



SER2965BU

# Advanced Troubleshooting of ESXi Server 6.x for vSphere Gurus

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#VMworld #SER2965BU

A portrait of a man in a suit and tie, looking slightly to the right. The background behind him is a dark, stylized circuit board pattern. The text 'I AM A PIONEER' is written in a large, bold, blue, hand-painted font across the bottom right of the image.

I AM A PIONEER

vmworld 2017

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chmod 777 <*user*>

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# Do You Know?

1. Configuration Files?

2. Commands?

3. Log Files?

in ESXi Server



# Learner Objectives

- Improvise troubleshooting steps for a vSphere admin by
  - Understanding the ESXi Architecture from a component breakdown perspective
  - Learn “7” important and key :-
    1. Log Files : which log files to review and when
    2. ESXi Commands : to isolate and troubleshoot issues
    3. Configuration Files : forms the backbone of troubleshooting sessions

Every VMworld session is time bound and we will cover as much as we can.

For all remaining questions, we are always a phone call away.

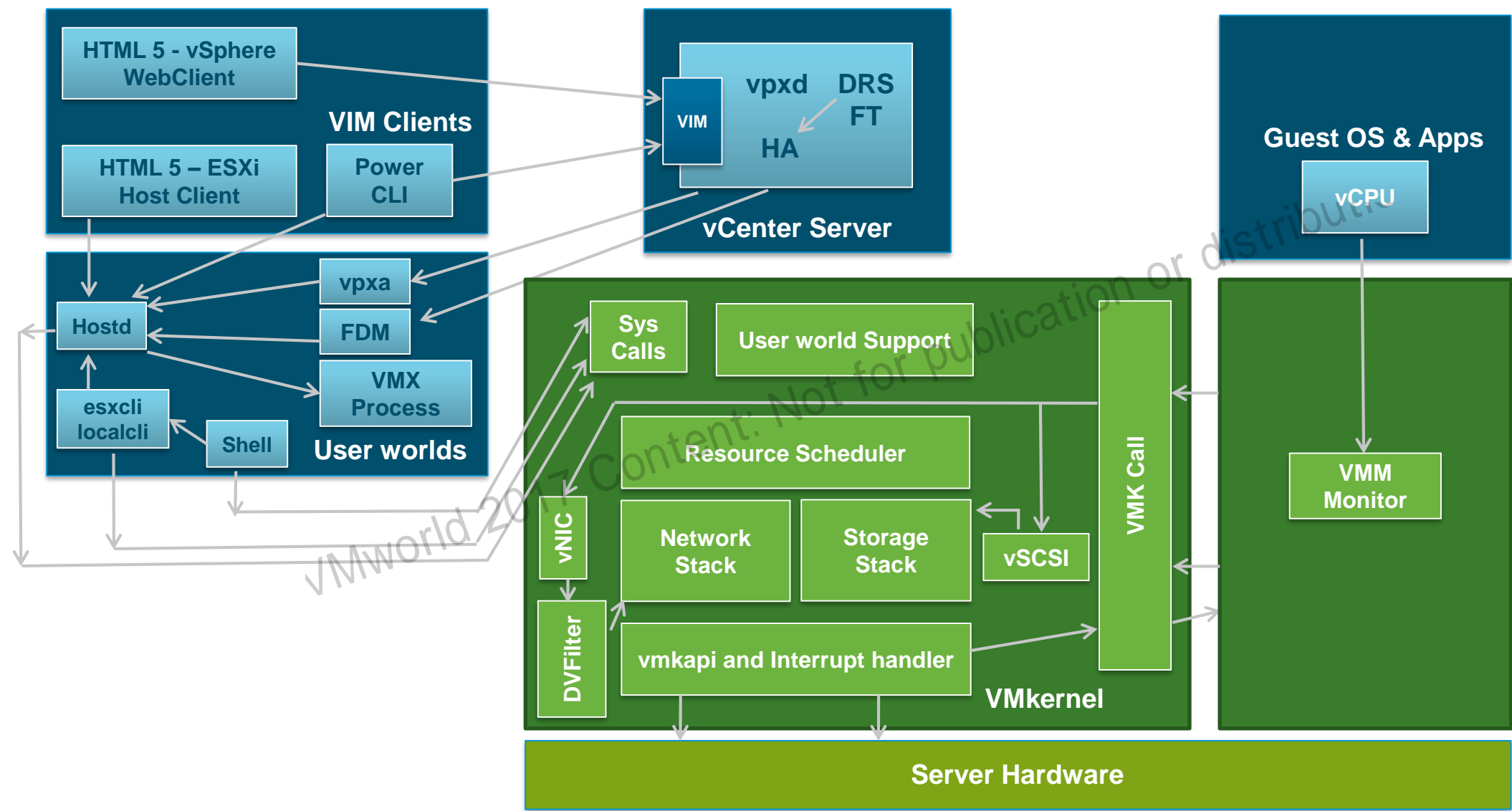
# Agenda

- 1 7 Important Log files
- 2 7 Key ESXi Commands
- 3 7 Significant Configuration Files





# ESXi – Architecture





# ESXi Log Files



# 1. vmksummary.log – Abrupt Host reboots

- Time stamp indicating ESXi server reboot

```
2017-07-07T14:00:02Z heartbeat: up 26d16h29m46s, 1 VM; [[35570 sfcb-vmware_bas 32676kB] [34341 hostd-worker 38852kB] [724939 vmx 41493
24kB]] [[35624 sfcb-vmware_raw 0%max] [35642 sfcb-hhrc 0%max] [724939 vmx 0%max]]
2017-07-07T14:10:34Z bootstop: Host is rebooting
2017-07-07T15:42:34Z bootstop: Host has booted
2017-07-07T16:00:01Z heartbeat: up 0d0h20m50s, 0 VMs; [[35571 sfcb-pycim 16892kB] [35577 sfcb-vmware_bas 22624kB] [34347 hostd-worker
35880kB]] [[36281 sleep 0%max] [36282 sh 0%max] [36285 python 0%max]]
2017-07-07T17:00:02Z heartbeat: up 0d1h20m51s, 1 VM; [[35577 sfcb-vmware_bas 22628kB] [34347 hostd-worker 36340kB] [36320 vmx 4179968k
B]] [[38861 sleep 0%max] [38865 sh 0%max] [38868 python 0%max]]
2017-07-07T18:00:02Z heartbeat: up 0d2h20m51s, 1 VM; [[35577 sfcb-vmware_bas 22720kB] [34347 hostd-worker 36380kB] [36320 vmx 4179968k
B]] [[41429 sleep 0%max] [41430 sh 0%max] [41433 python 0%max]]
```

- VMkernel will always track Host reboots, the below shows host rebooting has not been tracked

```
2017-07-16T18:00:02Z heartbeat: up 415d1h59m24s, 3 VMs; [[26415505 vmx 3995744kB] [38815910 vmx 8267776kB]
277 sfcb-vmware_raw 5%max] [35063 sfcb-pycim 18%max] [35069 sfcb-vmware_bas 24%max]]
2017-07-16T19:00:01Z heartbeat: up 415d2h59m23s, 3 VMs; [[26415505 vmx 3995700kB] [38815910 vmx 8267776kB]
277 sfcb-vmware_raw 5%max] [35063 sfcb-pycim 18%max] [35069 sfcb-vmware_bas 24%max]]
2017-07-16T21:13:56Z bootstop: Host has booted
2017-07-16T22:00:01Z heartbeat: up 0d0h46m55s, 3 VMs; [[35026 vmx 4073472kB] [35437 vmx 4946520kB] [35375
-vmware_raw 5%max] [35069 sfcb-vmware_bas 16%max] [35063 sfcb-pycim 17%max]]
2017-07-16T23:00:01Z heartbeat: up 0d1h46m55s, 3 VMs; [[35026 vmx 4073472kB] [35437 vmx 4985408kB] [35375
-vmware_raw 5%max] [35069 sfcb-vmware_bas 16%max] [35063 sfcb-pycim 17%max]]
2017-07-17T00:00:01Z heartbeat: up 0d2h46m55s, 3 VMs; [[35026 vmx 4073472kB] [35437 vmx 5161504kB] [35375
-vmware_raw 5%max] [35069 sfcb-vmware_bas 16%max] [35063 sfcb-pycim 17%max]]
```

- Disable the Automated Server Recovery feature from the BIOS to avoid automatic reboots

## 2. boot.gz log - Slow Boot Issues

- To troubleshoot both slow boot and boot process hang of ESXi server
- Location : /var/log/boot.gz
- Use DCUI - Alt + F12 to review VMkernel messages during this time
- Enabling Serial logging using (Shift + o) at the start up screen for log redirection
  - vmkBootVerbose=TRUE vmbLog=TRUE logPort=com1
  - debugLogToSerial=1 logPort=com1 no-auto-partition bootUUID=xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

## 2. boot.gz log - Slow Boot Issues

- Slow ESXi Boot Issues when, RDM devices are not perennially tagged
- Validate the esx.conf file with a key word search “perennialResvd” with respect to the NAA.ID of the LUN

```
/storage/lun[naa.50060160c720237250060160c7202372]/fromUser = "false"  
/storage/lun[naa.50060160c720237250060160c7202372]/perennialResvd = "true"  
/storage/lun[naa.50060160c720237250060160c7202372]/displayName = "DGC iSCSI Disk (naa.50060160c720237250060160c7202372) "  
/storage/lun[naa.600601606ed02c00b20d51c2d245e711]/displayName = "DGC iSCSI Disk (naa.600601606ed02c00b20d51c2d245e711) "  
/storage/lun[naa.600601606ed02c00b20d51c2d245e711]/fromUser = "false"  
/storage/lun[naa.50060160bce02d5550060160bce02d55]/fromUser = "false"
```

- Command to set the perennially reserve tag per LUN

**# esxcli storage core device setconfig -d naa.id --perennially-reserved=true**

### 3. hostd & hostd-probe.log – ESXi Not Responding

- hostd unresponsive and Host Not responding from vCenter server
- A successful hostd process start up or working fine hostd process should finish reading and populating the “vmInventory.xml” file

```
less hostd-probe.log
hostd detected to be non-responsive
2017-07-27T16:40:02.008Z Section for VMware ESX, pid=18315463, version=6.0.0, build=5050593, option=Release
2017-07-27T16:40:02.008Z verbose hostd-probe[FFF18350] [Originator@6876 sub=Default] Dumping early logs:
2017-07-27T16:40:02.008Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] Logging uses fast path: true
2017-07-27T16:40:02.009Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] The bora/lib logs WILL be handled by VmaCore
2017-07-27T16:40:02.009Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] Initialized channel manager
2017-07-27T16:40:02.009Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] Current working directory: /var/log/vmware
2017-07-27T16:40:02.009Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] Syscommand enabled: true
2017-07-27T16:40:02.009Z info hostd-probe[FFF18350] [Originator@6876 sub=Default] ReaperManager Initialized
2017-07-27T17:00:01.933Z warning hostd-probe[FF92A350] [Originator@6876 sub=Default] TimeoutException -- Operation timed out
hostd detected to be non-responsive
2017-07-27T17:10:02.029Z warning hostd-probe[FFF18350] [Originator@6876 sub=Default] TimeoutException -- Operation timed out
hostd detected to be non-responsive
```

- Direct Connect to the ESXi with Host client should also validate the hostd status
- Do NOT restart the ESXi Server when hostd is in a loop if you need to pursue the cause

### 3. hostd.log – ESXi Not Responding

- Understanding the Hostd status and validating the Hostd service restart is successful

```
[root@is-tse-d128:/var/log] vim-cmd /vmtoolsd/getallvms
```

Vmid	Name	File	Guest OS	Version	Annotation
2	Afeemi	[is-tse-d128-1] Afeemi/Afeemi.vmx	windows7Server64Guest	vmx-11	
3	UNS-PSC	[is-tse-d128-1] UNS-PSC/UNS-PSC.vmx	sles11_64Guest	vmx-08	VMware vCenter Server Appliance

```
[root@is-tse-d128:/var/log]
```

- Key words search in hostd.log – “BEGIN SERVICES”

```
--> 7583d000-75900000 ---- 00000000 00:00 0
--> 75900000-75aac000 ---- 00000000 00:00 0
--> 75abf000-760e2000 ---- 00000000 00:00 0
--> 76100000-762f4000 ---- 00000000 00:00 0
--> 76300000-76dd2000 ---- 00000000 00:00 0
--> 76dd2000-76df3000 ---- 00000000 00:00 0
--> 76e00000-76f82000 ---- 00000000 00:00 0
--> 76f94000-76fe0000 ---- 00000000 00:00 0
--> 77000000-77100000 ---- 00000000 00:00 0
--> 77120000-771e3000 ---- 00000000 00:00 0
--> 77200000-776c3000 ---- 00000000 00:00 0
--> 77741000-77782000 ---- 00000000 00:00 0
--> 77800000-77d00000 ---- 00000000 00:00 0
--> fff4b000-fffd0000 ---- 00000000 00:00 0 stack
-->
2017-07-20T14:14:15.494Z info hostd[FFFDCA80] [Originator@6876 sub=UW Memory checker] Check resources every 30 secs, soft limit 498924, hard limit 623656.
2017-07-20T14:14:15.495Z info hostd[FFFDCA80] [Originator@6876 sub=Default] BEGIN SERVICES
2017-07-20T14:14:15.495Z info hostd[FFFDCA80] [Originator@6876 sub=Vimsvc.ha-eventmgr] Event 1 : VMware Host Agent started on host is-tse-d128.isl.vmware.com.
2017-07-20T14:14:20.002Z info hostd[76281B70] [Originator@6876 sub=Statssvc.vim.PerformanceManager] InitCache: Initializing...
2017-07-20T14:14:20.014Z info hostd[76281B70] [Originator@6876 sub=Libs] Common: MSR 0x3a = 0x5
```



## 4. vmware.log - Virtual Machine Issues

- VM Power ON issues
- Attempt a Virtual Machine power ON and then validate the below log
- Identify the cause of the Power ON failure

```
2017-08-09T07:17:00.818Z| Worker#3| I120: DISKLIB-VMFS : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_5-000001-delta.vmdk" : open successful (14) size = 16801792, hd = 17860066. Type 8
2017-08-09T07:17:00.818Z| Worker#3| I120: DISKLIB-DSCPTR: Opened [0]: "UNS-PSC_5-000001-delta.vmdk" (0xe)
2017-08-09T07:17:00.818Z| Worker#3| I120: DISKLIB-LINK : Opened '/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_5-000001.vmdk' (0xe): vmfsSparse, 20971520 sectors / 10 GB
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-VMFS : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000001-delta.vmdk" : open successful (14) size = 16789504, hd = 22775269. Type 8
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-DSCPTR: Opened [0]: "UNS-PSC_4-000001-delta.vmdk" (0xe)
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-LINK : Opened '/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000001.vmdk' (0xe): vmfsSparse, 10485760 sectors / 5 GB.
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-LINK : DiskLinkIsAttachPossible: Content ID mismatch (parentCID a56ab7fd != a70fc7fc) /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000002.vmdk /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000001.vmdk.
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-CHAIN : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000001.vmdk" : failed to open (The parent virtual disk has been modified since the child was created. The content ID of the parent virtual disk does not match the corresponding parent content ID in the child).
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-VMFS : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000002-delta.vmdk" : closed.
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-VMFS : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000001-delta.vmdk" : closed.
2017-08-09T07:17:00.819Z| Worker#1| I120: DISKLIB-LIB : Failed to open '/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000002.vmdk' with flags 0xa The parent virtual disk has been modified since the child was created. The content ID of the parent virtual disk does not match the corresponding parent content ID in the child (18).
2017-08-09T07:17:00.819Z| Worker#1| I120: DISK: Cannot open disk "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_4-000002.vmdk": The parent virtual disk has been modified since the child was created. The content ID of the parent virtual disk does not match the corresponding parent content ID in the child (18).
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-VMFS : "/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_5-flat.vmdk" : open successful (14) size = 10737418240, hd = 19367400. Type 3
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-DSCPTR: Opened [0]: "UNS-PSC_5-flat.vmdk" (0xe)
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-LINK : Opened '/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/UNS-PSC/UNS-PSC_5.vmdk' (0xe): vmfs, 20971520 sectors / 10 GB.
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-CHAINESX : ChainESXOpenSubChain: numLinks = 3, numSubChains = 1
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-CHAINESX : ChainESXOpenSubChain: (0) fid = 19367400, extentType = 2
2017-08-09T07:17:00.820Z| Worker#3| I120: DISKLIB-CHAINESX : ChainESXOpenSubChain: (1) fid = 17860066, extentType = 0
```



## 5. vmkernel.log - Storage Issues

Understanding SCSI Sense codes are key for Storage issues

```
2017-08-07T14:04:40.045Z cpu0:1625352)ScsiScan: 836: Path vmhba42:C0:T0:L0 supports REPORT LUNS 0x11
2017-08-07T14:09:39.935Z cpu14:1624957)ScsiScan: 836: Path vmhba42:C0:T0:L0 supports REPORT LUNS 0x11
2017-08-07T14:09:40.047Z cpu0:32807)NMP: nmp_ThrottleLogForDevice:3178: Cmd 0x1a (0x439d8cea1240, 0) to dev "mpx.vmhba41:C0:T0:L0" on
path "vmhba41:C0:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x20 0x0. Act:NONE
2017-08-07T14:14:39.939Z cpu23:32830)NMP: nmp_ThrottleLogForDevice:3178: Cmd 0x1a (0x439d80b81bc0, 0) to dev "mpx.vmhba41:C0:T0:L0" on
path "vmhba41:C0:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x20 0x0. Act:NONE
2017-08-07T14:14:40.045Z cpu11:1625945)ScsiScan: 836: Path vmhba42:C0:T0:L0 supports REPORT LUNS 0x11
2017-08-07T14:14:45.676Z cpu1:33415)NMP: nmp_ThrottleLogForDevice:3178: Cmd 0x1a (0x439d8cc10380, 0) to dev "naa.644a842013597a001c878
c8117ec461e" on path "vmhba0:C2:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x24 0x0. Act:NONE
2017-08-07T14:14:45.677Z cpu1:33415)ScsiDeviceIO: 2645: Cmd(0x439d8cc10380) 0x1a, CmdSN 0xd7d0 from world 0 to dev "naa.644a842013597a
001c878c8117ec461e" failed H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x24 0x0.
2017-08-07T14:14:45.677Z cpu1:33415)NMP: nmp_ThrottleLogForDevice:3178: Cmd 0x85 (0x439d8cc10380, 944062) to dev "naa.644a842013597a00
1c878c8117ec461e" on path "vmhba0:C2:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x20 0x0. Act:NONE
2017-08-07T14:14:45.677Z cpu1:33415)ScsiDeviceIO: 2645: Cmd(0x439d8cc10380) 0x4d, CmdSN 0x12d9 from world 944062 to dev "naa.644a84201
3597a001c878c8117ec461e" failed H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x20 0x0.
2017-08-07T14:14:45.677Z cpu1:33415)NMP: nmp_ThrottleLogForDevice:3178: Cmd 0x1a (0x439d8cc10380, 944062) to dev "naa.644a842013597a00
1c878c8117ec461e" on path "vmhba0:C2:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x24 0x0. Act:NONE
2017-08-07T14:14:45.677Z cpu1:33415)ScsiDeviceIO: 2645: Cmd(0x439d8cc10380) 0x1a, CmdSN 0x12da from world 944062 to dev "naa.644a84201
3597a001c878c8117ec461e" failed H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x24 0x0.
2017-08-07T14:14:45.677Z cpu1:33415)ScsiDeviceIO: 2645: Cmd(0x439d8cc10380) 0x1a, CmdSN 0xd7d5 from world 0 to dev "naa.644a842013597a
001c878c8117ec461e" failed H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x24 0x0.
```

- SCSI codes which are T10 org defined codes

<http://www.t10.org/lists/2op.htm>

- SCSI sense codes

<http://www.virtten.net/vmware/esxi-scsi-sense-code-decoder/>

## 6. vobd.log - Network & Storage Issues

- Network showing uplink transition

```
2017-07-10T03:32:05.304Z: [APDCorrelator] 215578572164us: [esx.clear.storage.apd.exit] Device or filesystem with identifier [6963d5f1-c9a270b4] has exited the All Paths Down state.
2017-07-11T11:12:30.603Z: [netCorrelator] 329604438896us: [vob.net.pg.uplink.transition.down] Uplink: vmnic0 is down. Affected portgroup: Management Network. 0 uplinks up. Failed criteria: 128
2017-07-11T11:12:30.603Z: [netCorrelator] 329604438954us: [vob.net.vmnick.linkstate.down] vmnic vmnic0 linkstate down
2017-07-11T11:12:32.001Z: [netCorrelator] 329605269053us: [esx.problem.net.connectivity.lost] Lost network connectivity on virtual switch "vSwitch0". Physical NIC vmnic0 is down. Affected port groups: "Management Network"
2017-07-11T11:12:33.614Z: [netCorrelator] 329607450431us: [vob.net.vmnick.linkstate.up] vmnic vmnic0 linkstate up
2017-07-11T11:12:33.716Z: [netCorrelator] 329607552499us: [vob.net.pg.uplink.transition.up] Uplink:vmnic0 is up. Affected portgroup: Management Network. 1 uplinks up
```

- Storage disconnect messages

```
2017-07-27T15:13:26.407Z: [netCorrelator] 1221224773736us: [vob.net.firewall.config.changed] Firewall configuration has changed. Operation 'disable' for rule set vpxHeartbeats succeeded.
2017-07-27T15:13:26.407Z: [netCorrelator] 1221222666698us: [esx.audit.net.firewall.config.changed] Firewall configuration has changed. Operation 'disable' for rule set vpxHeartbeats succeeded.
2017-07-27T15:14:41.826Z: [iscsiCorrelator] 1221295995395us: [vob.iscsi.target.connect.error] vmhba42 failed to login to iqn.1992-04.com.emc:cx.ckm00120700598.b6 because of a network connection failure.
2017-07-27T15:14:41.826Z: [netCorrelator] 1221291321608us: [vob.net.firewall.config.changed] Firewall configuration has changed. Operation 'disable' for rule set ntpClient succeeded.
2017-07-27T15:14:41.828Z: [iscsiCorrelator] 1221298087299us: [esx.problem.storage.iscsi.target.connect.error] Login to iSCSI target iqn.1992-04.com.emc:cx.ckm00120700598.b6 on vmhba42 failed. The iSCSI initiator could not establish a network connection to the target.
2017-07-27T15:14:41.828Z: [netCorrelator] 1221298087362us: [esx.audit.net.firewall.config.changed] Firewall configuration has changed. Operation 'disable' for rule set ntpClient succeeded.
```



## 7. fdm.log – High Availability (HA) Issues

to identify :-

- the HostID?
- the Host is a Slave or Master?
- the Host that was isolated from cluster?

```
/opt/vmware/fdm/fdm/prettyPrint.sh hostlist | less
```

```
<host>
  <hostId>host-10</hostId>
  <hostName>10.109.10.155</hostName>
  <sslThumbprint>54:57:7A:D8:48:53:BE:FB:7E:3F:08:0C:6A:43:E9:AF:5C:D4:08:2C</sslThumbprint>
  <ipAddress>10.109.44.30</ipAddress>
  <mac>ec:f4:bb:ec:65:d8</mac>
  <mac>ec:f4:bb:ec:65:da</mac>
  <mac>ec:f4:bb:ec:65:dc</mac>
  <mac>ec:f4:bb:ec:65:dd</mac>
  <heartbeatDatastore>/vmfs/volumes/77cc5c6f-ea649dc2</heartbeatDatastore>
  <hostdPort>443</hostdPort>
  <version>6.5.0</version>
  <build>5969303</build>
  <hostInfoState>KNOWN</hostInfoState>
</host>
```

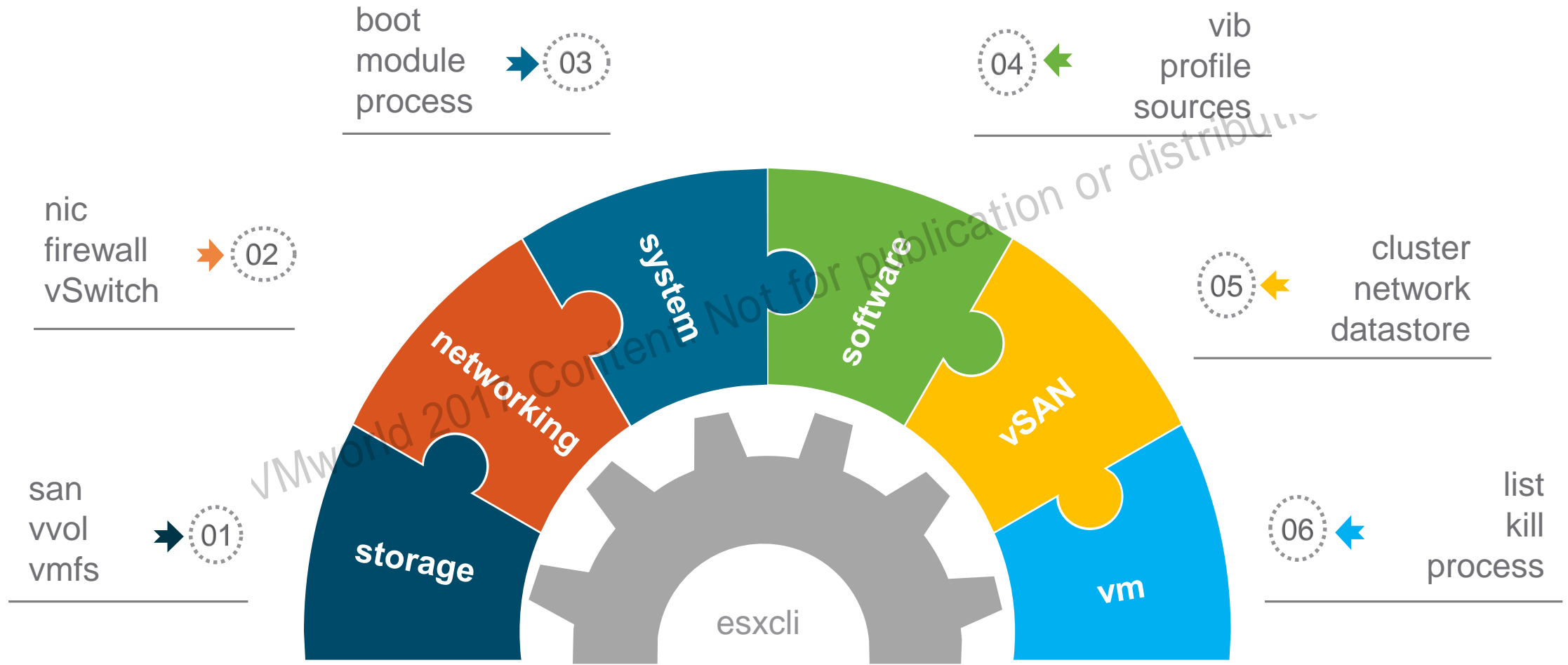
```
ster opID=SWI-3ab50c2a] [ClusterManagerImpl::LogState] hostId=host-10 state=Slave master=host-29 isolated=false host-list-version
Cluster opID=SWI-3ab50c2a] [HBDatastore::Heartbeat] Creating heartbeat file for /vmfs/volumes/77cc5c6f-ea649dc2
uster opID=SWI-b9d22b0] mkdir(/vmfs/volumes/77cc5c6f-ea649dc2/.vSphere-HA) failed with Read-only file system
uster opID=SWI-b9d22b0] [HBDatastore::OpenHeartbeatFile] Can't verify datastore path for datastore /vmfs/volumes/77cc5c6f-ea649dc2
Cluster opID=SWI-3ab50c2a] [HBDatastore::Heartbeat] Creating heartbeat file for /vmfs/volumes/77cc5c6f-ea649dc2
uster opID=SWI-9709c15] mkdir(/vmfs/volumes/77cc5c6f-ea649dc2/.vSphere-HA) failed with Read-only file system
uster opID=SWI-9709c15] [HBDatastore::OpenHeartbeatFile] Can't verify datastore path for datastore /vmfs/volumes/77cc5c6f-ea649dc2
Cluster opID=SWI-3ab50c2a] [HBDatastore::Heartbeat] Creating heartbeat file for /vmfs/volumes/77cc5c6f-ea649dc2
uster opID=SWI-312b91e5] mkdir(/vmfs/volumes/77cc5c6f-ea649dc2/.vSphere-HA) failed with Read-only file system
uster opID=SWI-312b91e5] [HBDatastore::OpenHeartbeatFile] Can't verify datastore path for datastore /vmfs/volumes/77cc5c6f-ea649dc2
Cluster opID=SWI-3ab50c2a] [HBDatastore::Heartbeat] Creating heartbeat file for /vmfs/volumes/77cc5c6f-ea649dc2
uster opID=SWI-74f7f84d] mkdir(/vmfs/volumes/77cc5c6f-ea649dc2/.vSphere-HA) failed with Read-only file system
uster opID=SWI-74f7f84d] [HBDatastore::OpenHeartbeatFile] Can't verify datastore path for datastore /vmfs/volumes/77cc5c6f-ea649dc2
Cluster opID=SWI-3ab50c2a] [HBDatastore::Heartbeat] Creating heartbeat file for /vmfs/volumes/77cc5c6f-ea649dc2
uster opID=SWI-3b72f5f6] mkdir(/vmfs/volumes/77cc5c6f-ea649dc2/.vSphere-HA) failed with Read-only file system
uster opID=SWI-3b72f5f6] [HBDatastore::OpenHeartbeatFile] Can't verify datastore path for datastore /vmfs/volumes/77cc5c6f-ea649dc2
HttpConnectionPool-000000] [RemoveConnection] Connection removed; cnx: <SSL(<io_obj p:0x06a01250, h:-1, <TCP '0.0.0.0:0'>, <TCP '
HttpConnectionPool-000000] [RemoveConnection] Connection removed; cnx: <io_obj p:0x0550af98, h:-1, <TCP '0.0.0.0:0'>, <TCP '127.0
```

# ESXi Commands



VMworld 2017 Content: Not for publication or distribution

# 1. To Monitor & Configure ESXi Server Settings...



# # esxcli

Displaying the ARP  
and Neighbor  
Discovery cache

```
[root@is-tse-d128:~] esxcli network ip netstack neighbor -s vmk0
Neighbor          Mac Address      Interface      Expiry      State      Type
-----
10.109.10.11      00:1d:09:05:90:69 vmk0           923 sec     Unknown   Unknown
10.109.8.37       2c:76:8a:aa:db:f0 vmk0           1197 sec    Unknown   Unknown
10.109.11.253     00:21:55:08:ec:40 vmk0           1199 sec    Unknown   Unknown
10.109.15.204     00:60:16:4b:e5:60 vmk1           586 sec     Unknown   Unknown
10.109.15.253     00:21:55:08:ec:40 vmk1           1199 sec    Unknown   Unknown
[root@is-tse-d128:~] esxcli network ip netstack neighbor -s vmk0
VMX World ID information
```

VMX Cartel ID  
information

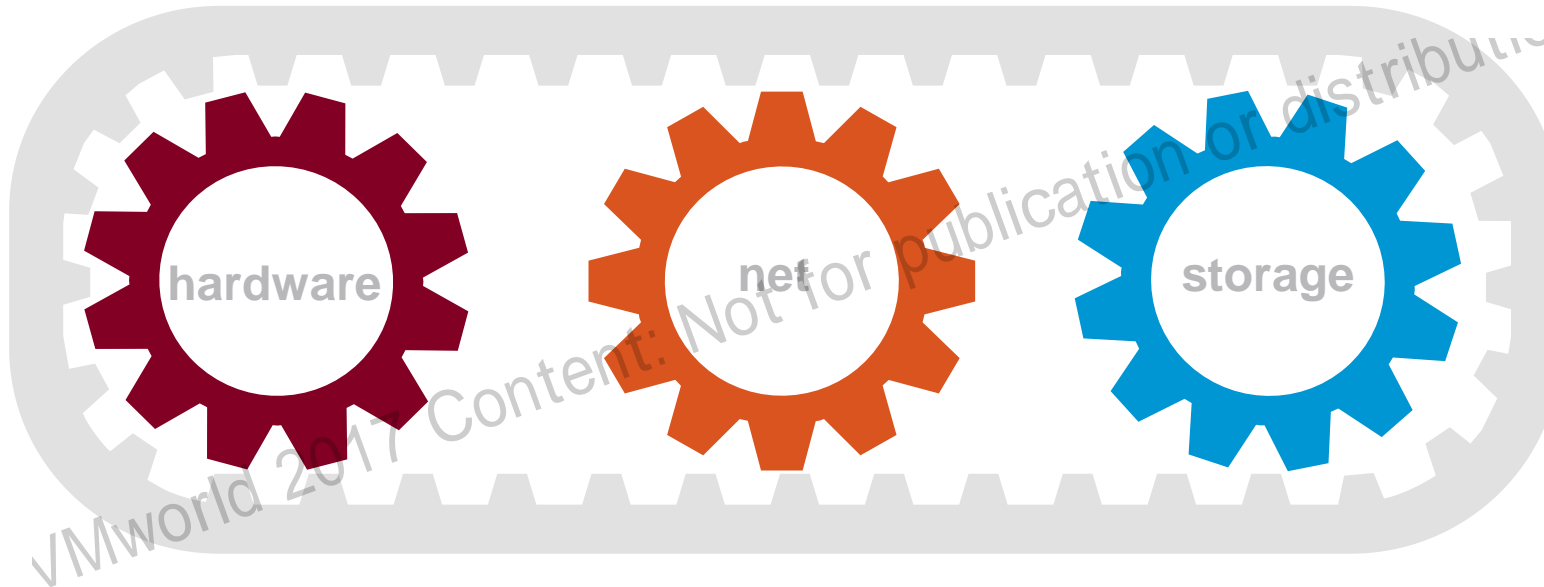
```
[root@is-tse-d128:~] esxcli vmx create --world-id 920378 --process-id 0
New Virtual Machine
World ID: 920378
Process ID: 0
VMX Cartel ID: 920377
UUID: 56 4d c0 48 e0 5a ce f6-68 95 a5 61 48 87 56 68
Display Name: New Virtual Machine
Config File: /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/New Virtual Machine/New Virtual Machine.vmx
[root@is-tse-d128:~]
```

# esxcli

## 2. VMkernel Sysinfo Shell Command...

**\*\*** # vsish

get <opt.1>/<opt.2>/<opt.3>,....



/bios  
/hardwareInfo

/pNics/vmnic<>/stats  
/portsets/vSwitch<>/stats

/scsifw/devices/.<>/stats  
/scsifw/adapters/.<>/stats



# # vsish

```
/> get /sched/groups/50453/stats/cpuStatsDir/cpuStats
```

```
group CpuStats {
    number of vsmpts:6
    size:17
    used-time:119915658 usec
    latency-stats:latency-stats {
        cpu-latency:12919336 usec
        memory-latency:memory-latency {
            swap-fault-time:0 usec
            swap-fault-count:0
            compress-fault-time:0 usec
            compress-fault-count:0
            mem-fault-time:40229 usec
            mem-fault-count:31159
        }
    }
}
```

```
network-latency:0 usec
storage-latency:0 usec
```

```
normalized cpu-allocation:sched-allocation {
  min:0
  max:-1
  shares:1000
  minLimit:-1
  units:units: 1 -> mhz
```

```
internal allocation:sched-allocation {
  min:0
  max:72000
  shares:72000
  minLimit:0
  units:units: 2 -> bshares
```

```
effective min:14400 MHz
vtime:18453643423247 vtime
vtime-limit:0 vtime
vtime-aged:2417303293991 vtime
effective-reserved-min:0 MHz
reserved-by-children:0 MHz
avail-to-children:24744 MHz
demand:62 MHz
demand-entitlement-ratio:0
```

## Get the VMX Cartel ID

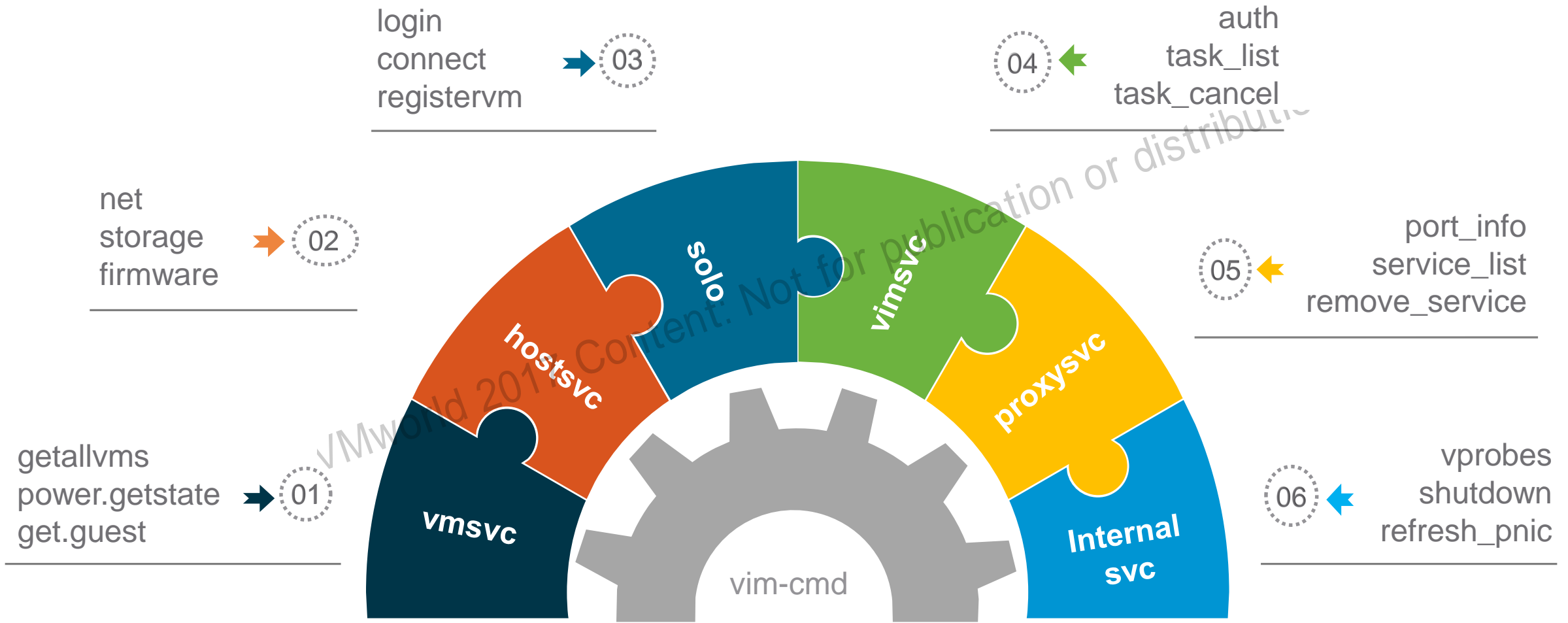
## Get the GroupID

```
ps | grep -E
```

[illegible]

#vsish

### 3. To Manage ESXi & VM Configurations...



## # vim-cmd

Validates if the Hostd  
is running by listing  
the VM's registered

```
[root@is-tse-d128:~] vim-cmd /vmtoolsd/getallvms
```

Vmid	Name	File	Guest OS	Version	Annotation
2	Afeemi	[is-tse-d128-1] Afeemi/Afeemi.vmx	windows7Server64Guest	vmx-11	
3	UNS-PSC	[is-tse-d128-1] UNS-PSC/UNS-PSC.vmx	sles11_64Guest	vmx-08	VMware vCenter Server Appliance
4	Wind07	[is-tse-d128-1] Wind07/Wind07.vmx	windows7_64Guest	vmx-11	
5	New Virtual Machine	[is-tse-d128-1] New Virtual Machine/New Virtual Machine.vmx	wind		

```
[root@is-tse-d128:~]
```

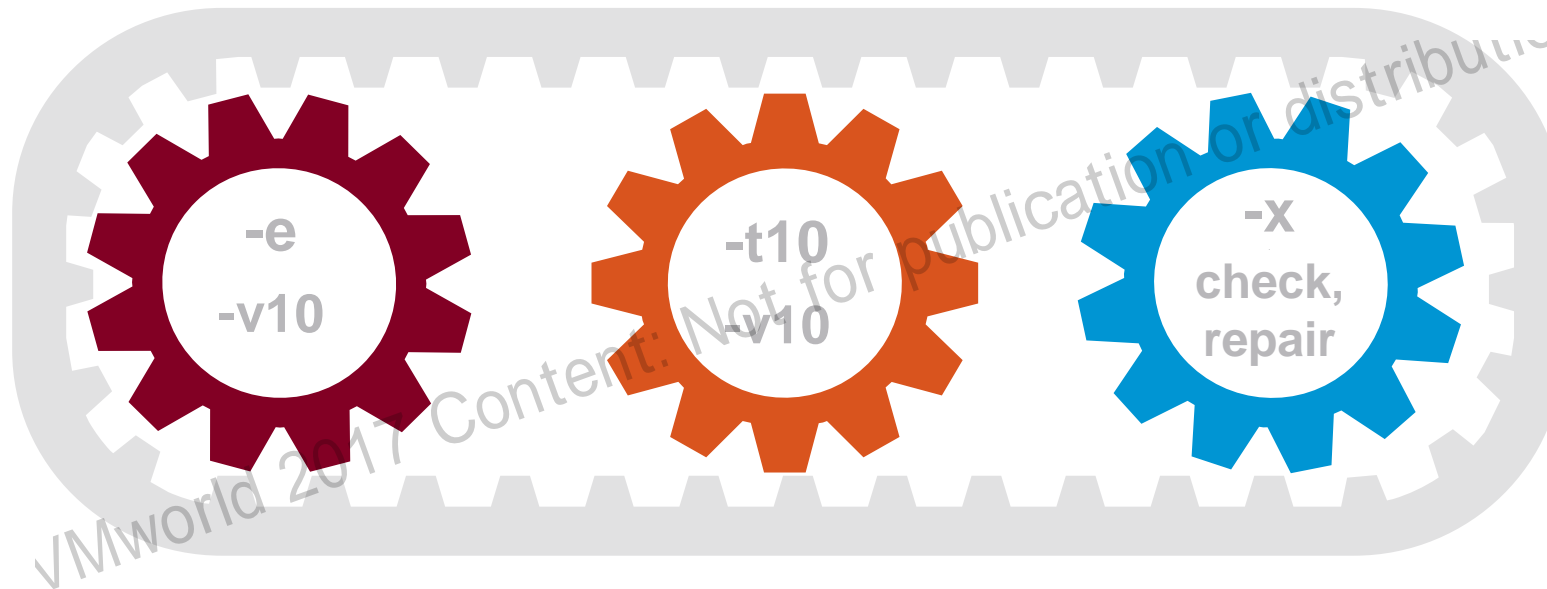
List the tasks running  
on the ESXi host

```
[root@is-tse-d128:~] vim-cmd vimtools/task_list
(ManagedObjectReference) [
  'vim.Task:haTask-5-vim.VirtualMachine.createSnapshot-13083'
  'vim.Task:haTask-5-vim.VirtualMachine.createSnapshot-13084'
]
[root@is-tse-d128:~]
```



## 4. To Manage VMFS Volumes & Virtual Disks...

```
# vmkfstools <opt.1> name.vmdk <opt.2>
```



to check VM  
Snapshot Chain  
consistency like  
PID & CID in  
vmdks

to check Inode  
integrity of a vmdk  
file in VMFS layer  
and not in GOS  
level

to check & correct  
basic file level  
issues of a vmdk  
file in VMFS layer

# # vmkfstools

VM Snapshot Chain  
Consistency check

```
[root@is-tse-d128:/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017] vmkfstools -e Test-VMworld2017-000004.vmdk
Disk link /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000004.vmdk successfully opened.
Disk link /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000003.vmdk successfully opened.
Disk link /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000002.vmdk successfully opened.
Disk link /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000001.vmdk successfully opened.
Cannot establish parent(/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000001.vmdk)-child(/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000002.vmdk) relationship : The parent virtual disk has been modified since the child was created. The content ID of the parent virtual disk does not match the corresponding parent content ID in the child (18)
Parent link description
  Name: /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000001.vmdk
  Create Type: vmfsSparse
  Capacity: 5368709120
  Content ID: 4294967294
  Parent Content ID: 4294967294
Child link description
  Name: /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000002.vmdk
  Create Type: vmfsSparse
  Capacity: 5368709120
  Content ID: 4294967294
  Parent Content ID: 44468
Disk link /vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017/Test-VMworld2017-000002.vmdk
Disk chain is not consistent : The parent virtual disk has been modified since the child was created. The content ID of the parent virtual disk does not match the corresponding parent content ID in the child (18)
[root@is-tse-d128:/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017]
```

Check or Repair  
the Virtual Disk



```
[root@is-tse-d128:/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017] vmkfstool -e Test-VMworld2017-000004.vmdk
Disk is error free
[root@is-tse-d128:/vmfs/volumes/5841338e-8eddf360-ba03-549f3515c866/Test-VMworld2017] █
```

## 5. # memstats – to Get Detailed Memory Statistics

- VM is identified by the VMX cartel ID using the command `ps | grep -i <vmx name>`
- Memstats `-r vm-stats -s name:<choose the options needed>`

```
[root@is-tse-dl28:~] ps | grep -i vmx
1190446 1190446 vmx
1190450 1190446 vmx-vthread-6
1190451 1190446 vmx-vthread-7:UNS-PSC
1190452 1190446 vmx-vthread-8:UNS-PSC
1190453 1190446 vmx-vthread-9:UNS-PSC
1190454 1190446 vmx-mks:UNS-PSC
1190455 1190446 vmx-svga:UNS-PSC
1190456 1190446 vmx-vcpu-0:UNS-PSC
1190457 1190446 vmx-vcpu-1:UNS-PSC
[root@is-tse-dl28:~] memstats -r vm-stats -s name:balloonTgt:ballooned:swapTgt:swapped:memSize:mapped:active

VIRTUAL MACHINE STATS
-----
Start Group ID   : 0
No. of levels    : 12
Unit             : KB
Selected columns : name:memSize:balloonTgt:ballooned:swapTgt:swapped:mapped:active
-----
```

name	memSize	balloonTgt	ballooned	swapTgt	swapped	mapped	active
vm.1190446	4194304	0	0	0	0	4188160	251656
Total	4194304	0	0	0	0	4188160	251656

```
[root@is-tse-dl28:~]
```

Get the VMX cartel ID

Virtual Machine Stats check based on the VMX cartel ID



# # memstats

- VM is identified by the VMX cartel ID using the command `ps | grep -i <vmx name>`
- Memstats `-r swap-stats -s name:<choose the options needed> -u mb`

Swap Statistics on the Virtual Machine

```
[root@is-tse-d128:~] memstats -r swap-stats -s name:isSwapping:swapped:swapIn:swapOut -u mb
```

## VIRTUAL MACHINE SWAP STATS

-----  
Start Group ID : 0  
No. of levels : 12  
Unit : MB  
Selected columns : name:isSwapping:swapped:swapIn:swapOut

name	isSwapping	swapped	swapIn	swapOut
vm.1190446	n	0	0	0
Total		0	0	0





## 6. # pktcap-uw - Network Packet Capture Analysis Tool

- `pktcap-uw --trace -- vmk <vmk port>`
- `pktcap-uw --trace -- uplink <uplink name>`

Output can be redirected to a file as well

```
[root@is-tse-d128:~] pktcap-uw --trace --vmk vmk0 | less
```

```
The trace session is enabled.  
The name of the vmk is vmk0  
No server port specified, select 10866 as the port  
Output the packet info to console.  
Local CID 2  
Listen on port 10866  
Accept...Vsock connection from port 1026 cid 2  
09:31:05.581181[1] Captured at PktFree point, TSO not ena
```

PATH:

```
-- [09:31:05.581021] | TcpipTx  
-- [09:31:05.581052] | PortInput  
-- [09:31:05.581059] | IOChain  
-- [09:31:05.581059] | PreDVFilter  
-- [09:31:05.581060] | PostDVFilter  
-- [09:31:05.581061] | EtherswitchDispath  
-- [09:31:05.581063] | EtherswitchOutput  
-- [09:31:05.581064] | PortOutput  
-- [09:31:05.581066] | IOChain  
-- [09:31:05.581070] | UplinkSndKernel  
-- [09:31:05.581073] | UplinkSnd  
-- [09:31:05.581175] | IOChain
```

Segment[0] ---- 54 bytes:

```
0x0000: 0021 5508 ec40 549f 3515 c864 0800 4510  
0x0010: 0118 5588 4000 4006 c350 0a6d 0a80 0a68  
0x0020: 01a3 0016 c47a 4456 7380 75f6 e73f 5018  
0x0030: 0082 2202 0000
```

Segment[1] ---- 240 bytes:

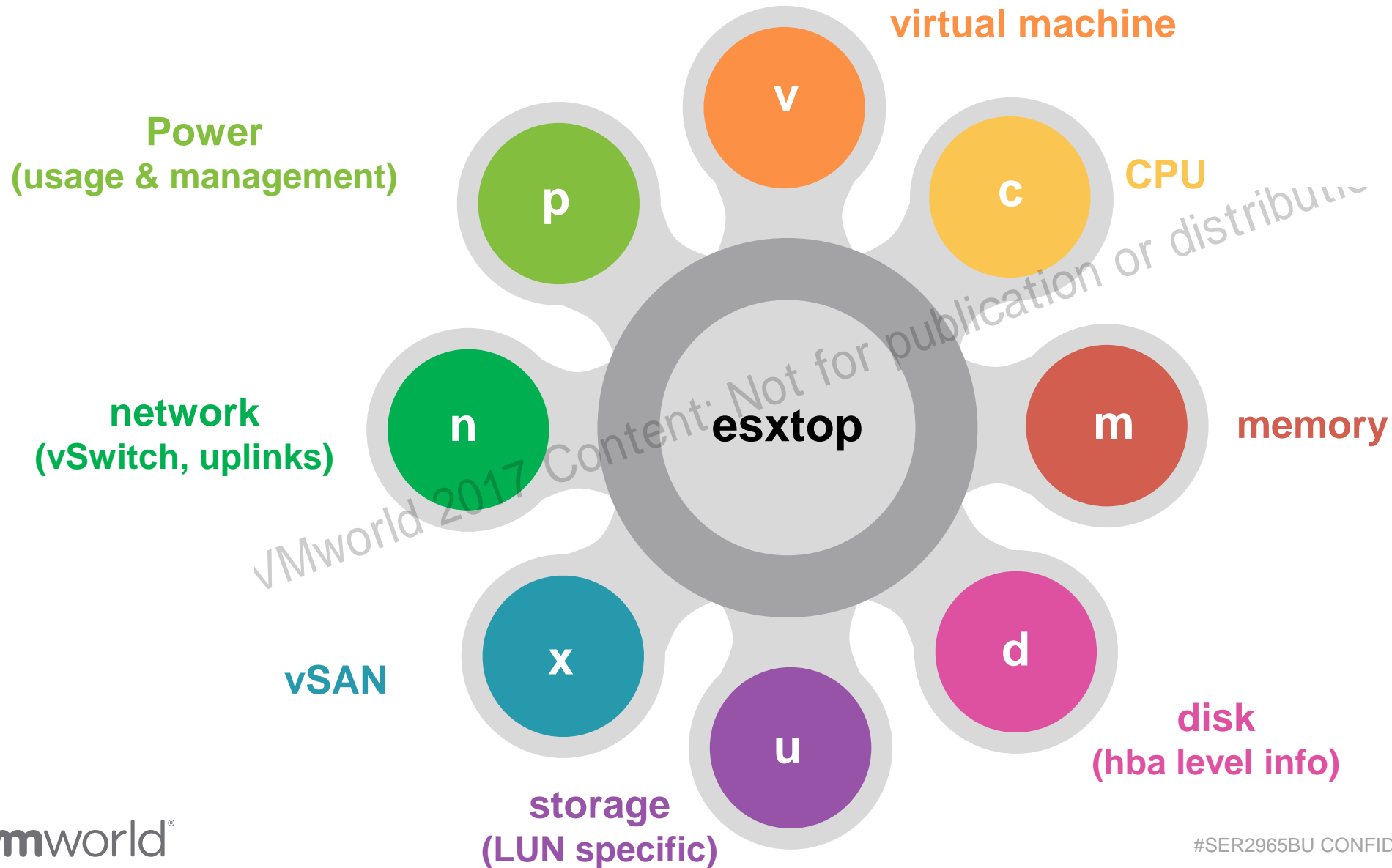
```
0x0030: 9471 2f83 3842 b6ab d491  
0x0040: ba5b 0d18 467f 822a e499 a049 14a8 03d0  
0x0050: 124d 7be0 2c02 4c4a 399b 90fd 8746 14c3  
0x0060: 15a6 alb7 f014 3059 0280 15db 0034 030a  
0x0070: c0e4 f8ec e701 caa9 eee8 f13d 8311 759e  
0x0080: 3dbe fcd f 47bd 91fe bd8c 2df5 218f 643e  
0x0090: f8c2 6d37 cecb 6b7f d00e e46f decc c747  
0x00a0: 5d1a 95fe bf96 d89f 2b46 7d23 dbe5 483b  
0x00b0: 16a3 6b10 10be 76b8 d664 fdca bla8 c145  
0x00c0: 2056 d45b 4a3a 6124 2f4e 79b6 4026 odb9  
0x00d0: 6cd6 993d 64cc 8012 3ab5 243c 9b68 79d5
```

Shows packet traverse path from each layer and to identify drop within the ESXi host

MAC address of the Port that is being captured

# pktcap-uw

## 7. To Monitor Core ESXi Performance...



# # esxtop

1:17:05pm up 28 days 1:17, 627 worlds, 1 VMs, 1 vCPUs; CPU load average: 0.00, 0.00, 0.00

PORT-ID	USED-BY	TEAM-PNIC	DNAME	PKTTX/s	MbTX/s	PSZTX	PKTRX/s	MbRX/s	PSZRX	%DRPTX	%DRPRX
33554433	Management	n/a	vSwitch0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33554434	vmnic0	-	vSwitch0	4.77	0.01	210.00	22.89	0.01	85.00	0.00	0.00
33554435	Shadow of vmnic0	n/a	vSwitch0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33554436	vmk0	vmnic0	vSwitch0	4.77	0.01	210.00	18.31	0.01	76.00	0.00	0.00
50331649	Management	n/a	vSwitch1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50331650	vmnic1	-	vSwitch1	0.19	0.00	60.00	69.24	0.04	84.00	0.00	0.00
50331651	Shadow of vmnic1	n/a	vSwitch1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50331652	vmk1	vmnic1	vSwitch1	0.19	0.00	60.00	0.38	0.00	110.00	0.00	0.00
50331664	920378:New Virtual M	vmnic1	vSwitch1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1:17:33pm up 28 days 1:17, 627 worlds, 1 VMs, 1 vCPUs; CPU load average: 0.01, 0.00, 0.00

ADAPTR	PATH	NPTH	CMDS/s	READS/s	WRITES/s	MBREAD/s	MBWRTN/s	DAVG/cm		
vmhba0	-	1	0.19	0.00	0.19	0.00	0.00	0.00		
vmhba1	-	0	0.00	0.00	0.00	0.00	0.00	0.00		
vmhba2	-	0	0.00	0.00	0.00	0.00	0.00	0.00		
vmhba32	-	0	0.00	0.00	0.00	0.00	0.00	0.00		
vmhba33	-	0	0.00	0.00	0.00	0.00	0.00	0.00		
vmhba34	-	0	0.00	0.00	0.00	0.00	0.00	0.00		0.00
vmhba35	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba36	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba37	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba38	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba39	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba40	-	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba41	-	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vmhba42	-	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



# ESXi – 7 Effective Commands for Troubleshooting

1. **esxcli** : Monitoring or configuring ESXi infra settings
2. **vim-cmd** : Managing ESXi server & Virtual Machine related configurations
3. **vsish** : VMkernel Sys Info Shell
4. **vmkfstools** : for management of VMFS volumes & virtual disks from command line
5. **memstats** : Memory statistics
6. **pktpcap-uw** : An enhanced Network packet capture analysis tool
7. **esxtop** : Real time performance monitoring

# ESXi Configuration Files



# 7 Configuration File

1. **/etc/vmware/esx.conf** : Holds information about Storage, Network and Hardware
2. **/etc/vmware/hostd/vmInventory.xml** : Virtual Machine Inventory list update on the ESXi
3. **/etc/vmware/hostd/authorization.xml** : vCenter to ESXi host connection – authorization
4. **/etc/vmware/vpxa/vpxa.cfg** : vCenter and ESXi connectivity
5. **/etc/vmware/vmkiscsid/iscsid.conf** : iSCSI configuration file
6. **/etc/vmware/fdm** : FDM config file with Clusterconfig, Hostlist and VM metadata
7. **/etc/vmware/license.cfg** : License configuration file for ESXi host

# Q & A





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