

Command Line Interface Tips and Tricks for VMware ESX Server 2 and 3

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ESX Server 2.X Commands

- Removed or replaced scripts in VMware Infrastructure 3:
 - > `vmkpcidivv`
 - > `vmkchdev`
 - > `vmkbootcfg`
 - > `cos-rescan.sh`
- Retained in VMware Infrastructure 3:
 - > `vmkfstools`
 - > `vmware-cmd`

Note: Options for common commands such as `vmkfstools` may vary in different versions of ESX Server – verify option functionality before use!

vmkpcidivvy

```
vmkpcidivvy [-i[nteractive]] [-l[abel] name] [-m[emory] memsize] [-q[uey]]  
[-r[efreshnames]] [-k[vmkdumpset]] [-[c]sv][dev] bus:slot:fcn][-d[rootdev] rootdev]
```

interactive: Interactively go through the PCI divvy process.

label: Operate on the LILO configuration with the specified label.

memory: Specify memory (in megabytes) reserved for Service Console.

query: Execute a query.

refreshnames: Creates or updates the device names.

vmkdumpset: Sets the dump partition to the best available dump partition.

[csv]dev: Assign a specified device exclusively to console, shared or virtual machines.

vmkpcidivv - Interactive Mode

```
Your system is reporting approximately 2,047 MB of memory.
Note: you cannot allocate more than 800 MB to the Service Console.

If you plan to run 4 virtual machines or fewer, 128 MB should suffice.
Set this to 192 MB for 8 virtual machines, 272 MB for 16 virtual
machines, 384 MB for 32 virtual machines, or 512 MB for more than
32 virtual machines.

Amount of memory (in megs) to allocate to the Service Console [192]:
Enable hyperthreading? (Only works with 8 or less physical processors) [y]:

Now to divide the SCSI controllers and network adapters. In this process,
you will select whether to give the previous devices to the Service Console or
the virtual machines that you will be running. In order to ensure optimal
performance for your virtual machines, we suggest you allocate as many devices
as possible to the virtual machines, leaving only the ones necessary to
configure and maintain the Service Console.

Type 'c' to allocate to the Service Console or 'v' to allocate to the virtual
machines, or 's' to share between both.

RAID storage controller Compaq Computer Corporation Smart Array 64x controllers (rev 01) runnin
g on bus 2 device 1 function 0 (cciss.o) [vmhba0] [s]:
Ethernet controller BROADCOM Corporation NetXtreme BCM5704 Gigabit Ethernet (rev 10) running on
 bus 2 device 2 function 0 (bcm5700.o) [] [c]:
Ethernet controller BROADCOM Corporation NetXtreme BCM5704 Gigabit Ethernet (rev 10) running on
 bus 2 device 2 function 1 (bcm5700.o) [vmnic0] [v]:
Ethernet controller BROADCOM Corporation NetXtreme BCM5703 Gigabit Ethernet (rev 10) running on
 bus 7 device 1 function 0 (bcm5700.o) [vmnic1] [v]:
Fiber storage controller QLogic Corp QLA231x/2340 (rev 02) running on bus 10 device 1 function
0 (qla2300_607.o) [vmhba1] [v]:

Configuration complete.
Commit changes (y/n)? [y]: █
```

vmkpcidivvy Syntax

Valid queries (`vmkpcidivvy -q ...`)

Get Service Console device-file name of a VMkernel LUN (`vmhbaC:T:L`):

```
vmkpcidivvy -q vmhba_dev vmhba1:3:0
```

```
vmkpcidivvy -q vmhba_devs
```

List all the LILO boot-target menu items:

```
vmkpcidivvy -q labels
```

Show VMkernel modules that are loaded:

```
vmkpcidivvy -q vmkmod
```

Show the VMkernel core dump partition (as `vmhbaC:T:L:P`):

```
vmkpcidivvy -q vmkdump_part
```

... or, as a Service Console device-file name:

```
vmkpcidivvy -q vmkdump_dev
```

vmkfstools Syntax

`vmkfstools -? [otherarg otherarg ...] VMFS-path`

- The option flag **-?** specifies the action of the command
- Actually an entire suite of commands (hence, “. . . tools”)

VMFS Operations:

- C Create a new VMFS file system in a LUN
- P Query the file system's attributes
- Z Extend (span) the file system onto an extent (additional LUN)
- L Manage SCSI reservations (“locks”)

Virtual Disk Operations

- c Create a new virtual disk (file)
- X Extend a virtual disk
- r Create a new RDM in the file system (map a raw LUN to it)

CLI Access in VMware Infrastructure 3

- Direct root user ssh connections are disabled by default in fresh installations of ESX 3.0
- The recommended way to access the system is to ssh to the server as a non-root user and then use the su command to switch to the root account; this leaves an audit trail for accountability purposes
- An alternative way to allow root access is to configure ssh to allow the root user to log in
 - Update the ssh configuration file:
 - # vi /etc/ssh/sshd_config
 - ...
 - PermitRootLogin yes
 - ...
 - Restart the ssh daemon:
 - # service sshd restart

CLI in VMware Infrastructure 3

- Changes made via command line interfaces might not be visible to the VirtualCenter Server without restarting the vmware-hostd daemon
- Restarting vmware-hostd will cause the system to re-read the ESX configuration file `/etc/vmware/esx.conf`
 - To halt the daemon prior to changes:
 - `# service mgmt-vmware stop`
 - To start the daemon after changes:
 - `# service mgmt-vmware start`
 - To force a re-read of `/etc/vmware/esx.conf`:
 - `# service mgmt-vmware restart`

Configuration File Changes

- The `/etc/vmware/esx.conf` file is the master configuration file for ESX Server 3.0

Old File	New file	Notes
<code>hwconfig</code>	<code>esx.conf</code>	
<code>devnames.conf</code>		No longer necessary, was duplicated in <code>hwconfig</code> now in <code>esx.conf</code>
<code>vmkmodule.conf</code>	<code>esx.conf</code>	Keys start with <code>/vmkmodule</code>
<code>netmap.conf</code>	<code>esx.conf</code>	See the <code>prettyName</code> entry for each <code>portgroup</code>
<code>vmkconfig</code>	<code>esx.conf</code>	Keys start with <code>/adv</code>

Use the `esxcfg-*` tools or Virtual Infrastructure Client to configure ESX!

esxcfg-*

- Suite of commands kept in /usr/sbin
- Named for easy correlation between command and function
- Online help available for most commands by using the `-h` option
- Designed to replace functionality from retired commands such as `vmkpcidivvy` and `cos-rescan.sh`

- Old:

```
# vmkpcidivvy -q vmhba_devs  
# cos-rescan.sh vmhba1
```

- New:

```
# esxcfg-vmhbadevs  
# esxcfg-rescan vmhba1
```

Hint: Type `esxcfg-<tab><tab>` for a complete list of the commands.

CLI Comparisons

- The `esxcfg-*` commands replace many standard options from the previous version

Old Command	New Command	Notes
<code>cos-rescan.sh</code>	<code>esxcfg-rescan</code>	Rescan for new LUNs
<code>vmkbootcfg</code>	<code>esxcfg-boot</code>	Manage the boot partitions
<code>vmkchdev</code>	<code>esxcfg-info</code>	Print out device configurations
<code>vmkpcidivv -q vmkdump_part</code>	<code>esxcfg-dumppart -l</code>	Manage the <code>vmkdump</code> partition
<code>vmkpcidivv -q vmhba_devs</code>	<code>esxcfg-vmhbadevs</code>	Map <code>vmhbaC:T:L</code> names to Linux device files
<code>vmkpcidivv -q vmkmod</code>	<code>esxcfg-module -l</code>	List modules loaded in the service console

esxcfg-* Command Types

■ Networking

- > esxcfg-firewall
- > esxcfg-route
- > esxcfg-vmknic
- > esxcfg-vswif
- > esxcfg-vswitch
- > esxcfg-nics

■ Storage

- > esxcfg-dumppart
- > esxcfg-mpath
- > esxcfg-nas
- > esxcfg-swiscsi
- > esxcfg-vmhbadevs

■ Service Console Administration

- > esxcfg-info
- > esxcfg-advcfg
- > esxcfg-resgrp

Network Management

- Service console networking problems might require manual virtual switch reconfiguration from the physical console
- Use the `esxcfg-vswitch` command to reassign physical NICs to virtual switches
 - Display current configurations:
 - `# esxcfg-vswitch -l`
 - Detach a physical NIC from a virtual switch:
 - `# esxcfg-vswitch -U <pnice> <vSwitch_name>`
 - Link a physical NIC to a virtual switch:
 - `# esxcfg-vswitch -L <pnice> <vSwitch_name>`

Modifying Service Console Networking

```
# esxcfg-nics -l
```

Name	PCI	Driver	Link	Speed	Duplex	Description
vmnic0	02:02.00	tg3	Up	1000Mbps	Full	Broadcom ...
vmnic1	02:02.01	tg3	Up	1000Mbps	Full	Broadcom ...
vmnic2	0a:01.00	tg3	Up	1000Mbps	Full	Broadcom ...

```
# esxcfg-vswitch -l
```

Switch Name	Num Ports	Used Ports	...	Uplinks
vSwitch0	64	3	...	vmnic0

PortGroup Name	Internal ID	...	Uplinks
Service Console	portgroup0		vmnic0

Modifying Service Console Networking (cont.)

```
# esxcfg-vswitch -U vmnic0 vSwitch0
```

```
# esxcfg-vswitch -L vmnic2 vSwitch0
```

```
# esxcfg-vswitch -l
```

Switch Name	Num Ports	Used Ports	...	Uplinks
vSwitch1	64	3	...	vmnic2

PortGroup Name	Internal ID	...	Uplinks
Service Console	portgroup1		vmnic2

esxcfg-info

- The `/proc/vmware` interface is deprecated
 - Some data items are no longer presented there
 - Little will be added to `/proc/vmware` in the future
- All information now comes from the VMware SysInfo (VSI) interface
- To view from command-line:
 - `esxcfg-info -a | more`
- To access programmatically, use SDK

Service Console Firewall

- The service console in ESX 3.0 is protected by an `iptables` firewall
- Use `esxcfg-firewall` to administer
- By default, only services required by VMware Infrastructure are enabled; all other services must be activated by the administrator via the VI Client or CLI
- Service ports are opened either by known service name or by individual port number
- Opening a port by service name:

```
# esxcfg-firewall -e smbClient
```
- Opening a port by service name:

```
# esxcfg-firewall -o 123,udp,out,ntp
```

iptables Known Services

- AAMClient*
- CIMHttpServer*
- CIMHttpsServer*
- CIMSLP*
- commvaultDynamic
- commvaultStatic
- ftpClient
- ftpServer
- LicenseClient*
- nfsClient
- nisClient
- ntpClient
- smbClient
- snmpd
- sshClient
- sshServer*
- swlSCSIClient
- telnetClient
- TSM
- veritasBackupExec
- veritasNetBackup
- vncServer
- vpxHearbeats*

* Indicates the service is enabled by default

`/usr/lib/vmware/bin/storageMonitor`

- New feature of VI-3
- Monitors SCSI sense errors experienced by storage devices attached to an ESX Server
- Can be used to troubleshoot storage problems in the ESX Server environment
- Polls the storageMonitor running in the vmkernel and can send output to standard output, a user-defined log file or the system log
- Configuration files can be created to filter which sense error messages will be displayed or omitted from the output
- Default configuration file (`/etc/vmware/storageMonitor.conf`) can be overridden with custom configuration file created by the administrator
- Runs in either interactive or daemon mode

storageMonitor Syntax

```
storageMonitor [-c <config file>] [-d [-l <log file>] [-s]] [-h] [-p <poll interval>]
```

-c <config file>: Specify non-standard configuration file

(default: /etc/vmware/storageMonitor.conf)

-d: Run in daemon mode.

-l <log file>: Log information in a user-defined log file (default: syslog).

-s: Send log information to stdout.

-h: Creates or updates the device names.

-p <poll interval>: Sets the interval (in seconds) used for polling kernel resident storage and retrieving status/errors of the storage devices

(default: 10 sec.)

esxcfg-* Commands

- `esxcfg-advcfg` Sets advanced VMkernel options
- `esxcfg-auth` Authentication configuration
- `esxcfg-boot†` Configure boot, including PCI allocation
- `esxcfg-dumppart` Set, activate, deactivate, list potential and current VMkernel dump partitions
- `esxcfg-firewall` Configure firewalling options.
- `esxcfg-info` Prints information about the service console, the VMkernel, various subsystems in the virtual network and storage resource hardware
- `esxcfg-init†` Perform initialization steps in the initrd
- `esxcfg-linuxnet` Converts vswif devices to eth when booting into Linux debugging mode
- `esxcfg-upgrade†` Upgrade from ESX Server 2.X to 3.0

† *Should not be run unless instructed to do so by VMware Technical Support Representative*

esxcfg-* Commands (cont.)

- *esxcfg-mpath* Multipathing configuration
- *esxcfg-nas* Add, delete or manage NAS file systems
- *esxcfg-nics* Presents physical NIC information
- *esxcfg-rescan* Rescan LUNs on SCSI device
- *esxcfg-resgrp* Create, delete and list resource groups
- *esxcfg-route* Enable or disable routing for vmknics
- *esxcfg-swscsi* Configures software iSCSI adapters
- *esxcfg-vmhbadevs* Maps COS device files to vmhba names
- *esxcfg-vmknic* Create & configure VMkernel NICs
- *esxcfg-vswif* Create & configure vswifs for the COS
- *esxcfg-vswitch* Create & configure virtual switches and port groups

More complete descriptions available in Appendix A of the Server Configuration Guide

Questions?



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