

Compliance (Host profiles, esxupdate & VUM)

Maximums (per VUM on 32bit server): ESX hosts = 200 VMs = 200
Maximums (per VUM on 64bit server): ESX hosts = 300 VMs = 4000
Maximums (per VUM): ESX hosts scanned = 72 Hosts remediated = 8 Hosts upgraded = 48
VMs remediated = 48 Win VMs scanned = 72 on/10 off Linux VMs scanned = 145
VMware tools scanned/upgraded = 145 VUM server log file: 2GB
Maximums (per ESX host): VMs remediated = 5 VMs scanned = 6 Win or 145 Linux
VMware tools scanned/upgraded = 145 VM hardware scanned/upgraded = 145
Maximums (per cluster): Host profile = 1 Hosts upgraded via VUM = 1 (sequential)
VUM HW requirements: • 2 logical cores • 2GB RAM (4GB if VUM & vCenter on same server)
VUM Databases: • SQL Server 2005 SP1, 2005 Express or 2008 • Oracle 10g R1/R2 & 11g R1

FW Port	Source	Destination	Protocol	Description
80	Hosts	VUM	TCP	HTTP reverse proxy
80 (out)	VUM	Internet	TCP	Metadata for updates
443	Hosts, VC	VUM	TCP	HTTPS reverse proxy
443 (out)	VUM	Internet	TCP	Metadata for updates
902 (out)	VUM	Hosts	TCP	Updates
8084	VUM client	VUM	TCP	SOAP Server
8084 (out)	VUM	Hosts	TCP	Redirecting port 80
9084 (out)	VUM	Hosts, VC	TCP	Redirecting port 443
9087	VUM client	VUM	TCP	Host upgrade files

Possible extras: 1443(MSSQL), 1521(Oracle), 9000-9100(recommended alternatives for 80/443)
Logs: Host profiles: `/var/log/vmware/PyVnmoiServer.log` esxupdate: `/var/log/vmware/esxupdate.log`
Create VUM log: `C:\Program Files\VMware\Infrastructure\Update Manager\script vum-support.vsf\m`
Host profiles: eliminates per-host configuration & enforces consistency. Requires Enterprise + license.
Exported profiles are .vpf files. Currently cannot do: licensing, vDS policies, iSCSI or multipathing.
Update terminology: • VIB (vSphere Install Module) - single package • Bulletin - one or more VIBs •
Offline Bundle zip - VIBs archive • Patch - bulletin to address issue/enhancement • Depot - online VIBs group • Roll-up - patches grouped for download/deployment • Update - ESX image release.
esxupdate: **esxupdate** ESX only. **vihostupdate** (RCLi/VMA) updates ESX & ESXi. Won't reboot host anymore. **Modes:** • Inspect (query - list bulletins, info - bulletin details) • Scan • Stage (download without install) • Update. Config file: `/etc/vmware/esxupdate/esxupdate.conf`

VUM (vCenter Update Manager): Only 1 VUM to 1 vCenter. Avoid VUM & vCenter on VM managed by same VUM/vCenter. IPv6 support for ESX4(i) hosts, not VMs & not 3.5 hosts.
Client views: • Admin (manage baselines, settings, events, review patches) • Compliance (attach baselines, view compliance, scan/stage/remediate). Compliance status displayed based on permissions.
Staging: hosts do not need maintenance mode. Staged patches replicated to `/tmp/updatecache`
Upgrades: ESX ≥3.0.0, ESX3i ≥3.5, VMware tools, VM HW, Studio Linux vApps.
Patches: ESX ≥3.0.3, ESX3i ≥3.5, Win/Linux VMs.
Baselines: upgrades or patches (dynamic/fixed). **Baseline groups:** can contain upgrade & patch baselines. Upgrades first, then patches. Remediation sequential for hosts in cluster, parallel for multiple clusters. **Default baselines:** • 4 dynamic patch (VM/Host-critical/non-critical) • 4 upgrade (VM tools/HW, vApps-all/critical) - cannot be edited/deleted.
Smart rebooting: selectively reboots VMs in vApp to maintain startup dependencies. May reboot non-remediated VMs. Enabled by default. **Templates:** on, remediated, registry keys restored (to rescue), off.
UDMS (VUM Download Service): downloads patches if VUM cannot get to the internet.
Export patches as shared repository: `..Update Manager\vmware-ums --export --dest repository path`
Download: `..Update Manager\vmware-ums --set-config --enable-host 1 --enable-win 1 --enable-lin 1`

Converter (vCenter version)

Maximums: Concurrent imports/exports = 16 (assuming no load on vCenter server)
VM name = 80 characters (60 recommended as added timestamp can exceed limit)
SW requirements: Win 2000 SP4 U1, 2003 SP2/R2, 2008, Vista SP1, XP Pro SP3 (OS dictates what can be imported). Copy sysprep tools to vCenter. Only 1 vCenter Converter server to 1 vCenter server.

FW Port	Source	Destination	Protocol	Description
22 (out)	Converter	Source computer	TCP	Linux sources
22	Helper VM	Source computer	TCP	Linux sources
137 & 138 (out)	Converter	Source computer	UDP	Hot migration (NetBIOS)
139 (out)	Converter	Source computer	TCP	Hot migration (NetBIOS)
443 (out)	Converter	Helper VM	TCP	Linux sources
443 (out)	Converter	Host/vCenter	TCP	Conversion target
443	Source computer	Host/vCenter	TCP	Conversion target
443	Converter client	Converter	TCP	If different computers
445 (out)	Converter	Source computer	TCP	Conversion (NetBIOS)
902	Source computer	Host	TCP	Cloning
9089 (out)	Converter	Source computer	TCP	Deploying remote agent

Components: • Server • Client • CLI (Win & Linux versions - doesn't require client plug-in. Linux version is separate download) • Agent • Boot CD (peTool adds storage/network drivers).
Conversion: both cloning & system reconfiguration. Cannot create thin-provisioned target disks.
Can schedule unlimited P2V recurring tasks, specifying how VMs are retained. Converter agent must be installed permanently on source. Cannot schedule reconfiguration tasks.
Cloning: **Disk-based** cold cloning & importing VMs. Basic & dynamic disks. **Volume-based** hot & cold cloning & importing VMs. Block level (select same disk size) or file level (smaller disk size, slower).
Cold cloning: no NT4 FT volumes. **Hot cloning:** no downtime, only volumes that source OS recognizes, only clones bootloaders's default OS. **Importing VMs:** only MBR disks (not GPT). No dynamic RAID volumes, no NT4 FT volumes. Imported VMs must be powered off. Cannot import suspended VMs. Can restore VCB images, but only disks not certain HW backup information.
Remote cloning: source must be accessible on network. **Local:** Converter runs on source machine. Converter Standalone 4.0.1 supports only hot cloning (use Converter 3.0.3 Boot CD for cold clones).
Links: <http://kb.vmware.com/kb/1004588> - Best practices for using and troubleshooting Converter

Backups (VCB & vDR)

Maximums (per vDR appliance): Protected VMs = 100 Concurrent VM backups/restores = 8
Recommended stores = 2 Recommended store size = 1TB
Maximums (per VCB): Concurrently mounted disks = 60
FW Port **Source** **Destination** **Protocol** **Description**
443 (out) VCB proxy Host/vCenter TCP VCB/vcbMounter/backup
22024 vDR plug-in vDR appliance TCP vDR instructions

Both vDR & VCB cannot backup end-user generated snapshots.
VSS (Volume Shadow Copy Service): used by vDR & VCB, produces consistent copies. VMware tools provides: **VSS Requestor** - responds to events from external backup application, controls progress inside guest & interacts with Snapshot Provider. **VSS Snapshot Provider** - registered Windows service, notifies vDR of events during backup. VSS supported on Win 2003 (application consistent) & 2008/Vista (file system consistent). Unsupported Windows OSs, uses VMware Tool's LGTO SYNC driver. Other guest OSs, VMware Tools uses crash-consistent quiescing.
vDR: By default, backup jobs run Mon-Fri night & anytime Sat & Sun. Attempts to backup each VM once a day. CPU usage must be < 90% to start a backup. "Restore rehearsal" tests VM restore. Backup of individual files inside VMs is "experimental". vDR can utilize tape but 3rd party solution needed.
Licensing required: Essential+, Advanced, Enterprise or Enterprise+
Components: • VM appliance • client plug-in. **Default credentials:** `username root password vmw@re`
Default retention policies: **Few:** 7 most recent, 4 weeks, 3 months. **Many:** 7 most recent, 8 weeks, 6 months, 4 quarters, 1 year. **Many:** 15 most recent, 8 weeks, 3 months, 8 quarters, 3 years.
Backups store: any virtual disk supported by ESX plus CIFS. Automatically de-duplicated (cannot be disabled), encrypted & stored as 1GB files in `VMwareDataRecovery` folder. De-dup analyzes VM & breaks it into 2KB to 64KB blocks. To maximize de-dup, back up similar VMs to same store.
VCB: Backup agent not required in each VM. **Win VMs** file-level full & incremental backups. **Non-Win VMs** system & image-level backups. **Backup types:** Image-level entire volume. File-level defined at level of files/folders. **Full-file** all files that comprise VM. **Differential** only files changed since last full backup. **Incremental** only files changed since last full or incremental backup.
VCB proxy: physical or VM with Win 2003 SP1/SP2/R2 or 2008, VCB & 3rd party backup software. File-level & image-level VM backups (not simultaneously!). Disable automatic drive letter assignment to new volumes. Can use SSPI (Security Support Provider Interface) for authentication. Can transfer data over encrypted SSL connection.

Access modes: SAN FC or iSCSI SAN, off-loads backups to physical proxy. **Hot-add** any storage, proxy in a VM. No independent disks. Physical Compatibility RDM or IDE. Needs shadow VM named `"proxy_hostnameVCB-HELPER"`, needs VCB proxy role created. **LAN(NBD)** virtual disks not > 1TB.
VCB workflow: 1) backup software calls pre-backup script, pre-freeze script, quiesces VM, takes snapshot & readies it for 3rd party software (image-level exports snapshot, file-level mounts snapshot), unquiesces, post-thaw script 2) ordinary backup 3) post-backup script, unmounts VM, deletes snapshot.
VCB config file: `C:\Program Files\VMware\VMware Consolidated Backup Framework\config\config.js`
Specify a user name & password for host/vCenter or set password in registry key.
Pre-freeze: `C:\Program Files\VMware\VMware Tools\backupScripts.d` or `/usr/sbin/pre-freeze-script` ascending order with freeze as first argument. **Post-thaw:** `C:\Program Files\VMware\VMware Tools\backupScripts.d` or `/usr/sbin/post-thaw-script` descending order with thaw or freezeFail as first argument
Common VCB commands (run commands without switches to see full syntax required):
Search for a VM: `$ sudo /usr/sbin/vcbVmName -h host -u user -s searchSpec`
Identify folder that stores the VM: `$ sudo /usr/sbin/vcbUtil -c vmfolders`
Mounts/Exports an entire VM: `$ sudo /usr/sbin/vcbMounter -r mount`
Backup a groups of VMs: `$ sudo /usr/sbin/vcbSnapAll`
Backup VM to local/remote server: `$ scp sourcefile user@host:/destination/`
Restore a VM: `$ sudo /usr/sbin/vcbRestore -s directory`
Restore all VMs from vcbSnapAll: `$ sudo /usr/sbin/vcbResAll`
Export single disks: `$ sudo /usr/sbin/vcbExport -s source -d destination`
Create/find/delete quiesced snapshots: `$ sudo /usr/sbin/vcbSnapshot`
VCB Service Console configuration file: `/etc/vmware/backuptools.conf`

Guided Consolidation

Maximums: Analyzed systems = 100
Requirements: • 1.8GB RAM • network access to targets • static IP • correct permissions • Win 2003 SP2, 2008, XP Pro SP3 or Vista (Computer Browser Windows Service enabled), .NET 3.0 SP1
Server & targets: WMI, Remote Registry, File & Printer Sharing services enabled
Targets: can resolve server's name, OS is Win 2000, 2003, 2008, XP or Vista.

FW Port	Source	Destination	Protocol	Description
135 (out)	Consolidation server	DHCP/DNS/WINS	TCP/UDP	DCE locator service
137 (out)	Consolidation server	target machines	TCP/UDP	NetBIOS names
138 (out)	Consolidation server	target machines	TCP/UDP	NetBIOS datagram
139 (out)	Consolidation server	target machines	TCP/UDP	File & Print sharing
445 (out)	Consolidation server	AD DC	TCP/UDP	DNS Direct hosting

Services: **vCenter Collector Service** Discovers domains & systems. Collects performance data.
vCenter Provider Service Communicates with target systems. Passes data to Collector.
vCenter Guided Consolidation Manages communication, saves/analyzes data, makes recommendations.
Process: Find scans Active Domains daily. Recommended no more than 50 active domains.
Analyze returns HW info/usage plus Confidence Metric - ability to gather data & candidate suitability.
Consolidate resized converted disks = (used space x 1.25). VMDKs ≥ 4GB. Can consolidate based on recommendations or manually (requires Converter Enterprise Client). Task created for each conversion





vReference.com

vSphere Supplement

by **Forbes Guthrie** Version 1.x for v4.0 released as beta

CLI & vMA

SW requirements: Install CLI package, or deploy vMA (vSphere Mgmt Assistant). CLI runs on vSphere SDK for Perl on: RHEL 5.2, SLES 10 SP1 32bit, Ubuntu 8.04 32bit, XP SP2, Vista Ent SP1.
Command **ESXi4** **ESX4** **VC4** **CLI** **esxcfg** prefix **Description**
esxcli yes yes **no** Manage PSAs & NMPs.
resxtop yes yes yes Monitors real time ESX resources. Interactive or batch mode. Only on Linux.

svmotion **no** **no** yes Storage VMotion (DMotion)
esxcfg-advcfg yes yes yes esxcfg-advcfg Advanced configuration, e.g. CIM providers.
vicfg-cfgbackup yes **no** **no** esxcfg-cfgbackup Backs-up & restores ESXi configuration.
vicfg-dns yes yes yes esxcfg-dns Sets host's DNS configuration.
vicfg-dumppart yes yes yes esxcfg-dumppart Manages diagnostic partitions.
vicfg-iscsi yes yes yes Manages iSCSI storage.
vicfg-module yes yes yes esxcfg-module Enables VMkernel options.
vicfg-mpath yes yes yes esxcfg-mpath Configures storage arrays.
vicfg-mpath35 **no** **no** **no** Configures storage arrays for 3.5 hosts.
vicfg-nas yes yes yes esxcfg-nas Manages NAS file systems
vicfg-nics yes yes yes esxcfg-nics Manages VMNICs.
vicfg-ntp yes yes yes esxcfg-ntp Specifies NTP server.
vicfg-rescan yes yes yes esxcfg-rescan Rescans storage configuration.
vicfg-route yes yes yes esxcfg-route Manipulates host's route entry
vicfg-scsidevs yes yes yes esxcfg-scsidevs Finds available LUNs.
vicfg-snmpp yes **no** **no** esxcfg-snmpp Manages SNMP agent.
vicfg-syslog yes **no** yes esxcfg-syslog Specifies syslog server & port for ESXi hosts.
vicfg-user yes yes **no** Creates/modifies/deletes/lists local users/groups.
vicfg-vmknict yes yes yes esxcfg-vmknict Adds, deletes, & modifies VMkernel NICs.
vicfg-volume yes yes yes esxcfg-volume Resignatures/mounts/unmounts snapshot volume.
vicfg-vswitch yes yes yes esxcfg-vswitch Add/removes/modifies virtual switches.
vifs yes yes **no** File system ops, e.g. uploading to remote server.
vihostupdate yes yes **no** Manages host updates.
vihostupdate35 **no** **no** **no** Manages 3.5 host updates.
vmkfstools yes yes **no** Creates/manipulates virtual disks, file systems, logical volumes, physical storage devices.

vmware-cmd yes yes yes Remote VM ops, e.g. snapshots, power-on VMs.
If target server is vCenter, can execute most CLI commands against ESX/ESXi systems it manages, using **-vihost** option, without additional authentication. Use CLI commands interactively or in scripts.
vMA:

Links: <http://kb.vmware.com/kb/1008940> - Running CLI 4.0 commands against ESX/ESXi 3.5
http://www.vmware.com/pdf/vsphere4/r40/vsp_40_vcli.pdf - CLI Installation and Reference Guide
<http://communities.vmware.com/docs/DOC-9852> - Community vGhetto Script Repository

Orchestrator

Maximums: vCenters = 10 Hosts = 100 VMs = 3000 Running workflows = 150
FW Port **Source** **Destination** **Protocol** **Description**
25 (out) Orchestrator SMTP server TCP Email notifications
389 (out) Orchestrator LDAP server TCP Directory authentication
443 (out) Orchestrator vCenter TCP Query vCenter
636 (out) Orchestrator LDAP server TCP Secure LDAP lookup
8230 Client Orchestrator TCP Lookups (JNDI port)
8240 Client Orchestrator TCP Commands (RMI port)
8244 Client Orchestrator TCP Data models
8250 Client Orchestrator TCP Messaging
8281 vCenter Orchestrator TCP vCenter API
8282 Client Orchestrator TCP http web UI
8283 Client Orchestrator TCP HTTPS UI (set jetty to SSL)
Possible extras: 1433(MSSQL), 1521(Oracle), 3306(MySQL), 5432(PostgreSQL), 8280/1(internal http/s)

Links: <http://kb.vmware.com/kb/1010956> - Orchestrator log files