM monitoring only via vCenter not direct to host. Normal Mode: DCUI, Shell, SSH & CIM access allowed to root & Admin role users. vSphere Client access based on ESXi permissions. Total lockdown mode also disables root access to the DCUI, if vCenter access is lost you must reinstall ESXi to regain control. root & vpxuser are only users not assigned No Access role on hosts by default, but have same rights as the Administrator role.
Master config file: /etc/vmware/esx.conf

Links: Firewall Ports http://kb.vmware.com/kb/1012382
Location of ESXi 5.0 log files http://kb.vmware.com/kb/2004201
Video: Restarting management agents on an ESX/ESXi server http://kb.vmware.com/kb/1003490
Interpreting esxtop Statistics http://communities.vmware.com/docs/DOC-9279
Collecting diagnostic info using the vm-support command http://kb.vmware.com/kb/1010705
Decoding Machine Check Exception output after purple screen http://kb.vmware.com/kb/1005184