

# VCP510 (VCP on vSphere 5) Exam Cram Notes Part 1/3

## Sub-sections

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## **1: Auto Deploy**

vSphere Auto Deploy **installs the ESXi** image directly **into Host memory**.

By default, hosts deployed with VMware Auto Deploy **store logs in memory**.

When deploying hosts with VMware Auto Deploy, **Host Profiles** is the recommended method to configure ESXi once it has been installed.

**Benefits** of auto deploy = **decouples** the VMware ESXi host from the physical server and **eliminates the boot disk, eliminates configuration drift, simplifies patching** and updating.

VMware Auto Deploy Installation = the quickest possible way to deploy > 10 ESXi hosts.

Interactive Installation = recommended install method to evaluate vSphere 5 on a small ESXi host setup.

The vSphere **power CLI image builder cmdlet** defines the image profiles used with auto deploy.

3 ways that vSphere Auto Deploy can access the answer file: 1) CIFS 2) SFTP 3) HTTP

*Note: 6 ways ESXi Scripted installations and upgrades can access installation or upgrade script (kickstart file): 1) CD/DVD 2) USB Flash Drive 3) NFS 4) HTTP 5) HTTPS 6) FTP*

## **2: HA**

In a HA cluster after an initial election process, host is either **Master** or **Slave**.

**vCenter may communicate to the Slaves** in certain situations, such as:

- i) **Scanning for an existing Master**.
- ii) If the **Master states that it cannot reach a Slave**, vCenter will contract the Slave to determine why.
- iii) When **powering on a FT Secondary VM**.
- iv) When **host** is reported **isolated** or **partitioned**.

A HA Slot = a logical representation of the memory and CPU resources that satisfy the requirements for any powered-on virtual machine in the cluster.

The 4 **VM Restart Priority** options available on a HA cluster = **Disabled, Low, Medium, High.**

The three **Host Isolation Response** options available on a HA Cluster = **Shut down, Power off, Leave powered on.**

If the '**Admission Control**' option '**Disable: Allow VM power on operations that violate availability constraints**' is selected, then "if a cluster has **insufficient failover capacity**, **vSphere HA** can still perform failovers and it **uses the VM Restart Priority** setting to determine which virtual machines to power on first."

### **3a: Licensing**

VMware vSphere can be **evaluated** for **60 days** prior to purchase

**Free vSphere** Hypervisor is allowed **32GB** Physical RAM per **host**

If more vRAM is allocated than licensed for, new VM's cannot be powered on

### **3b: Licensing - Entitlements per CPU license**

**32GB** vRAM, **8-way** vCPU for **Essentials, Essentials Plus, Standard**

**64GB** vRAM, **8-way** vCPU for **Enterprise**

**96GB** vRAM, **32-way** vCPU for **Enterprise Plus**

### **3c: Licensing - Features**

Essentials Plus: **High Availability, Data Recovery, vMotion**

Standard: *as above*

Enterprise: + **Virtual Serial Port Concentrator, Hot Add, vShield Zones, Fault Tolerance, Storage APIs for Array Integration, Storage vMotion, Distributed Resource Scheduler & Distributed Power Management**

Enterprise Plus: + **Distributed Switch, I/O Controls (Network and Storage), Host Profiles, Auto deploy, Profile-Driven Storage, Storage DRS**

## **4: Memory**

**VMX Swap** can be used to reduce virtual machine memory overhead.

**Memory allocation – memory limit** = amount of virtual machine memory that will always be composed of disk pages.

(v)NUMA = (virtual) Non-Uniform Memory Access (a computer memory design used in multiprocessors where the memory access time depends on the memory location relative to a processor.)

**vNUMA** is **enabled** by **default** when a virtual machine has **more than 8 vCPU's**.

Disabling transparent memory page sharing increases resource contention.

For maximum performance benefits of vNUMA, recommend make sure your clusters are composed entirely of hosts with matching NUMA architecture.

**Memory reservation** = the amount of physical memory that is guaranteed to the VM.

**Resource Allocation tab** definitions: **Host memory** usage = amount of **physical host memory** allocated to a guest (includes virtualisation **overhead**.)

**Resource Allocation tab** definitions: **Guest memory** usage = amount of **memory actively used by a guest** operating system and it's **applications**.

3 metrics to diagnose a memory bottleneck at the ESXi host level: **MEMCTL, SWAP, ZIP**.

Virtual Machine **Memory Overhead** is determined by **Configured Memory** and Number of **vCPUs**.

## **5: Miscellaneous**

**New features** made available with vSphere 5 = **sDRS, VSA, vSphere Web Client, SplitRX...**  
ESXi is no longer available with vSphere 5

Via the **Direct Console**, it is possible to: (F12) **Shut down/Restart host**, (F2) **Customize System/View Logs** - which includes: **Configure/Restart/Test Management Network** (includes **configure host IP, DNS**), **View System Logs**, **Troubleshooting Mode Options** > **Restart Management Agents**.

Via the Direct Console, it is NOT possible to: Enter host into Maintenance Mode

**vMotion** has been **improved** by **allowing multiple vMotion vmknics**, allowing for more and faster vMotion operations

**Image Builder** is used to create ESXi installation images with a customized set of updates, patches, and drivers

Packaging format used by the VMware ESXi Image Builder = **VIB**

By **default**, the **Administrator role** at the ESX **Host** Server level is assigned to **root** and **vpuser**

Distributed Power Management (**DPM**) requires Wake On LAN (**WOL**) technology on host NIC  
ESXi 5.0 **supports only LAHF and SAHF** CPU instructions

The three **default roles** provided on an **ESXi host** = **No Access, Read Only, Administrator**  
**ESXi Dump Collector** is a new feature of vSphere 5

Automation Levels on a **DRS Cluster** = **Manual, Partially Automated, Fully Automated**  
ESXi 5.0 introduces **Virtual Hardware VM Version 8**

To disable alarm actions for a DRS cluster while maintenance is taking place: Right-Click the DRS cluster, select Alarm → 'Disable Alarm Actions.'

3 valid objects to place in a **vApp** → **Resource pools, vApps, Virtual Machines**.

Required settings for a **kick start ESXi host upgrade script file**: root password & IP address.

**vMotion** cannot be used unless **RDM boot mapping files** are placed on the same datastore & **storage vMotion** cannot be used with RDMs using **NPIV**.

Conditions that would stop virtual machines restarting in the event of a host failure in a HA cluster: 1) An anti-affinity rule configured where restarting the VMs would place them on the same host. 2) The virtual machines on the failed host are HA disabled.

The VMkernel is secured by the features – **memory hardening** and **kernel module integrity**.

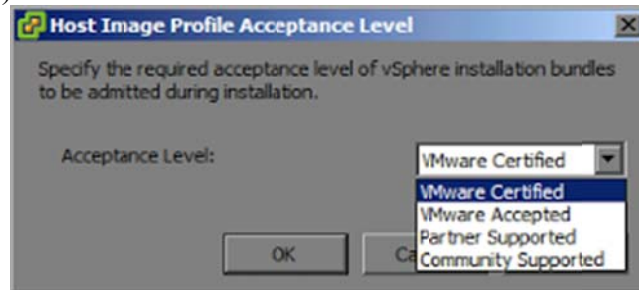
**VMware vCloud Director** pools virtual infrastructure resources in datacenters and delivers them to users as a catalog-based service.

Two ways **to enable remote tech support mode** (SSH) on an ESXi 5.x host: 1) Through the Security Profile pane of the Configuration tab in the vSphere Client. 2) Through the Direct Console User interface (DCUI.)

**%RDY** metric is checked to determine if CPU contention exists on an ESXi 5.x host (*Note: %RDY = Percentage of time the resource pool, virtual machine, or world was ready to run, but was not provided CPU resources on which to execute.*)

**Quiescing virtual machine snapshot** operation: 1) Requires **VMware tools**. 2) Ensures that the snapshot includes a **power state**. 3) May **alter the behaviour** of applications within the virtual machine. 4) Ensures all pending disk I/O **operations are written to disk**.

**Image Profile Acceptance Levels:** Community Supported < Partner Supported < VMware Accepted < VMware Certified (where VMware Certified Acceptance Level has the most stringent requirements.)



Each **VMware Data Recovery** appliance can have **no more than two dedupe destinations**, and it is **recommended** that each dedupe destination is **no more than 1TB in size when using virtual disks**, and no more than **500GB in size when using a CIFS network share**.

### **6a: Networking - General**

ESX 4.X to ESXi 5.0 upgrade **removes the "Service Console" port group** because ESXi 5.0 has no Service Console.

**SplitRX** can be used to increase network throughput to virtual machines.

The default security policy on a Port Group = **Reject, Accept, Accept** (Promiscuous Mode, MAC Address Changes, Forged Transmits.)

ESX 4.X to ESXi 5.0 upgrade process **migrates all vswif interfaces to vmk** interfaces.

**SSH configuration** is **not migrated** for ESX 4.x hosts or ESXi 4.0 hosts (SSH access is disabled during the migration or upgrade process.)

**Custom ports** that were opened by using the ESX/ESXi 4.1 esxcfg-firewall command do not remain open after upgrade to ESXi 5.0.

A **firewall** has been **added** to ESXi 5.0 to improve security.

vSphere Standard Switch **Traffic shaping settings**: **Status** – Disabled/Enabled, **Average Bandwidth (Kbit/sec)**, **Peak Bandwidth (Kbit/sec)**, **Burst Size (Kbytes)**.

To relieve a network bottleneck caused by a VM with occasional high outbound network activity, apply traffic shaping to the port group that contains the virtual machine.

NIC Teaming policy: **Notify Switches** → the physical switch is notified when the location of a virtual NIC changes.

A remote SSH connection to a newly installed ESXi 5.x host fails, possible causes: 1) The **SSH service is disabled** on the host by **default**. 2) The **ESXi firewall blocks the SSH** protocol by **default**.

**Forged transmits**: allows packets to be created by a virtual machine with different source MAC address.

To verify all IP storage VMkernel interfaces are configured for jumbo frames, either: 1) **esxcli network IP interface list**. 2) View the VMkernel interface properties in the vSphere client.

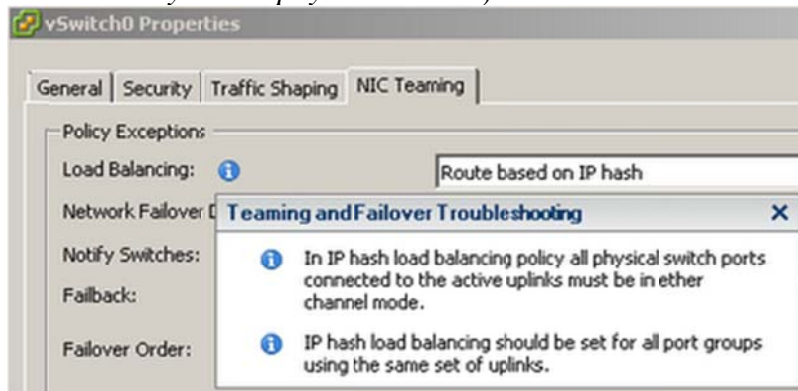
Map view indicates vMotion is disabled => vMotion has not been enabled on a VMkernel port group.

ESXi Host → Configuration Tab → Network Adapters : Headings = Device, **Speed**, Configured, Switch, MAC Address, **Observed IP Ranges**, **Wake on LAN Supported**.

If you create a portgroup and assign it to **VLAN 4095**, it will have access to all the VLANs that are exposed to the physical NIC (a special driver is needed within the VM that can properly tag VLANs.)

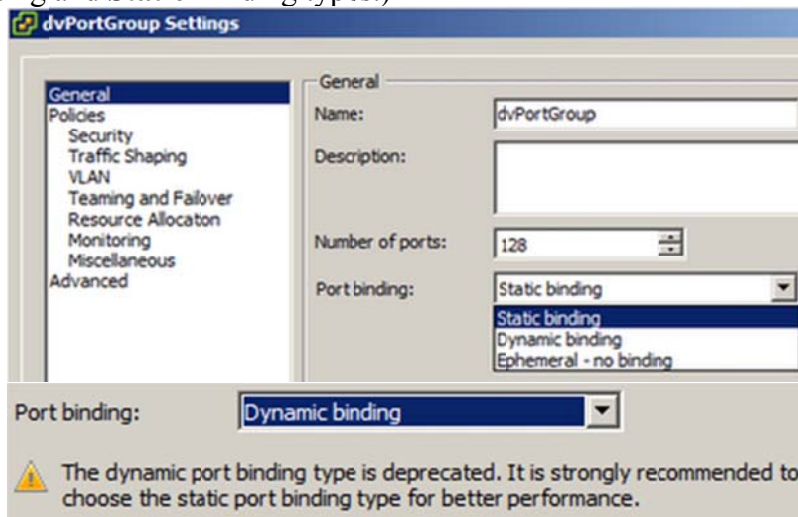
By default, new adapters are active for all policies, and new adapters carry traffic for the standard switch and its port group unless you specify otherwise.

In **IP hash load balancing policy** all **physical switch ports** connected to the active uplinks **must** be in **ether channel mode** (Note: if the physical switch ports are **not in ether channel mode**, new uplinks will be considered active/active but **will not participate** in the active NIC team until configured correctly on the physical switch.)



## 6b: Networking - vSphere Distributed Switch

The **Dynamic Binding** dvPort binding type has been **deprecated** in vSphere 5 (leaving **Ephemeral Binding** and **Static Binding** types.)



**Network Load Balancing policies** for vSphere Distributed Switch = Route based on **originating virtual port**; Route based on **IP hash**; Route based on **source MAC hash**; Route based on **physical NIC load**; Use **explicit failover** order.

Requirements for a collector virtual machine to **analyze traffic** from a vSphere Distributed Switch: 1) The source and target virtual machines must both be on a vNetwork Switch, but can be on any vDS datacenter. 2) The port group on distributed port must have **NetFlow** enabled.

Two methods to **migrate** a virtual machine from a vSphere Standard Switch (VSS) to a vSphere Distributed Switch (VDS): **1) Migrate** the port group containing the virtual machine from a vNetwork Standard Switch using the Migrate Virtual machine networking option. **2) Edit** the Network Adapter settings for the virtual machine and select a dvPort group from the list.

**3 features** only available when using a **vSphere Distributed Switch**: 1) **NetFlow** monitoring. 2) Network **I/O control**. 3) **Egress and ingress** traffic shaping.

New feature: vSphere Distributed Switch - improves visibility of virtual-machine traffic through

NetFlow and enhances monitoring and troubleshooting through **Switched Port Analyzer (SPAN)** and **Link Layer Discovery Protocol (LLDP)** support.

### **6c: Networking - Ports**

**22: SSH** operates on port 22

**80: vCenter Server** requires port 80 for **direct HTTP connections**. Port 80 redirects requests to HTTPS port 443

**389:** This port must be open on the local and all remote instances of vCenter Server. This is the **LDAP** port number for the Directory Services for the vCenter Server group. The vCenter Server system needs to bind to port 389, even if you are not joining this vCenter Server instance to a Linked Mode group.

**443:** The default port that the vCenter Server system uses to listen for connections from the **vSphere Client**. The vCenter Server system also uses port 443 to monitor **data transfer from SDK clients**.

**636:** For **vCenter Server Linked Mode**, this is the SSL port of the local instance.

**902:** The default port that the vCenter Server system uses to **send data** to managed hosts. Managed hosts also send a regular **heartbeat** over UDP port 902 to the vCenter Server system. This port **must NOT be blocked** by firewalls between the **server and the hosts** or **between hosts**. Also must NOT be blocked between the **vSphere Client and the hosts**. The vSphere Client uses this port to **display virtual machine consoles**.

**8080: Web Services HTTP.** Used for the VMware VirtualCenter Management Web Services.

**8182: vSphere HA** uses TCP and UDP port 8182 for agent-to-agent communication.

**8443: Web Services HTTPS.** Used for the VMware VirtualCenter Management Web Services.

**10109: vCenter Inventory Service Service Management**

**10111: vCenter Inventory Service Linked Mode Communication**

**10443: vCenter Inventory Service HTTPS**

**60099: Web Service change service notification port**

### **7: Storage**

vStorage Thin Provisioning feature provides **dynamic allocation of storage capacity**

**Upgrade** from VMFS-3 to **VMFS-5** requires **no downtime**

VMFS-5 is introduced by vSphere 5

The globally unique identifier assigned to each Fibre Channel Port = **World Wide Name (WWN)**

**NFS** protocol is used by an ESXi host to communicate with **NAS** devices

It is now possible in vSphere 5 to **Storage vMotion virtual machines that have snapshots**

Two **iSCSI discovery** methods supported by an ESXi host = **Static Discovery**, and **Send Targets**

**VMFS-5 upgraded** from VMFS-3 continues to **use the previous file block size** which may be larger than the unified 1MB file block size

Shared local storage is not a supported location for a host diagnostic partition

The **VMware HCL** lists the **correct MPP** (Multi-Pathing Protocol) to use with a storage array

To guarantee a certain level of capacity, performance, availability, and redundancy for a virtual machines storage use the **Profile-Driven Storage** feature of vSphere 5

Use **sDRS** (storage DRS) to ensure **storage is utilized evenly**

If an ESXi 5.x host is configured to boot from Software iSCSI adapter and the administrator disables the iSCSI Software adapter, then it will be disabled but is re-enabled the next time the host boots up.

An array that supports vStorage APIs for array integration (**VAAI**) can directly perform → **Cloning** virtual machines and templates; Migrating virtual machines using **Storage vMotion**. **VAAI thin provisioning dead space reclamation** feature can reclaim blocks on a thin provisioned LUN array: 1) When a virtual machine is migrated to a different datastore. 2) When a virtual disk is deleted.

**Manage Paths** → can disable path by right-clicking and selecting disable.

A **preferred path selection** can only be made with **Fixed 'Path Selection' types** (not possible with 'Round Robin' or 'Most Recently Used' types.)

Information about a VMFS datastore available via the **Storage Views** tab includes →

**Multipathing** Status, **Space Used**, **Snapshot Space**.

Two **benefits of virtual compatibility mode RDMs** v physical compatibility mode RDMs: 1) Allows for cloning. 2) Allows for template creation of the related virtual machine.

To **uplink a Hardware FCoE Adapter**, create a vSphere Standard Switch and add the FCoE Adapter as an uplink.

**Three storage I/O control conditions** that might trigger the **non-VI workload detected** on the datastore alarm: 1) The datastore is Storage I/O Control-enabled, but it cannot be fully controlled by Storage I/O Control because of an external workload. This can occur if the Storage I/O Control-enabled datastore is connected to an **ESX/ESXi host that does not support Storage I/O Control**. 2) The datastore is Storage I/O Control-enabled and **one or more of the hosts** to which the datastore connects is **not managed by vCenter Server**. 3) The **array is shared with non-vSphere workloads** or the array is performing system tasks such as **replication**.

The **software iSCSI Adapter** and **Dependent Hardware iSCSI Adapter** require one or more **VMkernel** ports.

**Unplanned Device Loss** in a vSphere 5 environment = A condition where an ESXi host determines a device loss has occurred that was not planned. Performing a storage rescan removes the persistent information related to the device.

To convert **thin** provisioned disk to **thick** either use the **inflate option** in the Datastore Browser or use **Storage vMotion** and change the disk type to Thick.

To manage storage placement by using virtual machine profiles with a storage array that supports vSphere Storage APIs (Storage Awareness):

- 1 **Create user-defined** storage capabilities.
- 2 **Associate user-defined** storage capabilities with **datastores**.
- 3 **Enable virtual machine** storage **profiles** for a host or cluster.
- 4 **Create virtual machine** storage **profiles** by defining the storage capabilities that an application running on a virtual machine requires.
- 5 **Associate** a virtual machine storage profile with the virtual machine files or virtual disks.
- 6 **Verify** that virtual machines and virtual disks use datastores that are compliant with their associated virtual machine storage profile

## **8: Update Manager**

Default **Hosts upgrade baselines** included with vSphere Update Manager: **Critical Host Patches**, **Non-Critical Host Patches**.

Default **VMs/VAs upgrade baselines** included with vSphere Update Manager: VMware **Tools Upgrade to Match Host**, **VM Hardware Upgrade to Match Host**, **VA Upgrade to Latest**. vSphere 5 vCenter Update Manager cannot update virtual machine hardware when running against legacy hosts.

Update Manager can update virtual appliances but cannot update the vCenter Server Appliance.

### **9a: vCenter**

vCenter Server 5 requires a **64 Bit DSN**.

vCenter **Heartbeat** product provides **high availability** for vCenter server.

vCenter requires a **valid** (internal) domain name system (**DNS**) **registration**.

vCenter **4.1** and vCenter **5.0 cannot be joined** with Linked-Mode.

The VMware vSphere Storage Appliance manager (**VSA manager**) is installed on the vSphere 5 vCenter Server System.

**Optional components** that can be installed from the VMware vSphere 5.0 vCenter Installer: **Product Installers**) vSphere Client, VMware vSphere Web Client (Server), VMware vSphere Update Manager. **Support tools**) VMware ESXi Dump Collector, VMware Syslog Collector, VMware Auto Deploy, VMware vSphere Authentication Proxy. **Utility**) vCenter Host Agent Pre-Upgrade Checker.

Predefined vCenter Server roles are: **No access**, **Read-only**, **Administrator** (there are also 6 sample roles.)

To **export ESXi 5.x host diagnostic information / logs** from a host managed by a vCenter server instance using the vSphere Client: **1)** Home → Administration → System Logs → Export System Logs → Source: select the ESXi host → Select System Logs: Select all → Select a Download Location → Finish. **2)** Under 'Hosts and Clusters' view select the ESXi host → File → Export → Export System Logs → Select System Logs: Select all → Select a Download Location → Finish.

### **9b: vCenter Server Sizing**

Medium deployment of up to **50 hosts** and 500 powered-on VMs: **2** cores, **4GB** RAM, 5GB disk  
Large deployment of up to **300 hosts** and 3000 powered-on VMs: **4** cores, **8GB** RAM, 10GB disk

Extra-Large deployment of up to **1000 hosts** and 10'000 powered-on VMs: **8** cores, **16GB** RAM, 10GB disk



## **VCP510 (VCP on vSphere 5) Exam Cram Notes Part 2/3: vSphere 5 Configuration Maximums**

### Sub-sections:

- 1: *vSphere 5 Compute Configuration Maximums*
- 2: *vSphere 5 Memory Configuration Maximums*
- 3: *vSphere 5 Networking Configuration Maximums*
- 4: *vSphere 5 Orchestrator Configuration Maximums*
- 5: *vSphere 5 Storage Configuration Maximums*
- 6: *vSphere 5 Update Manager Configuration Maximums*
- 7: *vSphere 5 vCenter Server, and Cluster and Resource Pool Configuration Maximums*
- 8: *vSphere 5 Virtual Machine Configuration Maximums*

### **1: vSphere 5 Compute Configuration Maximums**

- 1 = Maximum amount of virtual CPU's per Fault Tolerance protected virtual machine
- 4 = Maximum Fault Tolerance protected virtual machines per ESXi host
- 16 = Maximum amount of virtual disks per Fault Tolerance protected virtual machine
- 25 = Maximum virtual CPU's per core
- 160 = Maximum logical CPU's per host
- 512 = Maximum virtual machines per host
- 2048 = Maximum virtual CPU's per host
- 64GB = Maximum amount of RAM per Fault Tolerance protected virtual machine

### **2: vSphere 5 Memory Configuration Maximums**

- 1 = Maximum number of swap files per virtual machine
- 1TB = Maximum swap file size
- 2TB = Maximum RAM per host

### **3: vSphere 5 Networking Configuration Maximums**

- 2 = Maximum forcedeth 1Gb Ethernet ports (NVIDIA) per host
- 4 = Maximum concurrent vMotion operations per host (1Gb/s network)
- 8 = Maximum concurrent vMotion operations per host (10Gb/s network)
- 8 = Maximum VMDirectPath PCI/PCIe devices per host
- 8 = Maximum nx\_nic 10Gb Ethernet ports (NetXen) per host
- 8 = Maximum ixgbe 10Gb Ethernet ports (Intel) per host
- 8 = Maximum be2net 10Gb Ethernet ports (Emulex) per host
- 8 = Maximum bnx2x 10Gb Ethernet ports (Broadcom) per host
- 16 = Maximum bnx2 1Gb Ethernet ports (Broadcom) per host
- 16 = Maximum igb 1Gb Ethernet ports (Intel) per host
- 24 = Maximum e1000e 1Gb Ethernet ports (Intel PCI-e) per host
- 32 = Maximum tg3 1Gb Ethernet ports (Broadcom) per host
- 32 = Maximum e1000 1Gb Ethernet ports (Intel PCI-x) per host
- 32 = Maximum distributed switches (VDS) per vCenter
- 256 = Maximum Port Groups per Standard Switch (VSS)
- 256 = Maximum ephemeral port groups per vCenter
- 350 = Maximum hosts per VDS

1016 = Maximum active ports per host (VSS and VDS ports)  
4088 = Maximum virtual network switch creation ports per standard switch (VSS)  
4096 = Maximum total virtual network switch ports per host (VSS and VDS ports)  
5000 = Maximum static port groups per vCenter  
30000 = Maximum distributed virtual network switch ports per vCenter  
6x10Gb + 4x1Gb = Maximum combination of 10Gb and 1Gb Ethernet ports per host

#### **4: vSphere 5 Orchestrator Configuration Maximums**

10 = Maximum vCenter server systems connect to vCenter Orchestrator  
100 = Maximum hosts connect to vCenter Orchestrator  
150 = Maximum concurrent running workflows  
15000 = Maximum virtual machines connect to vCenter Orchestrator

#### **5: vSphere 5 Storage Configuration Maximums**

2 = Maximum concurrent Storage vMotion operations per host  
4 = Maximum Qlogic 1Gb iSCSI HBA initiator ports per server  
4 = Maximum Broadcom 1Gb iSCSI HBA initiator ports per server  
4 = Maximum Broadcom 10Gb iSCSI HBA initiator ports per server  
4 = Maximum software FCoE adapters  
8 = Maximum non-vMotion provisioning operations per host  
8 = Maximum concurrent Storage vMotion operations per datastore  
8 = Maximum number of paths to a LUN (software iSCSI and hardware iSCSI)  
8 = Maximum NICs that can be associated or port bound with the software iSCSI stack per server  
8 = Maximum number of FC HBA's of any type  
10 = Maximum VASA (vSphere storage APIs – Storage Awareness) storage providers  
16 = Maximum FC HBA ports  
32 = Maximum number of paths to a FC LUN  
32 = Maximum datastores per datastore cluster  
62 = Maximum Qlogic iSCSI: static targets per adapter port  
64 = Maximum Qlogic iSCSI: dynamic targets per adapter port  
64 = Maximum hosts per VMFS volume  
64 = Maximum Broadcom 10Gb iSCSI dynamic targets per adapter port  
128 = Maximum Broadcom 10Gb iSCSI static targets per adapter port  
128 = Maximum concurrent vMotion operations per datastore  
255 = Maximum FC LUN Ids  
256 = Maximum VMFS volumes per host  
256 = Maximum datastores per vCenter  
256 = Maximum targets per FC HBA  
256 = Maximum iSCSI LUNs per host  
256 = Maximum FC LUNs per host  
256 = Maximum NFS mounts per host  
256 = Maximum software iSCSI targets  
1024 = Maximum number of total iSCSI paths on a server  
1024 = Maximum number of total FC paths on a server  
2048 = Maximum Powered-On virtual machines per VMFS volume

2048 = Maximum virtual disks per host  
9000 = Maximum virtual disks per datastore cluster  
30'720 = Maximum files per VMFS-3 volume  
130'690 = Maximum files per VMFS-5 volume  
1MB = Maximum VMFS-5 block size (non upgraded VMFS-3 volume)  
8MB = Maximum VMFS-3 block size  
256GB = Maximum file size (1MB VMFS-3 block size)  
512GB = Maximum file size (2MB VMFS-3 block size)  
1TB = Maximum file (4MB VMFS-3 block size)  
2TB – 512 bytes = Maximum file size (8MB VMFS-3 block size)  
2TB – 512 bytes = Maximum VMFS-3 RDM size  
2TB – 512 bytes = Maximum VMFS-5 RDM size (virtual compatibility)  
64TB = Maximum VMFS-3 volume size  
64TB = Maximum FC LUN size  
64TB = Maximum VMFS-5 RDM size (physical compatibility)  
64TB = Maximum VMFS-5 volume size

#### **6: vSphere 5 Update Manager Configuration Maximums**

1 = Maximum ESXi host upgrades per cluster  
24 = Maximum VMware tools upgrades per ESXi host  
24 = Maximum virtual machines hardware upgrades per host  
70 = Maximum VUM Cisco VDS updates and deployments  
71 = Maximum ESXi host remediations per VUM server  
71 = Maximum ESXi host upgrades per VUM server  
75 = Maximum virtual machines hardware scans per VUM server  
75 = Maximum virtual machine hardware upgrades per VUM server  
75 = Maximum VMware Tools scans per VUM server  
75 = Maximum VMware Tools upgrades per VUM server  
75 = Maximum ESXi host scans per VUM server  
90 = Maximum VMware Tools scans per ESXi host  
90 = Maximum virtual machines hardware scans per host  
1000 = Maximum VUM host scans in a single vCenter server  
10000 = Maximum VUM virtual machines scans in a single vCenter server

#### **7: vSphere 5 vCenter Server, and Cluster and Resource Pool Configuration Maximums**

100% = Maximum failover as percentage of cluster  
8 = Maximum resource pool tree depth  
32 = Maximum concurrent host HA failover  
32 = Maximum hosts per cluster  
512 = Maximum virtual machines per host  
1024 = Maximum children per resource pool  
1600 = Maximum resource pool per host  
1600 = Maximum resource pool per cluster  
3000 = Maximum virtual machines per cluster

#### **8: vSphere 5 Virtual Machine Configuration Maximums**

1 = Maximum IDE controllers per virtual machine  
1 = Maximum USB 3.0 devices per virtual machine  
1 = Maximum USB controllers per virtual machine  
1 = Maximum Floppy controllers per virtual machine  
2 = Maximum Floppy devices per virtual machine  
3 = Maximum Parallel ports per virtual machine  
4 = Maximum IDE devices per virtual machine  
4 = Maximum Virtual SCSI adapters per virtual machine  
4 = Maximum Serial ports per virtual machine  
4 = Maximum VMDirectPath PCI/PCIe devices per virtual machine (or 6 if 2 of them are Teradici devices)  
10 = Maximum Virtual NICs per virtual machine  
15 = Maximum Virtual SCSI targets per virtual SCSI adapter  
20 = Maximum xHCI USB controllers per virtual machine  
20 = Maximum USB device connected to a virtual machine  
32 = Maximum Virtual CPUs per virtual machine (Virtual SMP)  
40 = Maximum concurrent remote console connections to a virtual machine  
60 = Maximum Virtual SCSI targets per virtual machine  
60 = Maximum Virtual Disks per virtual machine (PVSCSI)  
128MB = Maximum Video memory per virtual machine  
1TB = Maximum Virtual Machine swap file size  
1TB = Maximum RAM per virtual machine  
2TB – 512B = Maximum virtual machine Disk Size

## VCP510 (VCP on vSphere 5) Exam Cram Notes Part 3/3: Exam Passed!

After passing the exam in early October 2011 at a first attempt, here are a few notes on the exam (without infringing the confidentiality agreement) that might help you:

- i: The exam is 85 questions in 90 minutes (only slightly more time than one minute per question) so you need to know your stuff and answer the questions efficiently.
- ii: The questions are all multiple choice.
- iii: The passing score is 300 out of a maximum possible score of 500.

### Some useful resources

- i: Notes Part 1 → well worth going over and understanding, and since the notes fit nicely in a smartphone screen, it is convenient to study these whilst out and about.
- ii: Notes Part 2: vSphere 5 Configuration Maximums → are also worth going over but it is unlikely you will see many questions – perhaps only 1 or 2 – on this in the exam – then again those 1 or 2 questions can be the difference between a pass and a fail! Do not spend too much time on trying to remember these, the time can be better spent elsewhere.
- iii: Lab work → highly recommend you have a vSphere 5 lab setup and where possible practice setting up, configuring and administering all features. Especially have a good play around with / get a good understanding of:

sDRS

Storage Profiles

vSphere Distributed Switch

*\*Remember that vSphere runs nicely inside VMware Workstation / Oracle VirtualBox*

- iv: Web resources →

[Duncan Epping's vSphere 5 What's New](#)

[VMware's Official vSphere 5 Documentation](#)

[VMware's Official vSphere 5 Configuration Maximums \(PDF\)](#)

[vReference.com's vSphere 5 documentation notes \(PDF\)](#)

[VMware Communities - Interpreting ESXTOP 4.1 Statistics](#)

[Andrea Mauro's VCP5 Resources](#)

[Jason Langer's VCP5 Study Guide Page](#)

[Simon Long's VCP5 Practice Exams](#)

- v: Experience → if short on experience then going on a VMware vSphere 5 course (a prerequisite before taking the exam if not a pre-existing VCP4 – and even VCP4's will need to take the What's New course after 29<sup>th</sup> Feb 2012,) more lab work and a well written book.

- vi: Time → always the hardest resource to get enough of!

**vii:** A bit of luck!

**Final Comment**

Good luck!