

vCenter

Max **Maximums** (per vCenter): Hosts = 1000 VMs = 15000 Running VMs = 10000 Clients = 100
 MAC addresses = 65536 **Maximums** (per datacenter): Hosts = 500
Maximums (Linked mode): vCenters = 10 VMs = 50000 Running VMs = 30000 Hosts = 3000

HW requirements: Min - 2 CPU cores, 4GB RAM • Medium ≤50 hosts/500 VMs - 2 cores, 4GB RAM • Large ≤300 hosts/3000 VMs - 4 cores, 8GB RAM • Extra large ≤1000 hosts/10000 VMs - 8 cores 16GB

SW requirements: • 64bit Windows • 64bit DSN (VUM needs 32bit DSN) • hostname ≤15 characters.

Databases: • SQL 2008 Express (≤5 hosts/50 VMs) • SQL 2005 SP3 • SQL 2008 SP1 or R2 • Oracle 10g R2 or 11g R1 • IBM DB2 9.5 fix pack 5 or 9.7 fix pack 2. VUM only supports Oracle & MS SQL. User needs DBO rights. Default of max 50 simultaneous DB connections. MS SQL don't use master DB.

vCenter Virtual Appliance (VCVA): Supported DBs • embedded (< 100 hosts & 1000 VMs) • Oracle. **RAM sizing:** ≥4GB for <100 hosts/100 VMs, ≥8GB for 10-100 hosts/100-1000 VMs, ≥13GB for 100-400 hosts/1000-4000 VMs, ≥17GB for >400 host/4000 VMs. **Limits:** no IPv6, Linked Mode, MS SQL, DB2.

Additional tools on vCenter DVD: • vSphere Update Manager (VUM) • syslog server • ESXi Dump collector (doesn't support vDS) - collects PSOD info • Authentication Proxy (see below) • Pre-Upgrade checker - checks for potential host issues • Auto Deploy server (see ESXi section) • Web Client server (see below)

FW Port	Source	Destination	Protocol	Description
80	Clients	vCenter	TCP	Redirect to HTTPS
389	vCenter	Other vCenters	TCP	Linked Mode LDAP
443	Clients	vCenter	TCP	vSphere Client access
443	vCenter	ESXi	TCP	vCenter agent
902	ESXi	vCenter	UDP	Heartbeat
902	vCenter	ESXi	UDP	Host management, heartbeat
903	ESXi, Clients	vCenter	TCP	VM Console

Possible extras: 25(SMTP),53(DNS),80/443/623(DPM),88(AD),161/162(SNMP),636(Linked vCenters), 1433(MSSQL),1521(Oracle),5988/5989(CIM),6500/8000(Dump Collector),8000(vMotion),8080/8443 (webservices),9443 (Web Client),10443(Inventory service),51915 (Authentication proxy)

Logs: DB upgrade: %TEMP%\VCDatabaseUpgrade.log vCenter agent: /var/log/vmware/vpx/vpxa.log
 vCenter install: %TEMP%\directory of installing user> vCenter logs: %TEMP%\vpx\vpxd-#.log
 Windows Client install %TEMP%\vmmis.log
 Windows Client Service %USERPROFILE%\Local Settings\Application Data\vpx\viclient-x.log (x=0-9)
 Guest customization: %WINDIR%\temp\vmware-icm Linux /var/log/vmware/icm/toolsDeployPkg.log

Default roles (System roles - permanent, cannot edit privileges, ESXi & vCenter. Sample just vCenter):
 No access System - Default except users in Admin Group. Cannot view or change
 Read only System - View state & details except console tab
 Administrator System - All privileges. Default for members of the Admin Group, & AD ESX Admins
 VM power user Sample - Interact with, change VM HW settings, snapshots & schedule tasks
 VM user Sample - Interact with, insert media & power ops. Cannot change VM HW settings
 Resource pool admin Sample - Create, modify child pools & assign VMs, but not RP itself
 Datastore consumer Sample - Allows space consumption of the datastore
 Network consumer Sample - Allows hosts or VMs to be assigned to network

Permissions: pair user/group with role & associate with object. **Role** - predefined set of privileges. Users initially granted **No Access** role on new objects including datastores/networks. Logged in users removed from domain keep permissions until next validation period (default 24 hrs). **Tasks** - activities that don't complete immediately. All roles allow schedule tasks by default. Can schedule tasks if user has permission when task created. vCenter Local Admins have Administrator role by default. Propagation is per permission, not universal. Child permissions override those propagated. User permissions override Group ones. Set vDS permissions on parent & propagate. Use **No Access** role to mask areas from users. Moving objects requires permission on object, source & destination parent.

Licensing:	Essential	Essential+	Standard	Enterprise	Enterprise+
vRAM (per socket license)	32GB	32GB	64GB	96GB	96GB
vCPU	8 way	8 way	8 way	32 way	32 way

vpix, Thin pro, VUM, VADP Yes Yes Yes Yes Yes
 vMotion, HA, vDR Yes Yes Yes Yes Yes
 DRS, DPM, Storage vMotion, FT, VAAI, Hot add, Linked mode, Orchestrator, vShield zones, Serial port concentrator | > Yes Yes
 DVS, NIOC, SIOC, Host Profiles, Auto Deploy, Storage Polices, Storage DRS, 3rd party MPP Yes
 vRAM - Memory configured on hosts' powered-on VMs. Consumed vRAM capped at 96GB per VM. Only Essential(+) has hard vRAM limit. CPU licenses from same license level are pooled across linked mode vCenters. Keys in vCenter not deployed add to entitlement. Add vRAM by adding licenses or upgrading existing. Consumed vRAM is 12 month average. Can create reports & alerts for consumed/entitled vRAM. Key assigned to host via vCenter is persistent.

vSphere Hypervisor - free, no connection to vCenter, ≤32GB vRAM, only servers ≤32GB physical RAM
vSphere Desktop - for VDI, functionality of Enterprise+ & unlimited vRAM. Per powered-on desktops. Expiring licenses: vCenter - hosts are disconnected. ESXi - VMs run, but cannot power-on/reset.

Statistics: CPU, memory, disk, network, system & VM ops. **Collection Intervals** (time period stats archived in DB) frequency/retention is 5 mins - 1 day, 30 mins - 1 week, 2 hrs - 1 month, 1 day - 1 year. **Real-time stats** (just performance charts) flat file on hosts & vCenter memory (not in DB), frequency/retention is 20 secs - 30 mins, only powered-on hosts & VMs. **Collection level** 1-4 for each interval, most counters is 4 (default 1). **Datastore metrics** only in overview charts (not advanced charts). **Reports & Maps** updated every 30 mins. VMware Tools adds Windows perfmon objects.

Alarms: notifications of selected events, conditions & states. Composed of Trigger & Action. **Triggers:** condition/state triggers (monitor VMs, hosts & datastores - equal to/not equal to & above/below) & event triggers (any object, vCenter or license server - arguments, operators & values). **Actions:** responses to triggered alarms. Default alarms don't have actions associated. Can disable action without disabling alarm, but effects actions on all alarms. Disable for selected object, child continues. Acknowledging alarm stops action, but alarm still visible. Reduce alarms with tolerance range & trigger frequency (default 5 mins). Disconnect hosts to suspend monitoring.

Linked mode: joins VCs. Global data: IP & ports, certificates, licensing, user roles. Uses ADAM (AD App Mode) to store & sync data. Instances can run under different domain accounts. Installed by domain user who is admin on both machines. Requirements: DNS, 2-way trust if different domains, time sync, DNS name matches hostname. Roles are replicated, assignments of roles are not. Server settings: licensing (vCenter & 3.x), statistics (intervals & DB size), runtime settings (unique ID, managed IP, name), AD (timeouts, query limit, validation period), mail, SNMP receivers, http(s) ports, client timeouts, logging detail, DB connections, DB retention, SSL host verification, advanced settings.

Host Profiles: Policy to centrally configure & check compliance of hosts. Set at host or cluster level. Reference host - host which created the profile. Exported profile format .vpf When profile is detached, settings persist on host/cluster. AutoDeploy **Answer File** contains the user input required. Host must be in Maintenance Mode to apply profile, AutoDeploy hosts needs reboot.

Authentication Proxy: No AD credentials on ESXi, just domain name & proxy IP. Installer creates AD account prefixed CAM. Authenticate proxy to ESXi by importing SSL cert, or push via Host Profiles.

Web Client server: Alternative to Windows Client. Cross-platform & cross-browser (Adobe Flex plugin). Connects to vCenter (not to hosts directly), register Client server first. Subset of Windows Client functionality - Monitoring & VM deployment, no host/cluster/datastore/network configuration Admin tool <https://localhost-9443/admin-app> Web client <https://<server-name>-9443/vsphere-client>

Guest Customization: Guest OS must be on SCSI node 0:0. Requires Perl in Linux guests. Windows guest Admin password must be blank for customization to change it.

vService: Service dependency for vApps or VMs. vService Manager monitors health: • Red - issue needs fixed in solution (the extension) • Yellow - vService Manager is repairing • Green - OK

Links: Resolution Path Troubleshooting Licensing <http://communities.vmware.com/docs/DOC-16082>
 Collecting diagnostic information for vCenter <http://kb.vmware.com/kb/1011641>
 Installing vCenter Server 5.0 best practices <http://kb.vmware.com/kb/2003790>
 Upgrading to vCenter Server 5.0 best practices <http://kb.vmware.com/kb/2003866>
 Sysprep file locations and versions <http://kb.vmware.com/kb/1005593>
 Firewall Ports <http://kb.vmware.com/kb/1012382>
 vCenter client shortcuts <http://www.jume.nl/articles/vmware/143-vcenter-client-shortcuts>
 vSphere 5 Licensing, Pricing and Packaging http://www.vmware.com/files/pdf/vsphere_pricing.pdf