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PIN54 - VIOS BEST PRACTICES AND MAINTENANCE

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AGENDA

- Best Practices Setup
- Installation
- Maintenance and Upgrades
- Backup and recovery
- Monitoring
- FBO
- Other
- HMC and Firmware Maintenance
- Wrap-up/Questions
- Backup Material
 - VIOS Advisor Output
 - Useful VIOS and HMC Commands



BEST PRACTICES SETUP

FUNDAMENTALS BEFORE
YOU START



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STAY CURRENT

VIOS Lifecycle

Version	GA	EOM	EOS/EOL
1.5	11/07	2008	09/11
2.1	11/08	2010	09/12
2.2.00	9/10	2011	09/13
2.2.1	10/11	10/12	04/15
2.2.2	10/12	10/13	09/16
2.2.3	4Q13		
2.2.4	2Q15		

Latest release:

2.2.3.3 FP27 SP03

Basically AIX 6100-09-03 -

Requires NIM at 6100-09-03 or 7100-03-03

Can be applied to 2.2.3.0, 2.2.3.1 or 2.2.3.2

Download updates from Fix Central:

<http://www-933.ibm.com/support/fixcentral/>

Download base from entitled software:

<https://www-05.ibm.com/servers/eserver/ess/ProtectedServlet.wss>

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USE FLRT AND CHECK PREREQS

FLRT Home Page:

<http://www14.software.ibm.com/webapp/set2/flrt/home>

VIOS to NIM Master Mapping:

<http://www14.software.ibm.com/webapp/set2/sas/f/flrt/viostable.html>

System Software Maps for VIOS:

<http://www-01.ibm.com/support/docview.wss?uid=ssm1platformvios>

AIX/VIOS Security Tables:

http://www14.software.ibm.com/webapp/set2/sas/f/flrt3/Sec_APARs.html

VIOS Hiper Tables:

http://www14.software.ibm.com/webapp/set2/flrt/doc?page=hiper#vios_hiper

Also check MPIO driver versions as there are specific requirements for each VIO release

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GENERAL

- Keep it simple
- Ensure LMB is the same on all servers if you want to use LPM
- Use hot pluggable adapters rather than built in ones
 - Easier maintenance
- Use dual VIO to allow for concurrent updates
- All adapters should be desired, not required
- Don't mix multipath drivers / HBAs
- **Backup regularly – use NIM or scripts**
- Run HMC Scanner and/or Sysplan before and after all changes
- Plan for at least one update per year (IBM normally puts out 2)
- Separate VIOs for production and non prod on large systems
- Test failover (SEA failover and disk if vio goes down)
- Use VIO commands wherever possible rather than going into oem_setup_env
- mirror vio rootvg
- **Check errpt regularly**
- **NEVER run at 100% entitlement – ensure it is high enough and there are plenty of VPs and memory**
- Run VIOS Advisor regularly
- NOTE – v2 requires at LEAST 30GB in rootvg

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PAGING

Clean up paging

By default VIO has a 512MB hd6 and a 1.5GB paging00 on the same LUN

Swapoff paging00 and delete it

Increase hd6 to 4GB

Reboot

Change from:

lsps -a

Page Space	Physical Volume	Volume Group	Size	%Used	Active	Auto	Type	Chksum
paging00	hdisk0	rootvg	1024MB	18	yes	yes	lv	0
hd6	hdisk0	rootvg	512MB	35	yes	yes	lv	0

TO:

lsps -a

Page Space	Physical Volume	Volume Group	Size	%Used	Active	Auto	Type	Chksum
hd6	hdisk3	rootvg	4096MB	73	yes	yes	lv	0

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SETUP DUMP DEVICES AND LOGGING

Set up dump devices

```
sysdumpdev -e          to get correct size
mklv -y lv_dump1v1 rootvg 32 hdisk3
mklv -y lv_dump1v2 rootvg 32 hdisk2
sysdumpdev -P -p /dev/lv_dump1v1
sysdumpdev -P -s /dev/lv_dump1v2
rm1v lg_dump1v
```

Logging

vi /etc/syslog.conf

```
user.info          /var/adm/lpm/lpm.log rotate size 10m files 2 compress
user.debug         /var/adm/lpm/lpm.dbg rotate size 20m files 8 compress
mail.debug         /usr/local/logs/maillog
*.emerg            /usr/local/logs/syslog
*.alert            /usr/local/logs/syslog
*.crit             /usr/local/logs/syslog
*.err              /usr/local/logs/syslog
auth.notice        /usr/local/logs/syslog
*.info             /usr/local/logs/messages
```

```
cd /usr/local/logs
touch syslog maillog infolog messages
```

```
stopsrc -s syslogd
startsrc -s syslogd
```

Try not to log to /var as bad things happen if it fills up
Make /usr/local/logs a new filesystem

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TUNING

- Make the same tuning changes you would make on AIX
- Set num_cmd_elems and max_xfer_size on the fiber adapters on VIO

```
chdev -l fcs0 -a max_xfer_size=0x200000 -a num_cmd_elems=1024 -P
```

```
chdev -l fcs1 -a max_xfer_size=0x200000 -a num_cmd_elems=1024 -P
```

Check these numbers are supported by your disk vendor

- If NPIV also set on clients
- Client setting cannot be higher than the VIOs
- Pay attention to adapter layout and priorities

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ADAPTER TUNING 1/2

fcs0			
bus_intr_lvl	115	Bus interrupt level	False
bus_io_addr	0xdfc00	Bus I/O address	False
bus_mem_addr	0xe8040000	Bus memory address	False
init_link	al	INIT Link flags	True
intr_priority	3	Interrupt priority	False
lg_term_dma	0x800000	Long term DMA	True
max_xfer_size	0x100000	Maximum Transfer Size	True
(16MB DMA)			
num_cmd_elems	200	Maximum number of COMMANDS to queue to the	
adapter	True		
pref_alpa	0x1	Preferred AL_PA	True
sw_fc_class	2	FC Class for Fabric	True

Changes I often make (test first)

max_xfer_size	0x200000	Maximum Transfer Size	True
128MB DMA area for data I/O			
num_cmd_elems	1024	Maximum number of COMMANDS to queue to	
the adapter	True		

Often I raise this to 2048 – **check with your disk vendor**

lg_term_dma is the DMA area for control I/O

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ADAPTER TUNING 2/2

Check these are ok with your disk vendor!!!

```
chdev -l fcs0 -a max_xfer_size=0x200000 -a num_cmd_elems=1024 -P
chdev -l fcs1 -a max_xfer_size=0x200000 -a num_cmd_elems=1024 -P
```

At AIX 6.1 TL2 VFCs will always use a 128MB DMA memory area even with default max_xfer_size

Remember make changes too both VIO servers and client LPARs if using NPIV
VIO server setting must be at least as large as the client setting

See Dan Braden Techdoc for more on tuning these:

<http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD105745>

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MY VIO SERVER AND NPIV CLIENT ADAPTER SETTINGS

VIO SERVER

```
#lsattr -El fcs0
```

lg_term_dma	0x800000	Long term DMA	True
max_xfer_size	0x200000	Maximum Transfer Size	True
num_cmd_elems	2048	Maximum number of COMMANDS to queue to the adapter	True

NPIV Client (running at defaults before changes)

```
#lsattr -El fcs0
```

lg_term_dma	0x800000	Long term DMA	True
max_xfer_size	0x200000	Maximum Transfer Size	True
num_cmd_elems	2048	Maximum Number of COMMAND Elements	True

NOTE NPIV client must be <= to settings on VIO

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ADAPTER PRIORITIES AFFECT PERFORMANCE

Power 770 Layout		9117-MMC																			
CEC	Top		123456 has GX cables		Bottom		2468ab				5877 pcie only I/O Drawer 123487										
	Slot	Desc	Pri	Alloc	Slot	Desc	Pri	Alloc	Slot	Desc	Pri	Alloc	IOC								
	C1	8GB DP fibre	1	lpar1	C1	8GB DP fibre	1	lpar1	C1	8GB DP fibre	1	vio1	1								
	C2	4PT 10/100/1000	3	lpar1	C2	4PT 10/100/1000	3	lpar1	C2	4PT 10/100/1000	3		1								
	C3	8GB DP fibre	5	vio2	C3	8GB DP fibre	5	vio1	C3		5		1								
	C4	4PT 10/100/1000	6	vio2	C4	4PT 10/100/1000	6	vio1	C4	8GB DP fibre	2	vio2	2								
	C5	8GB DP fibre	2	vio1	C5	8GB DP fibre	2	vio2	C5	4PT 10/100/1000	4		2								
	C6	4PT 10/100/1000	4	vio1	C6	4PT 10/100/1000	4	vio2	C6	4GB DP fibre	6	lpar1	2								
									C7	4GB DP fibre	7		3								
	D1	146GB disk		vio1	D1	146GB disk		vio1	C8		8		3								
	D4	146GB disk		vio2	D4	146GB disk		vio2	C9		9		3								
									C10		10		3								

Check the various Technical Overview Redbooks at <http://www.redbooks.ibm.com/>

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MEMORY PLANNING

<http://www.circle4.com/ptechu/memoryplan.xlsx>

Memory Planning Worksheet										This gives a rough estimate			
Power7 770										Assumes LMB size is 256MB			
Max RAM Capacity	786432	Ram installed	393216	Ram Active	131072	Each active IVE port adds 102 MB							
		GB	384		LMB below in MB								
Change the LMB size on this line to match MRO on HMC										256 Used the largest to show worst possible			
		Extra high performance	ports per VIO	8 NPV VFCs per VIO	12	Extra high if NPV							
LPAR	Desired	Maximum	OH/LMB	Roundup	Actual	Memory	Memory	Perf	ports				
NAME	Memory	Memory	MB	OH	OH * LMB	Needed	Needed						
	MB	MB	Div 64	MB	MB								
VIOS1	3172	4096	64	0.25	1	256		4096	1680				
VIOS2	3172	4096	64	0.25	1	256		4096	1680				
LPAR1	12032	16384	256	1.00	1	256							
LPAR2	20224	24576	384	1.50	2	512							
LPAR3	14336	16384	256	1.00	1	256							
LPAR7	17152	17152	268	1.05	2	512							
LPAR8	65536	71680	1120	4.38	5	1280							
LPAR9	32768	36864	576	2.25	3	768							
HYPERSVISOR						768							
IVE						102							
I/O drawer (I use 512 per 2)						512							
Safety Net						512							
MB Total													
MB Total	168392	191232	2988	11.671875	16	5990	174382	8192	3360				
GB Total	164					5.85	170	8.00	3.28				
GB Total													
Hypervisor requires 6GB minimum for overhead with these settings						Add High Perf							
LPARs require 164GB so the total active needed is at least 170GB						Or add NPV							
Need to add NPV and high speed adapter memory needs as well - could be 178GB													
Look at AME potential as well													
8GB and 10GB extra high performance adapters													
For each active port add 512MB													
If NPV then 140MB per VFC adapter per client													
i.e. 20 ports per VIO without NPV would be 20 * 512 = 10GB plus VIOS base for each VIOS													
if NPV then we allocate per client so if there are 20 clients on each VIO then each													
VIO needs 20 * 140 = 2.8GB above the base													

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NETWORK



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VIRTUAL ETHERNET

Link aggregation

Put vio1 aggregate on a different switch to vio2 aggregate
 Provides redundancy without having to use NIB
 Allows full bandwidth and less network traffic (NIB is pingy)
 Basically SEA failover with full redundancy and bandwidth

Pay attention to entitlement

VE performance scales by entitlement not VPs

If VIOS only handling network then disable network threading on the virtual Ethernet

`chdev -dev ent? thread=0`

Turn on large send on VE adapters

`chdev -dev ent? -attr large_send=yes`

Turn on large send on the SEA

`chdev -dev entx -attr largesend=1`

NOTE do not do this if you are supporting Linux or IBM i LPARs with the VE/SEA

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STARTER SET OF TUNABLES NETWORK

Typically we set the following:

```
NETWORK
no -p -o rfc1323=1
no -p -o tcp_sendspace=262144
no -p -o tcp_recvspace=262144
no -p -o udp_sendspace=65536
no -p -o udp_recvspace=655360
```

Also check the actual NIC interfaces and make sure they are set to at least these values
You can't set `udp_sendspace > 65536` as IP has an upper limit of 65536 bytes per packet

Check `sb_max` is at least 1040000 – increase as needed

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My VIO SERVER SEA

```
# ifconfig -a
en6:
flags=1e080863,580<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MULTIC
AST,GROUPRT,64BIT,CHECKSUM_OFFLOAD(ACTIVE),CHAIN>

    inet 192.168.2.5 netmask 0xfffff00 broadcast 192.168.2.255
    tcp_sendspace 262144 tcp_recvspace 262144 rfc1323 1

lo0:
flags=e08084b,1c0<UP,BROADCAST,LOOPBACK,RUNNING,SIMPLEX,MULTICAST
,GROUPRT,64BIT,LARGESEND,CHAIN>
    inet 127.0.0.1 netmask 0xff000000 broadcast 127.255.255.255
    inet6 ::1%1/0
    tcp_sendspace 131072 tcp_recvspace 131072 rfc1323 1
```

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NETWORK PERFORMANCE AND THROUGHPUT

Depends on:

- Available CPU power
 - **Scales by entitlement not by VPs**
- MTU size
- Distance between receiver and sender
- Offloading features
- Coalescing and aggregation features
- TCP configuration
- Firmware on adapters and server
- Ensuring all known fixes are on for 10GbE issues

Network Performance Presentation at:

<http://youtu.be/8pth2ujGWK0>

<http://www.circle4.com/movies/networkperf/networkperf.pdf>

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VIO 2.2.3 SEA CHANGES

Traditional SEA setup

Ent4 is the virtual adapter defined at the HMC with external access
(SEA goes here)

VIO1 is priority 1 and VIO2 is priority 2

Ent5 is the virtual adapter on Vlan 1 with no external
(IP will go here)

Ent6 is the control channel on vlan 255

`mkvdev -sea ent0 -vadapter ent4 -default ent4 -defaultid 1 -attr ha_mode=auto ctl_chan=ent6`
Creates ent7 as the SEA

Do not mess up priorities or ctl_chan or you will cause a spanning tree loop

Update with 2.2.3

See chapter 4 of SG248198- Redbook on 2.2.3 Enhancements

SEA setup has been simplified

Requirement removed for dedicated control channel and VLAN ID for each SEA failover configuration

Multiple SEA pairs can now share VLAN 4095 within the same virtual switch and no ctl_chan is needed

HMC (>= 7.8) reserves 4095 for internal management traffic

Requires VIOS 2.2.3, HMC 7.7.8 and firmware 780 or higher

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INSTALLATION



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INSTALL OPTIONS

From DVD – complete install

Using NIM

<http://www-01.ibm.com/support/docview.wss?uid=isg3T1011386>

Using HMC - check vios install box

Commandline - installios:

http://www-01.ibm.com/support/knowledgecenter/POWER7/p7hb1/iphb1_vios_configuring_installhmc.htm?cp=POWER7%2F14-8-0-2-2-1-1

GUI:

<http://ibmsystemsmag.blogs.com/aixchange/2013/05/vios-installation-via-gui.html>

From a mksysb

http://pic.dhe.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.psm.resources.doc%2Fvios%2Fsdmc_vios-vios_backup_restore_file_nim.html

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VIOS AND NIM

Use of NIM to back up, install, and update the VIOS is supported.

Note: For install, always create the SPOT resource directly from the VIOS **mksysb** image. Do **NOT** update the SPOT from an LPP_SOURCE.

Use of NIM to update the VIOS is supported as follows:

Ensure that the NIM Master is at the appropriate level to support the VIOS image.

<http://www14.software.ibm.com/webapp/set2/sas/f/flrt/viostable.html>

On the NIM Master, use the operation **updateios** to update the VIOS Server.

"nim -o updateios -a lpp_source=lpp_source1"

On the NIM Master, use the operation **alt_disk_install** to update an alternate disk copy of the VIOS Server.

**"nim -o alt_disk_install -a source=rootvg -a disk=target_disk
-a fix_bundle=(Value)"**

If NIM is not used to update the VIOS, only the **updateios** or the **alt_root_vg** command from the padmin shell can be used to update the VIOS.

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VIOS AND NIM

Add VIOS partition as a NIM client

Copy the VIOS mksysb image from the CD to your NIM master

- On VIOS 2.2 media there are 3 images now – the 3rd is on DVD 2
 - Copy all 3 images individually to a directory and then use cat to combine them
- ```
cat /export/mksysb/vios2.2/mksysb_image /export/mksysb/vios2.2/mksysb_image2
/export/mksysb/vios2.2/mksysb_image3 >/export/mksysb/nim_vios2.2mksysb
```

Define mksysb resource to NIM master

Define spot on NIM master

- The source for the SPOT will be the combined mksysb
- The SPOT CANNOT be created from an LPP\_Source

Copy the bosinst.data from the DVD and create a viosbosinst resource

You can now use bos\_inst to do a mksysb install once the partition profile is defined

<http://www-01.ibm.com/support/docview.wss?uid=isg3T1011386>

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## MAINTENANCE AND UPGRADES



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## UPDATING VIOS

1. Normally upgrade HMC first then firmware then VIOS and then AIX
2. BUT – check the readme for all of the above first to make sure there is not a different required order
3. Download the updates and cross-check compatibility using FLRT
4. Read the readme again
5. Run errpt to check for problems, check there are no stale partitions, missing disks or paths, etc
  - lsvg rootvg checks for stale PPs and physical volumes.
  - lsvg -p rootvg looks for missing disks.
  - lspath - checks for missing paths.
  - errpt checks for errors.
6. Ensure all paths on clients are redundant so LPARs will stay up when this VIOS is rebooted
7. Run HMC Scanner or sysplan to document prior to changes
8. Backup the VIOS
9. Mount the NFS filesystem or DVD or FBO image to be used for update

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## MIGRATION 1/2

Back the VIO up before doing anything and again when done!

1. In order to migrate to v2.\* your HMC must be at v7 or later at least 7.7.4  
If VIOS is lower than v2.1 then you must migrate to 2.0.0 using the migration DVD
2. Migrating from prior to v1.3  
Basically this is a reinstall
3. Migrating from v1.3 or v1.4  
Need the migration DVD for VIOS 1.5 or the updates  
Need to update to VIOS 1.5.2.6-FP-11.1 SP-02 prior to upgrade to v2
4. Migrating from v1.5.2.6-FP-11.1 SP-02 or higher  
Need the migration DVD for VIOS v2  
Boot from the DVD in SMS mode and tell it to do a migration upgrade

**Note – once at v2.1 you need to update to 2.2.3.1 prior to applying 2.2.3.3**  
**2.2.3.3 requires a minimum release of 2.2.3.0 in order to be applied**  
**Single step update requires VIO between 2.2.1.1 and 2.2.2.x**  
**NIM allows you to create a single merged lpp\_source to get around this but cannot be used with SDDPCM**

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## MIGRATION 2/2

5. See Power VM Managing and Monitoring Redbook – Chapter 11  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg247590.pdf>

NOTE IBM has a simplified migration offering  
[http://www.ibmsystemsmag.com/ibmi/trends/ibmannouncements/vios\\_migration/](http://www.ibmsystemsmag.com/ibmi/trends/ibmannouncements/vios_migration/)

Once you are on v2.1 then upgrades are all done using updateios  
 There are specific concerns around updates if you are running SSPs (Shared storage pools)

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## UPDATING VIOS WITH FIXPACKS OR SPs

From 2.2.3.2 to 2.2.3.3  
 As padmin run "updateios -commit" to ensure any uncommitted updates are committed  
 Check to ensure there are no missing filesets prior to updates

```
$ ioslevel
2.2.3.2
$ updateios -commit
All updates have been committed.
```

```
$ oem_setup_env
/usr/sbin/emgr -P
There is no efix data on this system.
```

Now run checks

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## PRE INSTALL CHECKS FOR VIOS 2.2.3.2 TO 2.2.3.3 UPDATE

```
Did VIO2 (secondary VIO first):
$ ioslevel
2.2.3.2
$ oem_setup_env
#df -g - make sure no filesystems are full
#oslevel -s
6100-09-02-1412
instfix -i | grep ML
 All filesets for 6.1.0.0_AIX_ML were found.
 All filesets for 6100-00_AIX_ML were found.
 All filesets for 6100-01_AIX_ML were found.
 All filesets for 6100-02_AIX_ML were found.
 All filesets for 6100-03_AIX_ML were found.
 All filesets for 6100-04_AIX_ML were found.
 All filesets for 6100-05_AIX_ML were found.
 All filesets for 6100-06_AIX_ML were found.
 All filesets for 6100-07_AIX_ML were found.
 All filesets for 6100-08_AIX_ML were found.
 All filesets for 6100-09_AIX_ML were found.
lppchk -v
lppchk -vm3
oslevel -s -l 6100-09-02-1412
#errpt | more - check there are no errors
```

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### CONTINUE 2.2.3.3 UPDATE BACKUP 1/2

```
Back it up:
./save-viostuff.sh
mkdir: 0653-358 Cannot create /home/padmin/saveit.
/home/padmin/saveit: Do not specify an existing file.

ls -l /home/padmin/saveit
total 824
-rw-r--r-- 1 root staff 118 Jul 22 12:33 b740vio2.disktmp.txt
-rw-r--r-- 1 root staff 24 Jul 22 12:33 b740vio2.ioslevel.txt
-rw-r--r-- 1 root staff 16 Jul 22 12:33 b740vio2.oslevel.txt
-rw-r--r-- 1 root staff 8038 Jul 22 12:33 b740vio2.vioadapter.txt
-rw-r--r-- 1 root staff 4528 Jul 22 12:33 b740vio2.viodisk.txt
-rw-r--r-- 1 root staff 59593 Jul 22 12:33 b740vio2.viodisks.txt
-rw-r--r-- 1 root staff 8800 Jul 22 12:33 b740vio2.violsdevv.txt
-rw-r--r-- 1 root staff 11967 Jul 22 12:33 b740vio2.violsmapall.npiov.txt
-rw-r--r-- 1 root staff 19363 Jul 22 12:33 b740vio2.violsmapall.txt
-rw-r--r-- 1 root staff 4595 Jul 22 12:33 b740vio2.vioslots.txt
-rw-r--r-- 1 root staff 227944 Jul 22 12:33 b740vio2.viovpd.txt
-rw-r--r-- 1 root staff 37 Jul 22 12:33 cfgname.txt
-rw-r--r-- 1 root staff 0 Jul 22 12:33 entstat.txt
-rw-r--r-- 1 root staff 240 Jul 22 12:33 firewall.txt
-rw-r--r-- 1 root staff 652 Jul 22 12:33 hostmap.txt
-rw-r--r-- 1 root staff 5970 Jul 22 12:33 optimize.txt
-rw-r--r-- 1 root staff 713 Jul 22 12:33 routinfo.txt
-rw-r--r-- 1 root staff 240 Jul 22 12:33 user.txt
-rw-r--r-- 1 root staff 15071 Jul 22 12:33 view.txt
```

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### CONTINUE 2.2.3.3 UPDATE BACKUP 2/2

```
$ viosbr -backup -file /home/padmin/saveit/b740vio2-backup
Backup of this node (b740vio2) successful

oem_setup_env
mount /usr/local/backups
su - padmin -c "ioscli backupios -file /usr/local/backups/b740vio2-jul2214.mksysb -mksysb"
/usr/local/backups/b740vio2-jul2214.mksysb doesn't exist.
Creating /usr/local/backups/b740vio2-jul2214.mksysb
*** Here it is doing a savevgstructs for rootclients_vg *****
Creating information file for volume group rootclients_vg.
Creating list of files to back up.
Backing up 6 files
6 of 6 files (100%)
0512-038 savevg: Backup Completed Successfully.
Backup in progress. This command can take a considerable amount of time
to complete, please be patient...

Creating information file (/image.data) for rootvg.
Creating list of files to back up.
Backing up 160374 files.....
39229 of 160374 files (24%).....
160374 of 160374 files (100%)
0512-038 savevg: Backup Completed Successfully.
```

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### CONTINUE 2.2.3.3 UPDATE INSTALL 1/3

Download from Fix Central the iso image for 2.2.3.3 – I do this to my NIM server  
 It came down as H52175995.iso  
 mkdir /cdrom  
 loopmount -i H52175995.iso -o "-V cdrfs -o ro" -m /cdrom  
 smitty bffcreate – I do this on my NIM server and create a directory to put the files in that the VIO has access to  
 In this case /usr/local/soft/vios2233

Normally I copy the files locally to the VIO in case I lose the network during the install

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### CONTINUE 2.2.3.3 UPDATE INSTALL 2/3

Now on the VIO:  
 \$ updateios -accept -install -dev /usr/local/soft/vios2233

\*\*\*\*\*  
 installp PREVIEW: installation will not actually occur.  
 \*\*\*\*\*

+-----+  
 | Pre-installation Verification... |  
 +-----+

Verifying selections...done  
 Verifying requisites...done  
 Results...  
 SUCCESSES  
 -----

Filesets listed in this section passed pre-installation verification and will be installed.  
 Mandatory Fileset Updates  
 -----  
 (being installed automatically due to their importance)  
 bos.rte.install 6.1.9.16 # LPP Install Commands  
 << End of Success Section >>

**Prompts you to reply Y which you do and it installs them**

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### CONTINUE 2.2.3.3 UPDATE INSTALL 3/3

After bos.rte.install is installed it then prompts you re installing the other 272 fixes  
Check estimated space needed and free space and if all is good then:  
Reply Y and they begin installing – takes about 2 hours depending

```
$ioslevel
Shows as 2.2.3.3
```

```
$oem_setup_env
oslevel -s
6100-09-03-1415
```

```
lspv | grep rootvg
hdisk0 00f6934cc34a30f3 rootvg active
hdisk1 00f6934c30e34699 rootvg active
```

```
bosboot -a -d hdisk0
bosboot -a -d hdisk1
bootlist -m normal hdisk0 hdisk1
```

**Now reboot and then run post install tests**

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### POST INSTALL CHECKS

```
$ ioslevel
2.2.3.3
$ oem_setup_env

oslevel -s
Should show: 6100-09-03-1415
6100-09-03-1415
instfix -i | grep ML
All filesets for 6100-00_AIX_ML were found.
All filesets for 6100-01_AIX_ML were found.
All filesets for 6100-02_AIX_ML were found.
All filesets for 6100-03_AIX_ML were found.
All filesets for 6100-04_AIX_ML were found.
All filesets for 6100-05_AIX_ML were found.
All filesets for 6100-06_AIX_ML were found.
All filesets for 6100-07_AIX_ML were found.
All filesets for 6.1.0.0_AIX_ML were found.
All filesets for 6100-08_AIX_ML were found.
All filesets for 6100-09_AIX_ML were found.
lppchk -v
lppchk -vm3
oslevel -s -l 6100-09-03-1415
#errpt | more – check there are no errors
```

**Once all checks are passed and VIO2 is back up then go do the same upgrade to VIO1**

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## UPDATING VIOS PROBLEMS

```
oem_setup_env
oslevel -s
6100-00-00-0000
instfix -i | grep ML
 All filesets for 6100-07_AIX_ML were found.
 All filesets for 6.1.0.0_AIX_ML were found.
 Not all filesets for 6100-08_AIX_ML were found.
This means there are missing filesets
oslevel -sq
Known Service Packs

6100-08-02-1316
6100-08-01-1245

oslevel -s -l 6100-08-02-1316
Fileset Actual Level Service Pack Level

bos.alt_disk_install.boot_images 6.1.8.0 6.1.8.15
bos.loc.utf.ES_ES 6.1.7.15 6.1.8.15
```

These filesets should be corrected prior to updating  
Either use updateios to update them or to remove them

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## REMOVE OR UPDATE PROBLEM FILESETS

DO NOT USE SMITTY – use updateios

Issues with bos.suma  
updateios –remove bos.suma

```
oslevel -s -l 6100-08-02-1316
Fileset Actual Level Service Pack Level

bos.alt_disk_install.boot_images 6.1.8.0 6.1.8.15
bos.loc.utf.ES_ES 6.1.7.15 6.1.8.15
```

updateios –remove bos.loc.utf.ES\_ES

Upgrade alt disk  
Copy images to be updated into a directory (/usr/local/soft/missing)  
Run inutoc .

updateios –commit  
Updateios -accept -install -dev /usr/local/soft/missing

Also remove efixes prior to updates:  
/usr/sbin/emgr -P lists them

To remove:  
# /usr/sbin/emgr -r -L <EFIX label>  
emgr -r -L IV46869m3a

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## BACKUP AND RECOVERY



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## BACKING UP VIOS

Use viosbr to backup user defined virtual resources on the VIO

Make sure to save that backup in rootvg

- `viosbr -backup -file /tmp/viosabkupbr`
- You can also use viosbr to view or restore
- <http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hcg/viosbr.htm>

Mount NFS filesystem to backup to (in my case /backups)

`mkdir /backups/viosa`

Then as padmin:

`backupios -file /backups/viosa`

The above creates a `nim_resources.tar` package in that directory and it can be used to clone VIO servers

You can also back it up as a `mksysb` file that is easy to restore from the NIM server

`backupios -file /backups/viosa.mksysb -mksysb`

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## BACKING UP VIOS FROM ROOT

As root run viosave.sh (see next slide)

lsvg – if you have other VGs i.e. datavg then for each .....

su - padmin -c "ioscli savevgstruct datavg"

su - padmin -c "ioscli viosbr –backup –file /tmp/viosabr.backup"

Mount the NFS repository for the backups (/nfsmnt)

su – padmin –c “ioscli backupios –file /nfsmnt/vio2-jul2114.mksysb -mksysb”

This backs it up to a bootable mksysb file

If using NIM to clone VIO servers don't forget:

su – padmin –c “ioscli backupios -file /nfsmnt/nimbkups”

This creates a nim\_resources.tar file that can be used for restores described at:

[http://public.dhe.ibm.com/software/server/vios/docs/backupios\\_mod.pdf](http://public.dhe.ibm.com/software/server/vios/docs/backupios_mod.pdf)

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## DOCUMENT VIO INFORMATION – VIOSAVE.SH

```
#!/bin/sh
#
day="/bin/date +%d"
month="/bin/date +%m"
year="/bin/date +%y"
set -- Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
shift $month
lmonth="$1"
machine=$(uname -n)
directory="/bin/date +%m%d%Y_%H%M"
machine_directory=$(printf "%s_%s" $machine $directory)
mkdir /home/padmin/saveit
cd /home/padmin/saveit
logit="/home/padmin/saveit/$machine"
logit1="/home/padmin/saveit/$machine"
su - padmin -c "ioscli ioslevel" >>$logit1.ioslevel.txt
su - padmin -c "ioscli lsdev -type disk" >>$logit1.viodisk.txt
su - padmin -c "ioscli lsdev -type adapter" >>$logit1.vioadapter.txt
su - padmin -c "ioscli lsdev -vpd" >>$logit1.viovpd.txt
su - padmin -c "ioscli lsdev -slots" >>$logit1.vioslots.txt
su - padmin -c "ioscli lsmapi -all" >>$logit1.viosmapall.txt
su - padmin -c "ioscli lsmapi -all -npiv" >>$logit1.viosmapall.npiv.txt
su - padmin -c "ioscli lsdev -virtual" >>$logit1.viosdevv.txt
su - padmin -c "ioscli cfnamesrv -ls" >>cfname.txt
su - padmin -c "ioscli entstat -all ent9" >>entstat.txt
su - padmin -c "ioscli hostmap -ls" >>hostmap.txt
su - padmin -c "ioscli lsuser" >>user.txt
su - padmin -c "ioscli netstat -routinfo" >>routinfo.txt
su - padmin -c "ioscli optimize -list" >>optimize.txt
su - padmin -c "ioscli viosecure -firewall view" >>firewall.txt
su - padmin -c "ioscli viosecure -view -nonint" >>view.txt
oslevel -s >>$logit1.oslevel.txt
getlvdm -C >>$logit1.diskmp.txt
while read label line
do
echo "n" >>$logit1.viodisks.txt
echo "Hdisk is $label" >>$logit1.viodisks.txt
echo " " >>$logit1.viodisks.txt
su - padmin -c "ioscli lsdev -dev $label -attr" >>$logit1.viodisks.txt
done <$logit1.diskmp.txt"
#
exit 0
```

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## MONITORING



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## CPU AND MEMORY

Remember VIO scales by entitlement not VPs  
Ensure sufficient entitlement  
Watch for VCSWs – this is a sign of entitlement shortage  
If running close to entitlement on average increase entitlement  
If running close to VPs on average increase entitlement and VPs  
Consider running dedicated

NEVER EVER let your VIO server page  
Clean up the VIO server page spaces

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## NMON MONITORING

**nmon -ft -AOPV^dMLW -s 15 -c 120**

- Grabs a 30 minute nmon snapshot
- A is async IO
- M is mempages
- t is top processes
- L is large pages
- **O is SEA on the VIO**
- P is paging space
- V is disk volume group
- d is disk service times
- ^ is fibre adapter stats
- W is workload manager statistics if you have WLM enabled

If you want a 24 hour nmon use:

**nmon -ft -AOPV^dMLW -s 150 -c 576**

May need to enable accounting on the SEA first – this is done on the VIO  
chdev -dev ent\* -attr accounting=enabled

Can use entstat/seastat or topas/nmon to monitor – this is done on the vios  
topas -E  
nmon -O

VIOS performance advisor also reports on the SEAs

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## SHARED PROCESSOR POOL MONITORING

Turn on "Allow performance information collection" on the LPAR properties  
This is a dynamic change

topas -C

Most important value is app – available pool processors  
This represents the current number of free physical cores in the pool

nmon option p for pool monitoring

To the right of PoolCPUs there is an unused column which is the number of free  
pool cores

nmon analyser LPAR Tab

lparstat

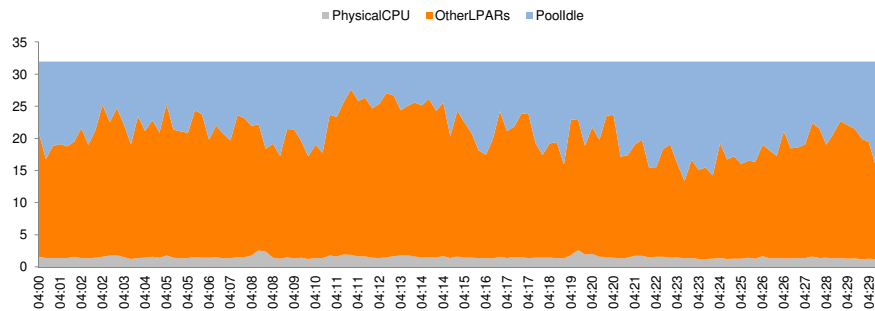
Shows the app column and poolsize

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## NMON ANALYSER LPAR TAB

### Shared Pool Utilisation - b750nl1 10/4/2013



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## NETSTAT -V VIO

### SEA

#### Transmit Statistics:

Packets: 83329901816  
 Bytes: 87482716994025  
 Interrupts: 0  
 Transmit Errors: 0  
 Packets Dropped: 0

Max Packets on S/W Transmit Queue: 374  
 S/W Transmit Queue Overflow: 0  
 Current S/W+H/W Transmit Queue Length: 0

Elapsed Time: 0 days 0 hours 0 minutes 0 seconds  
 Broadcast Packets: 1077222  
 Multicast Packets: 3194318  
 No Carrier Sense: 0  
 DMA Underrun: 0  
 Lost CTS Errors: 0  
 Max Collision Errors: 0

#### Receive Statistics:

Packets: 83491933633  
 Bytes: 87620268594031  
 Interrupts: 18848013287  
 Receive Errors: 0  
**Packets Dropped: 67836309**  
 Bad Packets: 0

Broadcast Packets: 1075746  
 Multicast Packets: 3194313  
 CRC Errors: 0  
 DMA Overrun: 0  
 Alignment Errors: 0  
**No Resource Errors: 67836309 check those tiny, etc Buffers**

#### Virtual I/O Ethernet Adapter (I-lan) Specific Statistics:

Hypervisor Send Failures: 4043136  
 Receiver Failures: 4043136  
 Send Errors: 0  
**Hypervisor Receive Failures: 67836309**

"No Resource Errors" can occur when the appropriate amount of memory can not be added quickly to vent buffer space for a workload situation.  
 You can also see this on LPARs that use virtual Ethernet without an SEA

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## BUFFERS

### Virtual Trunk Statistics

#### Receive Information

| Buffer Type          | Tiny | Small | Medium | Large | Huge |
|----------------------|------|-------|--------|-------|------|
| <b>Min Buffers</b>   | 512  | 512   | 128    | 24    | 24   |
| <b>Max Buffers</b>   | 2048 | 2048  | 256    | 64    | 64   |
| Allocated            | 513  | 2042  | 128    | 24    | 24   |
| Registered           | 511  | 506   | 128    | 24    | 24   |
| History              |      |       |        |       |      |
| <b>Max Allocated</b> | 532  | 2048  | 128    | 24    | 24   |
| Lowest Registered    | 502  | 354   | 128    | 24    | 24   |

"Max Allocated" represents the maximum number of buffers ever allocated

"Min Buffers" is number of pre-allocated buffers

"Max Buffers" is an absolute threshold for how many buffers can be allocated

```
chdev -l <veth> -a max_buf_small=4096 -P
```

```
chdev -l <veth> -a min_buf_small=2048 -P
```

Above increases min and max small buffers for the virtual ethernet adapter configured for the SEA above

**Needs a reboot**

Max buffers is an absolute threshold for how many buffers can be allocated

Use entstat -d (-all on vio) or netstat -v to get this information

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## FBO – FILE BACKED OPTICAL



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## FBO

Provides ISO image access to LPARs connected to the VIO  
 Uses vSCSI  
 Add third disk to one of the VIO servers and put in its own VG  
 Use that VG as the repository  
 Rip DVDs to ISO images (or download the ISOs)  
 Can also put mksysb images in the repository

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## USING FBO

***So using hdisk2 as my third disk I create a VG:***

```
mkvg -y datavg hdisk2
mkrep -sp datavg -size 10G
```

***This can be increased later and creates:***

```
/dev/VMLibrary 10.00 5.85 42% 7 1% /var/vio/VMLibrary
```

***We can now load images into the repository from an ISO we have on NFS:***

```
mkvopt -name rhelboot64 -file /usr/local/nfsmnt/rhel-64bit-basedvd.iso
```

***This takes the ISO and copies it as follows:***

```
$ ls -l /var/vio/VMLibrary
-rw----- 1 root staff 237981696 Jul 25 13:14 rhelboot64
```

***To list the repository:***

```
$ lsrep
```

| Size(mb)   | Free(mb)  | Parent Pool | Parent Size | Parent Free |
|------------|-----------|-------------|-------------|-------------|
| 10199      | 5989      | datavg      | 279552      | 157696      |
| Name       | File Size | Optical     | Access      |             |
| rhelboot64 | 227       | None        | rw          |             |

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## USING FBO

**In order to use the repository, the virtual host has to be assigned a virtual SCSI FBO adapter; do so with:**

```
mkvdev -fbo -vadapter vhost0
vtopt0 available
```

**Multiple vtopt devices for a client can be created, if desired.**

**Now make the image available to vtopt0:**

```
loadopt -vtd vtopt0 -disk rhelboot64
loadopt -disk p8aix71base1 -vtd vtopt0
```

**This example would mount rhelboot64 or p8aix71base1 as if it were a local CD. To unmount it, use:**

```
unloadopt -vtd vtopt0
```

Also, **rmvopt** removes an image; **rmrep** removes a repository; and **lsvopt** lists the state of the vtopts:

```
$ lsvopt
VTD Media Size(mb)
vtopt0 No Media n/a
```

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## MY POWER8 VIO FBO

```
$ lsrep
Size(mb) Free(mb) Parent Pool Parent Size Parent Free
511414 490594 fbovg 1089024 577024
```

| Name         | File Size | Optical | Access |
|--------------|-----------|---------|--------|
| p8aix61base1 | 4423      | None    | rw     |
| p8aix61base2 | 2265      | None    | rw     |
| p8aix71base1 | 4089      | None    | rw     |
| p8aix71base2 | 3035      | None    | rw     |
| p8rhel7      | 1334      | None    | rw     |
| p8ubuntu     | 655       | None    | rw     |
| p8viosbase1  | 3913      | None    | rw     |
| p8viosbase2  | 1106      | None    | rw     |

```
$ lssp
Pool Size(mb) Free(mb) Alloc Size(mb) BDs Type
rootvg 540672 407552 512 2 LVPOOL
fbovg 1089024 577024 512 1 LVPOOL
```

```
$ lsvopt
VTD Media Size(mb)
vtopt0 No Media n/a
vtopt1 No Media n/a
vtopt2 No Media n/a
vtopt3 No Media n/a
```

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## OTHER FBO COMMANDS

padmin

- chrep
- chvopt
- loadopt
- lsrep
- lsvopt
- mkrep
- mkvopt
- rmrep
- rmvopt
- unloadopt

lssp

mkvdev

You can then run help <command>

As root

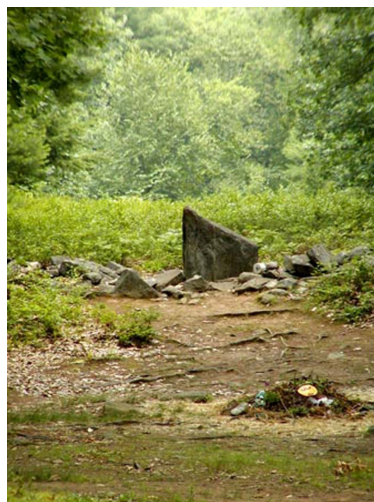
lsvg

mkvg

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## OTHER



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## VIOS ADVISOR

<https://www.ibm.com/developerworks/community/wikis/home/wiki/Power%20Systems/page/VIOS%20Advisor>

Application that collects performance metrics and does a health check  
Productized in VIOS 2.2.2

Current downloadable version is 030813A

Examples follow

- These were run on a production VIO during a regular production day

Duration is between 10 and 60 minutes. Samples collected every 15 seconds

To run for 10 minutes:

```
$ part -i 10
```

Creates a tar file

The report to read is the `vios_advisor_report.xml` report

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## VIOS ADVISOR

```
$ part -i 10
```

part: Reports are successfully generated in `b740vio2_140722_19_46_12.tar`

```
$oem_setup_env
#tar -tvf b740vio2_140722_19_46_12.tar
pwd
/home/padmin/jaqui/b740vio2_140722_19_46_12
ls -l
total 704
-rw-r--r-- 1 root staff 249619 Jul 22 19:56 b740vio2_140722_1946.nmon
drwxr-xr-x 2 padmin staff 4096 Jul 22 19:56 images
-r--r--r-- 1 padmin staff 8122 Jul 22 19:56 popup.js
-r--r--r-- 1 padmin staff 6971 Jul 22 19:56 style.css
-r--r--r-- 1 padmin staff 16869 Jul 22 19:56 vios_advisor.xml
-rw-r--r-- 1 padmin staff 32677 Jul 22 19:56 vios_advisor_report.xml
-r--r--r-- 1 padmin staff 29156 Jul 22 19:56 vios_advisorv2.xml
```

Can also process `nmon` files:

```
$ part -f b750vio1_140721_2359.nmon
```

part: Reports are successfully generated in `b750vio1_140721_2359.tar`

```
tar -tvf b750vio1_140721_2359.tar
-r--r--r-- 10 1 16869 Jul 22 19:48:10 2014 ./b750vio1_140721_2359/vios_advisor.xml
-rw-r--r-- 10 1 36446 Jul 22 19:48:09 2014 ./b750vio1_140721_2359/vios_advisor_report.xml
-r--r--r-- 10 1 29156 Jul 22 19:48:10 2014 ./b750vio1_140721_2359/vios_advisorv2.xml
```

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## SSP LIMITATIONS

<http://www14.software.ibm.com/webapp/set2/sas/f/vios/vios2233.readme.html>

### Limitations for Shared Storage Pool

#### Software Installation

- All VIOS nodes must be at version 2.2.1.3 or later.
- When installing updates for VIOS Update Release 2.2.3.3 participating in a Shared Storage Pool, the Shared Storage Pool Services must be stopped on the node being upgraded.

#### SSP Configuration

| Feature                                        | Min   | Max    |
|------------------------------------------------|-------|--------|
| Number of VIOS Nodes in Cluster                | 1     | 16     |
| Number of Physical Disks in Pool               | 1     | 1024   |
| Number of Virtual Disks (LUs) Mappings in Pool | 1     | 8192   |
| Number of Client LPARs per VIOS node           | 1     | 200    |
| Capacity of Physical Disks in Pool             | 10GB  | 16TB   |
| Storage Capacity of Storage Pool               | 10GB  | 512TB  |
| Capacity of a Virtual Disk (LU) in Pool        | 1GB   | 4TB    |
| Number of Repository Disks                     | 1     | 1      |
| Capacity of Repository Disk                    | 512MB | 1016GB |

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## HMC MAINTENANCE



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## UPGRADING HMC FROM 7.7.7.0 TO 7.7.8

ssh to HMC with 2 sessions

OUR HMC is 7042-cr6 installed at 7.7.7.0 SP2

Upgrading to HMC v7.7.8 MH01388

Step 1 Save upgrade data and then backup to USB stick or remote FTP using GUI

Step 2 check we have plenty of memory

monhmc -r mem -n 0

Mem: 4095732k total, 3978304k used, 117428k free, 311480k buffers

So our server has 4GB memory

monhmc -r disk -n 0

Check if filesystems are full

If they are in use a lot then

chhmcfs -o f -d 0

The above clears out all temp files

monhmc -r disk -n 0

Also lshmcfs shows all filesystems

Check for profile sizing:

<http://www-01.ibm.com/support/docview.wss?uid=nas8N1019821>

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## UPGRADING HMC FROM 7.7.7.0 TO 7.7.8

ssh to HMC with 2 sessions

Since it is an upgrade we need to either use the media or do it via the CLI

On the first of the two ssh sessions: Login and cd /hmcldump

getupgfiles -h ftp.software.ibm.com -u anonymous --passwd ftp -d /software/server/hmc/network/v7780

On second ssh session:

ls -la /hmcldump

You will see files being loaded into the directory

Once everything is downloaded you will no longer see files in this directory

Exit this connection

On the first ssh session

chhmc -c altdiskboot -s enable --mode upgrade

The above tells it to set up to upgrade on boot

hmcshutdown -r -t now

Causes it to do the upgrade and takes about 20 minutes

HMC 778 is now apar MB03715 PTF MH01377

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## UPGRADING HMC FROM 7.7.7.0 TO 7.7.8

Once it is back up we can do the updates:

In the GUI select Updates, Update HMC

Server information is:

ftp.software.ibm.com

anonymous login with your email as password

/software/server/hmc/fixes

Or for service packs

/software/server/hmc/updates

Mandatory fix      apar MB03754      PTF MH01388  
REBOOT HMC

Then do MH01404 is latest update (requires MH01388) using same process as above

After the reboot put in a new USB stick (if that is how backup was done)

Save upgrade data and then backup to USB stick or FTP server using the GUI

**DVD has been disabled at one of the versions so you now need to backup to an FTP server or the 8GB USB stick that you may have purchased with the server.**

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## HMC v8

Required for POWER8

Runs on cr5 or C08 or higher

Will not run on earlier HMCs

Validates entitlement for POWER8

Introduces new Performance and Capacity Monitoring Task

Provides reports on resource utilization

NIST support – updates to JVM

LPM improvements to vSCSI performance

SR-IOV support

Dynamic partition remote restart can be changed when LPAR  
deactivated, not just at creation time

Absolute values for DLPAR

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## UPGRADING TO HMC v8

Check memory and hardware prereqs

i.e.no POWER5, etc

HMC must already be at v7.780 with fixpack MH01402 or HMC v7.7.9 prior to upgrade

PowerVM 2.2.3.0 is required for the new performance metrics

Check prereqs if using redundant HMCs

Process:

Back it up

Get the upgrade files

Reboot to upgrade to v8

Apply first mandatory PTF (can do via GUI)

Reboot

Repeat till you run out of fixes

Backup again after the last reboot

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## USEFUL HMC CLI COMMANDS

|                                  |                                                    |
|----------------------------------|----------------------------------------------------|
| <code>monhmc -r mem -n 0</code>  | shows total, used and free mamory of HMC           |
| <code>monhmc -r disk -n 0</code> | shows filesystems and usage info (same as "df -k") |
| <code>monhmc -r proc -n 0</code> | shows cpu usage of each processor                  |
| <code>monhmc -r swap -n 0</code> | shows paging space usage                           |

|                     |                           |
|---------------------|---------------------------|
| <code>vtmenu</code> | Get a console for an LPAR |
|---------------------|---------------------------|

`getupgfiles -h ftp.software.ibm.com -u anonymous --passwd ftp -d /software/server/hmc/network/v8810`

|                                                            |                                    |
|------------------------------------------------------------|------------------------------------|
| <code>chhmc -c altdiskboot -s enable --mode upgrade</code> | Boot from install image to upgrade |
|------------------------------------------------------------|------------------------------------|

|                                    |            |
|------------------------------------|------------|
| <code>hmcshutdown -r -t now</code> | Reboot now |
|------------------------------------|------------|

|                                |                        |
|--------------------------------|------------------------|
| <code>lshmc -V</code>          | Show HMC version       |
| <code>chhmcfs -o f -d 0</code> | Clear out old logfiles |
| <code>Lshmcfs</code>           | List HMC filesystems   |

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## HMC SCANNER

Latest HMC Scanner is available at <http://tinyurl.com/HMCscanner>

Java program that uses SSH to connect to HMC, FSM or IVM to gather information about the system configuration

I run it on one of the AIX Systems as follows:

- `./hmcScanner.ksh servername hscroot -p password -stats --sanitize`
- Sanitize causes it to produce two spreadsheets – one that has been cleansed of identifying data

Information is organized in tabs in an excel spreadsheet:

- System summary: name, serial number, cores, memory, service processor IP for each server
- LPAR Summary: list of all LPAR by serve with status, environment, version, processor mode
- LPAR CPU: processor configuration of each LPAR
- LPAR MEM: memory configuration of each LPAR
- Physical Slots: list of all slots of each system with LPAR assignment, description, physical location and drc\_index
- Virtual Ethernet: network configuration of each virtual switch and each LPAR
- Virtual SCSI: configuration of all virtual SCSI adapters, both client and server
- VSCSI Map: devices mapped by each VIOS to partitions
- Virtual Fibre: virtual fibre channel configuration of client and server with identification of physical adapter assigned
- **SEA**: SEA configuration and statistics for all VIOS
- SW Cores: LPAR and virtual processor pool configuration matrix to compute the number of software licenses. Simulation of alternative scenarios is possible.
- CPU Pool Usage: monthly average history of CPU usage of each system. Based on last 12 months of IsIparutil data.
- Sys RAM Usage: monthly average history of physical memory assignment to each LPAR. Based on last 12 months of IsIparutil data.
- LPAR CPU Usage: monthly average history of CPU usage of each LPAR. Based on last 12 months of IsIparutil data.
- **CPU Pool Daily Usage**: 1 year of CPU usage of every pool and subpools of each system. Based on daily averages.
- **LPAR Daily Usage**: 1 year of CPU usage of every LPAR of each system. Based on daily averages.
- **CPU Pool Hourly Usage**: 2 months of CPU usage of every pool and subpools of each system. Based on hourly averages.
- **LPAR Hourly Usage**: 2 months of CPU usage of every LPAR of each system. Based on hourly averages.

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## RUNNING HMC SCANNER

I run it from AIX as Windows and Java issues have caused problems

Right now I have HMCScanner11

```
./hmcScanner.ksh hmcname hscroot -p password -stats
```

hmcScanner version 0.11.0

Detecting manager type: HMC

Detecting managed systems: 3 systems present.

Starting managed system configuration collection:

Scanning p720-Server-8202-E4B-SN10934BP: ..... DONE

Scanning p740-Server-8205-E6B-SN10934CP: ..... DONE

Scanning p750-Server-8233-E8B-SN069348P: ..... DONE

Collection successfully finished. Data is in /software/hmcscanner-11/bpichmc/

Performance data collection:

Loading p720-Server-8202-E4B-SN10934BP: . .

Loading p740-Server-8205-E6B-SN10934CP: . .

Loading p750-Server-8233-E8B-SN069348P: . .

..... DONE

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## FIRMWARE MAINTENANCE



## ENTITLEMENT

- Starting with POWER8 IBM will be checking entitlement when applying firmware fixes.
- Entitlement requires an HWMA

POWER8 (and later) servers require machine code  
“update entitlement at activation”

- POWER8 and later servers contain an “update access key” (UAK)

Machine code update entitlement is checked using the UAK at  
each activation / installation

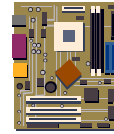
Entitlement check must pass before an update can proceed

- Entitlement is checked based on existing terms and conditions
- Security and safety fixes are exempt from the entitlement check



## MAINTAINING YOUR ENVIRONMENT

- A good fix maintenance strategy is an important part of maintaining and managing your server. Regular maintenance of your server, and application of the latest fixes help to maximize server performance, and may reduce the impact of problems if they arise.
- It is recommended that all servers be kept on a supported release and current with latest available fix packages for HMC and server firmware fixes whenever possible.
- The most important scenario to avoid is remaining on a release so long that all subsequent releases that support a single-step upgrade are withdrawn from marketing. Without a single-step upgrade available, there are no supported ways for you to upgrade your server.



## GENERAL FIRMWARE STRATEGIES

IBM releases new firmware for the following reasons:

The addition of new system function.

To correct or avoid a problem.



There are some natural points at which firmware should be evaluated for potential updates:

- ✓ When a subscription notice advises of a critical or HIPER (highly pervasive) fix, the environment should be reviewed to determine if the fix should be applied.
- ✓ When one of the twice-yearly updates is released.
- ✓ Whenever new hardware is introduced into the environment the firmware pre-reqs and co-reqs should be evaluated.
- ✓ Anytime HMC firmware levels are adjusted.
- ✓ Whenever an outage is scheduled for a system which otherwise has limited opportunity to update or upgrade.
- ✓ When the firmware level your system is on is approaching end-of-service.
- ✓ If other similar hardware systems are being upgraded and firmware consistency can be maximized by a more homogenous firmware level.
- ✓ On a yearly cycle if firmware has not been updated or upgraded within the last year.



## ACCESS TO THE WEB

Have web access in computer room to access the fixes and documentation

Having a landline phone available to use for talking with support etc., it is helpful (what happens if your battery dies?)

Have access to documentation for a server somewhere OTHER than on the server (ESPECIALLY restore procedures!)

- Documentation
- Led codes
- Error Records
- Fixes
- TL



PAGE  
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## REFERENCES



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## USEFUL LINKS

### Charlie Cler Articles

- <http://www.ibmssystemsmag.com/authors/Charlie-Cler/>

### Andrew Goade Articles

- <http://www.ibmssystemsmag.com/authors/Andrew-Goade/>

### Jaqui Lynch Articles

- <http://www.ibmssystemsmag.com/authors/Jaqui-Lynch/>
- <https://enterprisesystemsmedia.com/author/jaqui-lynch>

### Jay Kruemke Twitter – chromeaix

- <https://twitter.com/chromeaix>

### Nigel Griffiths Twitter – mr\_nmon

- [https://twitter.com/mr\\_nmon](https://twitter.com/mr_nmon)

### Gareth Coates Twitter – power\_gaz

- [https://twitter.com/power\\_gaz](https://twitter.com/power_gaz)

### Jaqui's Upcoming Talks and Movies

- Upcoming Talks
  - <http://www.circle4.com/forsyhetalks.html>
- Movie replays
  - <http://www.circle4.com/movies>

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## USEFUL LINKS

### Nigel Griffiths

- AIXpert Blog
  - <https://www.ibm.com/developerworks/mydeveloperworks/blogs/aixpert/?lang=en>
- 10 Golden rules for rPerf Sizing
  - [https://www.ibm.com/developerworks/mydeveloperworks/blogs/aixpert/entry/size\\_with\\_rperf\\_if\\_you\\_must\\_but\\_don\\_t\\_forget\\_the\\_assumptions98?lang=en](https://www.ibm.com/developerworks/mydeveloperworks/blogs/aixpert/entry/size_with_rperf_if_you_must_but_don_t_forget_the_assumptions98?lang=en)
- Youtube channel
  - <http://www.youtube.com/user/nigelargriffiths>

### AIX Wiki

- <https://www.ibm.com/developerworks/wikis/display/WikiPtype/AIX>

### HMC Scanner

- <http://www.ibm.com/developerworks/wikis/display/WikiPtype/HMC+Scanner>

### Workload Estimator

- <http://ibm.com/systems/support/tools/estimator>

### Performance Tools Wiki

- <http://www.ibm.com/developerworks/wikis/display/WikiPtype/Performance+Monitoring+Tools>

### Performance Monitoring

- <https://www.ibm.com/developerworks/wikis/display/WikiPtype/Performance+Monitoring+Documentation>

### Other Performance Tools

- <https://www.ibm.com/developerworks/wikis/display/WikiPtype/Other+Performance+Tools>

Includes new advisors for Java, VIOS, Virtualization

### VIOS Advisor

- <https://www.ibm.com/developerworks/wikis/display/WikiPtype/Other+Performance+Tools#OtherPerformanceTools-VIOSPA>

### Capturing Debug output for padmin

- <http://www-01.ibm.com/support/docview.wss?uid=isg3T1012362>

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## REFERENCES

Gareth Coates – Tricks of the POWER Masters

- [http://public.dhe.ibm.com/systems/power/community/aix/PowerVM\\_webinars/30\\_Tricks\\_of\\_the\\_Power\\_Masters.pdf](http://public.dhe.ibm.com/systems/power/community/aix/PowerVM_webinars/30_Tricks_of_the_Power_Masters.pdf)

Nigel – PowerVM User Group

- <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Power%20Systems/page/PowerVM%20technical%20webinar%20series%20on%20Power%20Systems%20Virtualization%20from%20IBM%20web>

SG24-7940 - PowerVM Virtualization - Introduction and Configuration

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg247940.pdf>

SG24-7590 – PowerVM Virtualization – Managing and Monitoring

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg247590.pdf>

SG24-8080 – Power Systems Performance Guide – Implementing and Optimizing

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg248080.pdf>

SG24-8079 – Power 7 and 7+ Optimization and Tuning Guide

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg248079.pdf>

Redbook Tip on Maximizing the Value of P7 and P7+ through Tuning and Optimization

- <http://www.redbooks.ibm.com/technotes/tips0956.pdf>

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## VIOS SPECIFIC REFERENCES

SDD and SDDPCM Specific procedures for VIOS

- <http://www-01.ibm.com/support/docview.wss?uid=ssg1S7002686&aid=1>

VOS 2.2.3.3 README

- <http://www14.software.ibm.com/webapp/set2/sas/f/vios/vios2233.readme.html>

SG24-7940 - PowerVM Virtualization - Introduction and Configuration

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg247940.pdf>

SG24-7590 – PowerVM Virtualization – Managing and Monitoring

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg247590.pdf>

SG24-8080 – Power Systems Performance Guide – Implementing and Optimizing

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg248080.pdf>

SG24-8079 – Power 7 and 7+ Optimization and Tuning Guide

- <http://www.redbooks.ibm.com/redbooks/pdfs/sg248079.pdf>

Redbook Tip on Maximizing the Value of P7 and P7+ through Tuning and Optimization

- <http://www.redbooks.ibm.com/technotes/tips0956.pdf>

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## THANK YOU FOR YOUR TIME

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If you have questions please email me at:

[lynchi@forsythe.com](mailto:lynchi@forsythe.com)

Also check out:

<http://www.circle4.com/forsythetalks.html>

<http://www.circle4.com/movies/>

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## VIOS ADVISOR OUTPUT

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## VIOS ADVISOR

The ratings and recommendations in the table below were chosen with the following information:

Hostname : vio1. .com

PartitionID: 2

Monitoring Start Time : 03/09 11:45:19

Monitoring Stop Time : 03/09 13:45:19 Duration : 120 min

IBM Systems Workload Estimator link: <http://ibm.com/systems/support/tools/estimator> (VIOS Sizings)

| SYSTEM - CONFIGURATION          |                     |
|---------------------------------|---------------------|
| Name                            | Value               |
| Processor Family                | POWER6              |
| Server Model                    | IBM,9117-MMA        |
| Server Frequency                | 4.208 GHz           |
| Server - Online CPUs            | 10 cores            |
| Server - Maximum Supported CPUs | 16 cores            |
| VIOS Level                      | 2.2.0.13-FP24 SP-03 |
| VIOS Advisor Release            | 121211B             |

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## VIOS ADVISOR

| VIOS - CPU |                          |                                                      |                   |                |               |                               |                                 |
|------------|--------------------------|------------------------------------------------------|-------------------|----------------|---------------|-------------------------------|---------------------------------|
|            | Name                     | Measured Value                                       | Recommended Value | First Observed | Last Observed | Risk<br>1=lowest<br>5=highest | Impact<br>1=lowest<br>5=highest |
| ✓          | CPU Capacity             | 1.0 ent                                              | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| 🔒          | CPU Consumption          | avg:5.4%<br>(cores:0.1)<br>high:40.2%<br>(cores:0.5) | -                 | -              | -             | n/a                           | n/a                             |
| 🔒          | Processing Mode          | Shared CPU,<br>(UnCapped)                            | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| ✓          | Variable Capacity Weight | 200                                                  | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| ✓          | Virtual Processors       | 2 vCPUs                                              | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| ✓          | SMT Mode                 | SMT2                                                 | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |

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## VIOS ADVISOR

| SYSTEM - SHARED PROCESSING POOL |                                 |                                           |                   |                |               |                               |                                 |
|---------------------------------|---------------------------------|-------------------------------------------|-------------------|----------------|---------------|-------------------------------|---------------------------------|
|                                 | Name                            | Measured Value                            | Recommended Value | First Observed | Last Observed | Risk<br>1=lowest<br>5=highest | Impact<br>1=lowest<br>5=highest |
| ✓                               | Shared Pool Monitoring          | enabled                                   | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| 🔒                               | Shared Processing Pool Capacity | 10.0 ent.                                 | -                 | 03/09 11:45:19 | -             | n/a                           | n/a                             |
| ✓                               | Free CPU Capacity               | avg_free:9.4 ent.<br>lowest_free:7.7 ent. | -                 | -              | -             | n/a                           | n/a                             |

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## VIOS ADVISOR

| VIOS - I/O ACTIVITY    |                                                                                                             |
|------------------------|-------------------------------------------------------------------------------------------------------------|
| Name                   | Value                                                                                                       |
| 🔒 Disk I/O Activity    | avg: 229 iops @ 32KB peak: 1916 iops @ 137KB                                                                |
| 🔒 Network I/O Activity | [ avgSend: 0 iops 0.0MBps , avgRcv: 0 iops 0.0MBps ] [ peakSend: 0 iops 0.0MBps , peakRcv: 0 iops 0.0MBps ] |

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## VIOS ADVISOR

| VIOS - DISK ADAPTERS                                                              |                        |                     |                   |                |                |                               |                                 |
|-----------------------------------------------------------------------------------|------------------------|---------------------|-------------------|----------------|----------------|-------------------------------|---------------------------------|
|                                                                                   | Name                   | Measured Value      | Recommended Value | First Observed | Last Observed  | Risk<br>1=lowest<br>5=highest | Impact<br>1=lowest<br>5=highest |
|  | FC Adapter Count       | 3                   | -                 | 03/09 11:45:19 | -              | n/a                           | n/a                             |
|  | FC Avg IOps            | avg: 77 iops @ 32KB | -                 | 03/09 11:45:19 | 03/09 13:45:19 | n/a                           | n/a                             |
|  | FC Adapter Utilization | optimal             | -                 | -              | -              | n/a                           | n/a                             |
|  | FC Port Speeds         | running at speed    | -                 | -              | -              | n/a                           | n/a                             |

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## VIOS ADVISOR

| VIOS - DISK DRIVES                                                                  |                           |                                                   |                   |                |                |                               |                                 |
|-------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------|-------------------|----------------|----------------|-------------------------------|---------------------------------|
|                                                                                     | Name                      | Measured Value                                    | Recommended Value | First Observed | Last Observed  | Risk<br>1=lowest<br>5=highest | Impact<br>1=lowest<br>5=highest |
|  | Physical Drive Count      | 93                                                | -                 | 03/09 11:45:19 | -              | n/a                           | n/a                             |
|  | I/Os Blocked              | optimal                                           | -                 | -              | -              | n/a                           | n/a                             |
|  | Long I/O Latency (hdisk3) | avg:9.7ms (9.7 + 0.0)<br>high:11.5ms (11.5 + 0.0) | Range: 8-12ms     | 03/09 12:35:58 | 03/09 13:44:02 | n/a                           | n/a                             |

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## VIOS ADVISOR

| VIOS - MEMORY                                                                     |                   |                  |                   |                |                |                               |                                 |
|-----------------------------------------------------------------------------------|-------------------|------------------|-------------------|----------------|----------------|-------------------------------|---------------------------------|
|                                                                                   | Name              | Measured Value   | Recommended Value | First Observed | Last Observed  | Risk<br>1=lowest<br>5=highest | Impact<br>1=lowest<br>5=highest |
|  | Real Memory       | 4.000 GB         | 7.000 GB          | 03/09 11:45:19 | -              | 1                             | 2                               |
|  | Available Memory  | 0.346 GB         | 1.5 GB Avail.     | 03/09 11:45:39 | 03/09 13:45:05 | n/a                           | n/a                             |
|  | Paging Rate       | 0.2 MB/s pg rate | -                 | -              | -              | n/a                           | n/a                             |
|  | Paging Space Size | 8.000 GB         | -                 | 03/09 11:45:19 | -              | n/a                           | n/a                             |
|  | Free Paging Space | 7.923 GB free    | -                 | -              | -              | n/a                           | n/a                             |
|  | Pinned Memory     | 1.262 GB pinned  | -                 | -              | -              | n/a                           | n/a                             |

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## USEFUL COMMANDS

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## USEFUL COMMANDS

### Command History

```
$ fc -l
725 lsrep
726 backupios -file /usr/local/backups/b750viobkp
727 exit
728 lsmapi -vadapter vhost0
729 fc -l
```

### Global command log

```
$ lsgcl | grep "Aug 9 2013"
Aug 9 2013, 08:25:35 root ioslevel
Aug 9 2013, 08:59:22 padmin license
Aug 9 2013, 09:00:29 padmin lsmapi -vadapter vhost0
Aug 9 2013, 09:01:29 padmin lsgcl
```

### Redirecting output when running as padmin

```
lsmapi -all -npiv | tee npivdata.txt
```

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## USEFUL COMMANDS

### ***vSCSI Commands***

```
mkvdev -vdev hdisk2 -vadapter vhost0
mkvdev -fbo -vadapter vhost0
```

### ***NPIV***

#### Setup NPIV mappings

```
vfcmap -vadapter vfchost0 -fcf fcs0
lsmapi -npiv -all
lsmapi -vadapter vfchost0 -npiv
lsdev -virtual
lsnports
lsdev -slots
lscfg -vpl vfchost0
```

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**USEFUL COMMANDS****\$ lsdev -virtual**

| name         | status    | description                                    |
|--------------|-----------|------------------------------------------------|
| ent5         | Available | Virtual I/O Ethernet Adapter (I-lan)           |
| ent6         | Available | Virtual I/O Ethernet Adapter (I-lan)           |
| ent7         | Available | Virtual I/O Ethernet Adapter (I-lan)           |
| vasi0        | Available | Virtual Asynchronous Services Interface (VASI) |
| vbsd0        | Available | Virtual Block Storage Device (VBSD)            |
| vfchost0     | Available | Virtual FC Server Adapter                      |
| vfchost1     | Available | Virtual FC Server Adapter                      |
| vhost0       | Available | Virtual SCSI Server Adapter                    |
| vhost1       | Available | Virtual SCSI Server Adapter                    |
| vsa0         | Available | LPAR Virtual Serial Adapter                    |
| b740ios1_rv1 | Available | Virtual Target Device - Logical Volume         |
| b740l1_rv1   | Available | Virtual Target Device - Logical Volume         |
| vtopt0       | Available | Virtual Target Device - File-backed Optical    |
| vtopt1       | Available | Virtual Target Device - File-backed Optical    |
| vtscsi0      | Available | Virtual Target Device - Disk                   |
| vtscsi1      | Available | Virtual Target Device - Disk                   |
| vtscsi2      | Available | Virtual Target Device - Disk                   |
| vtscsi3      | Available | Virtual Target Device - Disk                   |
| ent8         | Available | Shared Ethernet Adapter                        |

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**USEFUL COMMANDS****\$ lsmap -vadapter vhost0**

| SVSA           | Physloc                  | Client Partition ID |
|----------------|--------------------------|---------------------|
| vhost0         | U8205.E6B.10934CP-V1-C21 | 0x00000003          |
| <br>           |                          |                     |
| VTD            | b740l1_rv1               |                     |
| Status         | Available                |                     |
| LUN            | 0x8300000000000000       |                     |
| Backing device | lv_b740l1                |                     |
| Physloc        |                          |                     |
| Mirrored       | N/A                      |                     |
| <br>           |                          |                     |
| VTD            | vtopt0                   |                     |
| Status         | Available                |                     |
| LUN            | 0x8200000000000000       |                     |
| Backing device |                          |                     |
| Physloc        |                          |                     |
| Mirrored       | N/A                      |                     |
| <br>           |                          |                     |
| VTD            | vtopt1                   |                     |
| Status         | Available                |                     |
| LUN            | 0x8100000000000000       |                     |
| Backing device |                          |                     |
| Physloc        |                          |                     |
| Mirrored       | N/A                      |                     |

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**USEFUL COMMANDS****\$ lsmmap -vadapter vfchost0 -npiv**

| Name     | Physloc                  | ClntID | ClntName | ClntOS |
|----------|--------------------------|--------|----------|--------|
| vfchost0 | U8205.E6B.10934CP-V1-C31 | 3      |          |        |

Status:NOT\_LOGGED\_IN

FC name:fcs0 FC loc code:U78AA.001.WZSG8PD-P1-C5-T1

Ports logged in:0

Flags:4&lt;NOT\_LOGGED&gt;

VFC client name: VFC client DRC:

**\$ lsmmap -vadapter vfchost4 -npiv**

| Name     | Physloc                  | ClntID | ClntName | ClntOS |
|----------|--------------------------|--------|----------|--------|
| vfchost4 | U8205.E6B.10934CP-V1-C36 | 8      | b740nl1  | AIX    |

Status:LOGGED\_IN

FC name:fcs0 FC loc code:U78AA.001.WZSG8PD-P1-C5-T1

Ports logged in:3

Flags:a&lt;LOGGED\_IN,STRIP\_MERGE&gt;

VFC client name:fcs0 VFC client DRC:U8205.E6B.10934CP-V8-C36

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**USEFUL COMMANDS****\$ lsports**

| name | physloc                    | fabric | tports | aports | swwpns | awwpns |
|------|----------------------------|--------|--------|--------|--------|--------|
| fcs0 | U78AA.001.WZSG8PD-P1-C5-T1 | 1      | 64     | 63     | 2048   | 2041   |

**\$ lsdev -slots**

| # Slot                      | Description      | Device(s)  |
|-----------------------------|------------------|------------|
| HEA 1                       | Logical I/O Slot | lhea0 ent0 |
| U8205.E6B.10934CP-V1-C0     | Virtual I/O Slot | vsa0       |
| U8205.E6B.10934CP-V1-C11    | Virtual I/O Slot | ent5       |
| U8205.E6B.10934CP-V1-C12    | Virtual I/O Slot | ent6       |
| U8205.E6B.10934CP-V1-C13    | Virtual I/O Slot | ent7       |
| U8205.E6B.10934CP-V1-C21    | Virtual I/O Slot | vhost0     |
| U8205.E6B.10934CP-V1-C22    | Virtual I/O Slot | vhost1     |
| U8205.E6B.10934CP-V1-C23    | Virtual I/O Slot | vhost2     |
| U8205.E6B.10934CP-V1-C31    | Virtual I/O Slot | vfchost0   |
| U8205.E6B.10934CP-V1-C32    | Virtual I/O Slot | vfchost1   |
| U8205.E6B.10934CP-V1-C33    | Virtual I/O Slot | vfchost2   |
| U8205.E6B.10934CP-V1-C32769 | Virtual I/O Slot | vasi0      |
| U8205.E6B.10934CP-V1-C32773 | Virtual I/O Slot | vasi1      |
| U8205.E6B.10934CP-V1-C32774 | Virtual I/O Slot | vasi2      |
| U8205.E6B.10934CP-V1-C32775 | Virtual I/O Slot | vasi3      |
| U8205.E6B.10934CP-V1-C32776 | Virtual I/O Slot | vasi4      |

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## USEFUL HMC COMMANDS

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## USEFUL HMC COMMANDS

```
hscroot@bpichmc:~>lshmc -b
"bios=D6E149AUS-1.09
"
```

```
hscroot@bpichmc:~>lshmc -r
ssh=enable,sshprotocol=,remotewebui=enable,xntp=disable,xntpserver=127.127.1.0,syslogserver=,syslog
tcpserver=,syslogtlserver=,altdiskboot=disable,ldap=disable,kerberos=disable,kerberos_default_realm=k
erberos_realm_kdc=,kerberos_clockskew=,kerberos_ticket_lifetime=,kpasswd_admin=,trace=,kerberos_k
eyfile_present=,kerberos_allow_weak_crypto=,legacyhmccomm=disable,security=legacy,sol=disabled
```

```
hscroot@bpichmc:~>lshmc -e
emch=disabled,callhome=enabled,registered_hmcs=
```

### On HMC check LMB sizes

```
hscroot@bpichmc:~>lshwres -r mem -m p740-Server-8205-E6B-SN10934CP --level sys -F
mem_region_size
256
```

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## USEFUL HMC COMMANDS – HMC UPDATES

ssh to HMC as hscroot or your userid

Use with great care

saveupgdata -r disk

getupgfiles -h public.dhe.ibm.com -u anonymous --passwd anonymous -d  
/software/server/hmc/network/v8810

ls -la /hmcDump

chhmc -c altdiskboot -s enable -mode upgrade

tail -f /tmp/HmcInstall.log during upgrade

Directories on FTP Server (ftp.software.ibm.com)

Upgrades: /software/server/hmc/network/v8810

Fixes: /software/server/hmc/fixes

Service Packs: /software/server/hmc/updates

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## USEFUL HMC COMMANDS

ssh to HMC as hscroot or your userid

Useful Commands:

lshmc

vtmenu - way better than ascii console

lshwres

monhmc -r mem -n 0 how much memory do I have?

monhmc -r proc -n 0 CPU usage

monhmc -r swap -n 0 Page space

monhmc -r disk -n 0 What is my disk utilization?

chhmcfs -r disk -n 0 Clear out all temp files

lshmcfs

hmcshutdown -r -t now Reboot HMC

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## USEFUL HMC COMMANDS – 7042-CR6

**hscroot@bpichmc:~>monhmc -r mem -n 0**

Mem: 4043216k total, 3885308k used, 157908k free, 484132k buffers (has 4GB)

**hscroot@bpichmc:~>monhmc -r proc -n 0**

Cpu0 : 0.0%us, 0.7%sy, 0.0%ni, 98.3%id, 1.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu1 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu2 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu3 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st

**hscroot@bpichmc:~>monhmc -r swap -n 0**

Swap: 2040244k total, 137456k used, 1902788k free, 1036824k cached

**hscroot@bpichmc:~>monhmc -r disk -n 0**

| Filesystem                     | 1K-blocks | Used    | Available | Use% | Mounted on   |
|--------------------------------|-----------|---------|-----------|------|--------------|
| /dev/sda2                      | 16121184  | 7100064 | 8202208   | 47%  | /            |
| /dev/sda3                      | 6040320   | 297672  | 5435808   | 6%   | /var         |
| /dev/mapper/HMCDDataVG-HomeLV  | 10321208  | 245052  | 9551868   | 3%   | /home        |
| /dev/mapper/HMCDDataVG-LogLV   | 8256952   | 1292372 | 6545152   | 17%  | /var/hsc/log |
| /dev/mapper/HMCDDataVG-DumpLV  | 123854820 | 319672  | 117243692 | 1%   | /dump        |
| /dev/mapper/HMCDDataVG-ExtraLV | 20642428  | 198692  | 19395160  | 2%   | /extra       |
| /dev/mapper/HMCDDataVG-DataLV  | 227067260 | 455376  | 215077548 | 1%   | /data        |

**hscroot@bpichmc:~>lshmcfs**

filesystem=/var,filesystem\_size=8063,filesystem\_avail=6390,temp\_files\_start\_time=07/14/2014 13:11:00,temp\_files\_size=783  
 filesystem=/dump,filesystem\_size=120951,filesystem\_avail=114495,temp\_files\_start\_time=07/14/2014 21:09:00,temp\_files\_size=0  
 filesystem=/extra,filesystem\_size=20158,filesystem\_avail=18940,temp\_files\_start\_time=none,temp\_files\_size=0  
 filesystem=/,filesystem\_size=15743,filesystem\_avail=8009,temp\_files\_start\_time=07/22/2014 23:18:00,temp\_files\_size=0

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## USEFUL HMC COMMANDS – 7042-CR7

**hscroot@bpic8hmc:~>monhmc -r mem -n 0**

Mem: 41263576k total, 3608896k used, 37654680k free, 551600k buffers  
 Either it has 41GB memory or there is a bug @

**hscroot@bpic8hmc:~>monhmc -r proc -n 0**

Cpu0 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu1 : 0.0%us, 0.3%sy, 0.0%ni, 99.7%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu2 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu3 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu4 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
 Cpu5 : 0.0%us, 0.0%sy, 0.0%ni, 100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st

**hscroot@bpic8hmc:~>monhmc -r swap -n 0**

Swap: 2040244k total, 0k used, 2040244k free, 934024k cached

**hscroot@bpic8hmc:~>monhmc -r disk -n 0**

| Filesystem                     | 1K-blocks | Used    | Available | Use% | Mounted on   |
|--------------------------------|-----------|---------|-----------|------|--------------|
| /dev/sda2                      | 16121184  | 6715032 | 8587240   | 44%  | /            |
| /dev/sda3                      | 6040320   | 270112  | 5463368   | 5%   | /var         |
| /dev/mapper/HMCDDataVG-HomeLV  | 10321208  | 244856  | 9552064   | 3%   | /home        |
| /dev/mapper/HMCDDataVG-LogLV   | 8256952   | 479796  | 7357728   | 7%   | /var/hsc/log |
| /dev/mapper/HMCDDataVG-DumpLV  | 61927420  | 187024  | 58594668  | 1%   | /dump        |
| /dev/mapper/HMCDDataVG-ExtraLV | 20642428  | 198692  | 19395160  | 2%   | /extra       |
| /dev/mapper/HMCDDataVG-DataLV  | 144497320 | 195428  | 136961860 | 1%   | /data        |

**hscroot@bpic8hmc:~>lshmcfs**

filesystem=/var,filesystem\_size=8063,filesystem\_avail=7185,temp\_files\_start\_time=07/14/2014 16:33:00,temp\_files\_size=318  
 filesystem=/dump,filesystem\_size=60475,filesystem\_avail=57221,temp\_files\_start\_time=07/14/2014 20:15:00,temp\_files\_size=0  
 filesystem=/extra,filesystem\_size=20158,filesystem\_avail=18940,temp\_files\_start\_time=none,temp\_files\_size=0  
 filesystem=/,filesystem\_size=15743,filesystem\_avail=8385,temp\_files\_start\_time=07/22/2014 22:43:00,temp\_files\_size=0

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## USEFUL HMC COMMANDS

```

lshmc
-V - Displays HMC version information.
-v - Displays HMC VPD information.
-r - Displays HMC remote access settings.
-n - Displays HMC network settings.
-b - Displays the BIOS level of the HMC.
-l - Displays the current locale for the HMC.
-L - Displays all supported locales for the HMC.
-h - Displays HMC hardware information.
-i - Displays HMC Integrated Management Module (IMM)
 settings.
-e - Displays HMC settings for Events Manager for Call
 Home.
-F [<attribute names>] - delimiter-separated list of the names of the
 attributes to be listed for the specified HMC
 setting. If no attribute names are specified,
 then all attributes will be listed.
--header - prints a header of attribute names when -F is
 also specified
--help - prints this help

```

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## USEFUL HMC COMMANDS

ssh to HMC as hscroot or your userid

```

hscroot@bpichmc:~>lshmc -V
"version= Version: 8
Release: 8.1.0
Service Pack: 0
HMC Build level 20140602.3
MH01421: Required fix for HMC V8R8.1.0 (06-03-2014)
MH01436: Fix for OpenSSL.GnuTLS (06-11-2014)
MH01441: Fix for HMC V8R8.1.0 (06-23-2014)
","base_version=V8R8.1.0
"

```

```

hscroot@bpichmc:~>lshmc -v
"vpd=*FC ???????
*VC 20.0
*N2 Wed Jul 23 04:45:57 UTC 2014
*FC ???????
*DS Hardware Management Console
*TM 7042-CR6
*SE 102EEEC
*MN IBM
*PN 0B20PT
*SZ 4140253184
*OS Embedded Operating Systems
*NA 10.250.134.20
*FC ???????
*DS Platform Firmware
*RM V8R8.1.0.0
"

```

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