More Tricks of the Power Masters

Starting at 10:00 am UK time

Gareth Coates

Smart Meeting → Put questions into the Chat box
or AT&T Toll Free phone for better audio
- 0800-368-0638 = UK Toll Free
- 0203-059-6451 = UK but you pay for the call
- Then 6403785# Participant Code
- Other countries see chat box for the website
- Please Mute with ∗6

AIX Linux i for Business

Previous Sessions:
POWER8 from hands-on
Power up your Linux
PowerVC
PowerVP
SSP4
Best Practices
Tricks of Power Masters
IBMi and External Storage
Monitoring with ITM
Whole Machine Monitoring
Electric Server Agent
RDX Removable disks
And more…..

Future Sessions →

- 16th July - PowerKVM Deep Dive
- Suggestions Welcome

Gareth Coates @power_gaz   Nigel Griffiths @mr_nmon
Jyoti Dodhia @JyotiDodhia   Mandie Quartly @mandieq

Website: http://tinyurl.com/PowerSystemsTechnicalWebinars
Youtube Channel: http://tinyurl.com/IBMPowerVUGYoutubeChannel

Speaker Name   **Gareth Coates**

Job Role   **Power - Advanced Technology Support**

Company   **IBM UK Limited**

Tricks of the Power Masters

(updated 10th June 2014)

9.0

Session objectives

- Lots of tips and tricks.
  – Hopefuly useful

- Hardware
- Firmware
- HMC
- VIOS
- AIX

DISCLAIMER

Neither I nor IBM can take any responsibility for any work you carry out without our direct involvement!

- One liners
- Concepts
- Other pointers which may need more research
  – eg: Redbooks

Credits

- The tips here came from many sources
- Personal experience
- Other people, including

  - Nigel Griffiths
    - Power ATS Europe
  - Pat O'Rourke
    - Briefing Center (sic), Austin,TX
  - Jay Kruemcke
    - Mr AIX, Austin,TX
  - Chris Gibson
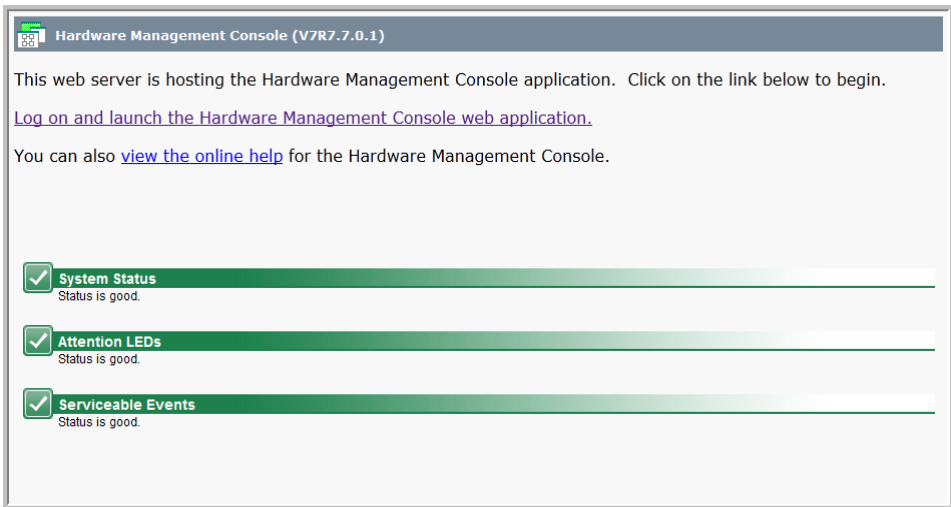   - Australian AIX guru

  - And many others – too many to mention

Some pretty big ones

- You really should use these
  - Or at least consider them very seriously

<div align="center">

NIM
PowerVP
PowerVC
DPO
LPM
SSP

</div>

HMC

Hardware Management Console (V7R7.0.1)

This web server is hosting the Hardware Management Console application. Click on the link below to begin.

Log on and launch the Hardware Management Console web application.

You can also view the online help for the Hardware Management Console.

System Status
Status is good.

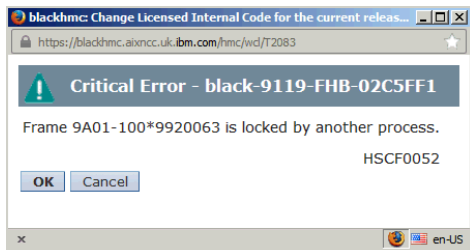Attention LEDs
Status is good.

Serviceable Events
Status is good.

Refresh O/S level information on the HMC

- Force a refresh of the operating system level information on the HMC once AIX is upgraded on the partitions

- `lssyscfg -r lpar -m <managed system>  --osrefresh`

- When listing partitions, specify this option to refresh the current operating system version information for the partitions first.

- If a partition does not have an active RMC connection to the management console, Unknown will be displayed for that partition's operating system version information.

- Specifying this option may cause this command to take a long time to complete if many partitions are being listed or there are network issues.

Frame is locked

- Trying to do a firmware update on a 9119-FHB gave this:

blackhmc: Change Licensed Internal Code for the current releas...
https://blackhmc.aixncc.uk.ibm.com/hmc/wcl/T2083

⚠ **Critical Error - black-9119-FHB-02C5FF1**

Frame 9A01-100*9920063 is locked by another process.

HSCF0052

OK   Cancel

- If, and only if you are sure ….

- see which hmc has the lock
- `lslock -e <frame_name>`

- to clear it :
- `rmlock -e <frame_name>`
- should then be OK

Clive Benjamin

Principal Engineer

IBM UK Limited

- Question:
- Why did this happen?

- Answer:
- An attempted upgrade had failed part way through

HMC Upgrades

- Download code from FixCentral, burn some media etc etc

- OR

- Download Network install images from
  - http://www14.software.ibm.com/webapp/set2/sas/f/netinstall/home.html

File name	Description	Destination path	Size (bytes)	Checksum
bzImage	Kernel image	/var/tftp/hmc	2730176	02364
initrd.gz	Ram Disk file system	/var/tftp/hmc	34185788	06816
disk1.img	Base Image	/home/hmc	817065984	55470
disk2.img	Base HMC Image	/home/hmc	1456427008	33312
disk3.img	Information Center Image	/home/hmc	873922560	45622
hmcnetworkfiles.sum	hmcnetworkfiles.sum	/home/hmc	78 bytes	n/a

HMC upgrades over the network

- Why bother?

- Network upgrades take far less time than using media
  - Assuming a half decent LAN eg: Gbit

- You do not need to be in the computer room

HMC upgrades over the network

- Always read the instructions, but here is an overview:

- On the HMC, save upgrade:
  - **saveupgdata -r disk**

- Copy the files over to the bootable disk partition on the HMC.
  - **getupgfiles –h <hostname> -u <userid> -d <directory>**

- After the files are copied over, run the following command:
  chhmc -c altdiskboot -s enable --mode upgrade

- Reboot the HMC
  - **hmcshutdown -r -t now**

VIOS

HMC one liner to run a command on every VIOS

Brian Smith
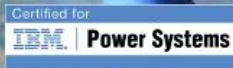

```
for sys in `lssyscfg -r sys -F name`; do for vio in
`lssyscfg -r lpar -m $sys -F name,lpar_env | grep
vioserver | cut -f 1 -d, | sort`; do echo $vio;
viosvrcmd -m $sys -p $vio -c errlog; done; done
```

https://www.ibm.com/developerworks/community/blogs/brian/entry/hmc_one_liner_to_run_a_command_on_every_vio_server?lang=en

viosbr

- A useful command to backup VIOS configuration

- Recommended for inclusion
  - by Daniel.Loftus@mckesson.co.uk

- Performs the operations for backing up the virtual and logical configuration, listing the configuration, and restoring the configuration of the Virtual I/O Server.

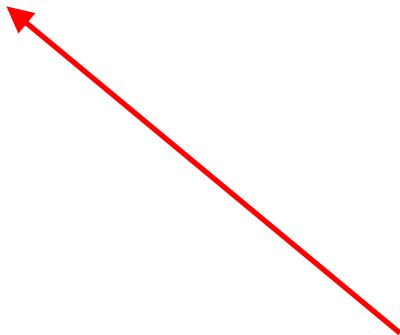- The viosbr command can be run only by the padmin user.

viosbr -backup -file viosbr.out

```
$ viosbr -backup -file viosbr.out
Backup of this node (purplevio1.aixncc.uk.ibm.com) successful



$ viosbr -view  -file viosbr.out.tar.gz
```

viosbr -view -file viosbr.out.tar.gz

```
Controllers:
============
Name            Phys Loc
----            --------
iscsi0
sissas0         U5802.001.00H1960-P1-C1-T1
sissas1         U5802.001.00H1960-P1-C4-T1
pager0          U9117.MMB.100525P-V3-C32769-L0-L0
vasi0           U9117.MMB.100525P-V3-C32769
vbsd0           U9117.MMB.100525P-V3-C32769-L0
sata0           U5802.001.00H1960-P1-C1-T1
sata1           U5802.001.00H1960-P1-C4-T1
lhea0
lhea1           U78C0.001.DBJ0440-P2
fcs0            U5802.001.00H1960-P1-C10-T1
fcs1            U5802.001.00H1960-P1-C10-T2
sfwcomm0        U5802.001.00H1960-P1-C10-T1-W0-L0
sfwcomm1        U5802.001.00H1960-P1-C10-T2-W0-L0
sfwcomm2        SAS
sfwcomm3        SAS
fscsi0          U5802.001.00H1960-P1-C10-T1
ent0            U78C0.001.DBJ0440-P2-C8-T2
fscsi1          U5802.001.00H1960-P1-C10-T2
ent1            U9117.MMB.100525P-V3-C44-T1
ent2            U9117.MMB.100525P-V3-C45-T1
sas0            U5802.001.00H1960-P1-C1-T1
sas1            U5802.001.00H1960-P1-C4-T1
sfw0
fcnet0          U5802.001.00H1960-P1-C10-T1
fcnet1          U5802.001.00H1960-P1-C10-T2
```

viosbr -view   -file viosbr.out.tar.gz

```
Physical Volumes:
=================
Name            Phys Loc
----            --------
hdisk20         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L2000000000000
hdisk21         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L3000000000000
hdisk22         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L4000000000000
hdisk23         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L5000000000000
hdisk24         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L6000000000000
hdisk0          U5802.001.00H1960-P3-D1
hdisk1          U5802.001.00H1960-P3-D2
hdisk2          U5802.001.00H1960-P3-D3
hdisk3          U5802.001.00H1960-P3-D4
hdisk4          U5802.001.00H1960-P3-D5
hdisk5          U5802.001.00H1960-P3-D6
hdisk6          U5802.001.00H1960-P3-D7
hdisk7          U5802.001.00H1960-P3-D8
hdisk8          U5802.001.00H1960-P3-D9
hdisk9          U5802.001.00H1960-P3-D10
hdisk10         U5802.001.00H1960-P3-D11
hdisk11         U5802.001.00H1960-P3-D12
hdisk12         U5802.001.00H1960-P3-D13
hdisk13         U5802.001.00H1960-P3-D14
hdisk14         U5802.001.00H1960-P3-D15
hdisk15         U5802.001.00H1960-P3-D16
hdisk16         U5802.001.00H1960-P3-D17
hdisk17         U5802.001.00H1960-P3-D18
hdisk18         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L0
hdisk19         U5802.001.00H1960-P1-C10-T1-W500507680210AC8C-L1000000000000

Optical Devices:
================
Name            Phys Loc
----            --------

Tape Devices:
=============
Name            Phys Loc
----            --------
```

viosbr -view -file viosbr.out.tar.gz

```
Ethernet Interfaces:
====================
Name
----
en0
en1
en2
en3

Storage Pools:
==============
SP Name                    PV Name
-------                    -------
rootvg                     hdisk0
                           hdisk1

clientsvg                  hdisk2
                           hdisk3
                           hdisk4
                           hdisk5
                           hdisk6
                           hdisk7
                           hdisk8
                           hdisk9
                           hdisk10
                           hdisk11
                           hdisk12
                           hdisk13
                           hdisk14
                           hdisk15
                           hdisk16
                           hdisk17
```

viosbr -view   -file viosbr.out.tar.gz

```
Optical Repository:
===================
Name                      Parent SP
----                      ---------
VMLibrary                 clientsvg

Shared Ethernet Adapters:
=========================
Name            Physical Adapter   Default Adapter    Virtual Adapters
----            ---------------    --------------     ---------------
ent3            ent0               ent1               ent1
```

viosbr -view -file viosbr.out.tar.gz

```
Virtual Server Adapters:
========================
SVSA            Phys Loc                 VTD
----            --------                 ---
vhost13         U9117.MMB.100525P-V3-C24 purple14_1.vtd

vhost14         U9117.MMB.100525P-V3-C25
vhost15         U9117.MMB.100525P-V3-C26
vhost16         U9117.MMB.100525P-V3-C32 vtscsi7
                                         vtopt1

vhost0          U9117.MMB.100525P-V3-C11 vtscsi1
                                         vtscsi0
                                         vtscsi8
                                         vtopt3
                                         vtscsi4

vhost1          U9117.MMB.100525P-V3-C12
vhost2          U9117.MMB.100525P-V3-C13 purple3_1.vtd

vhost3          U9117.MMB.100525P-V3-C14 vtopt0
                                         vtscsi10
                                         vtscsi9
                                         purple4_1.vtd

vhost4          U9117.MMB.100525P-V3-C15 purple5_1.vtd

vhost5          U9117.MMB.100525P-V3-C16 purple6_1.vtd

vhost6          U9117.MMB.100525P-V3-C17 vtopt2
                                         purple7_1.vtd

vhost7          U9117.MMB.100525P-V3-C18 vtopt4
                                         vtscsi6
                                         vtscsi5

vhost8          U9117.MMB.100525P-V3-C19
vhost9          U9117.MMB.100525P-V3-C20 vtopt6
                                         vtscsi11

vhost10         U9117.MMB.100525P-V3-C21 vtscsi12

vhost11         U9117.MMB.100525P-V3-C22
vhost12         U9117.MMB.100525P-V3-C23
```

viosbr -view -file viosbr.out.tar.gz

```
RSCT:
=====
ct_node_id
-----------
9df352ea78a5d4e9

Cluster:
========
Cluster          State
-------          -----

Virtual Log Repositories:
=========================
Virtual Log Repository   State
----------------------   -----

vlogrepo0        AVAILABLE
$
```

Which VIOS provides your vSCSI

- Run this as root in a client LPAR

```
# print "cvai" | kdb | grep vscsi | grep -v read
vscsi0     0x000007 0x0000000000 0x0 plum-vio1->vhost0
vscsi1     0x000007 0x0000000000 0x0 plum-vio1->vhost1
#
```

- shows the VIOS and vhost for a client vscsi adapter.

Be VERY careful with kdb

Hardware

list all the WWPN on a system

- `lshwres -r io --rsubtype slotchildren -m Server-9117-MMB-SN101509A -F phys_loc,description,mac_address,wwpn,microcode_version |grep Fibre`

-
```
U78C0.001.DBJJ568-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b7cbf0,null
U78C0.001.DBJJ568-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b7cbf1,null
U78C0.001.DBJJ568-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9c6aa32,null
U78C0.001.DBJJ568-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9c6aa33,null
U78C0.001.DBJJ568-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65cc3,null
U78C0.001.DBJJ568-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65cc2,null
U78C0.001.DBJJ568-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b7ca38,null
U78C0.001.DBJJ568-P2-C6-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b7ca39,null
U78C0.001.DBJJ675-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65c40,null
U78C0.001.DBJJ675-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65c41,null
U78C0.001.DBJJ675-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9c6ac0e,null
U78C0.001.DBJJ675-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9c6ac0f,null
U78C0.001.DBJJ675-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65f78,null
U78C0.001.DBJJ675-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65f79,null
U78C0.001.DBJJ675-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000000c9b65e00,null
U78C0.001.DBJJ675-P2-C6-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000
U78C0.001.DBJJ696-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000
U78C0.001.DBJJ696-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,10000
```

Thanks to Nigel Griffiths and Chris Gibson

LMB size

- In order to carry out LPM (Live Partition Mobility)

- Many pre-requisites (see the Redbook)

- LMB (Logical memory Block) size must be the same

- Changing (effective) LMB size requires a power cycle – OF THE ENTIRE SYSTEM

- Choose a size and set all systems to it – now
  - It will become effective at the next power cycle.

LMB size

- Check/change it in asmi

- Check it on the command line

```
hmc11:~ # lshwres -r mem -m plum-8204-E8A-
  SN105C0B0 --level sys -F mem_region_size
128
hmc11:~ #
```

LPM Checklists

- Here are some Checklists for setting up LPM

- **Live Partition Mobility Setup Checklist**

http://www.redbooks.ibm.com/abstracts/tips1184.html?Open

Live Partition Mobility Preparation Checklist

http://www.redbooks.ibm.com/abstracts/tips1185.html?Open

POWER7+ (and beyond) Accelerators

- The command to enable crypto to use the accelerator is:

- acfo -t nx_enabled=0   (disable accelerator)
- acfo -t nx_enabled=1   (re-enable it)

POWER7+ (and beyond) Accelerators - HMC commands

- The following are the HMC commands to disable use of the compression/encryption coprocessors for a partition.

  The disable commands are:

  ```
  chhwres -m <managed system> -r mem -a "hardware_mem_encryption=0" -o s --id <partition id>
  ```
  ·
  ```
  chhwres -m <managed system -r mem -a "hardware_mem_expansion=0" -o s --id <partition id>
  ```

  Expansion used to be called compression, so on an older 760 HMC:

  ```
  chhwres -m <managed system> -r mem -a "hardware_mem_encryption=0" -o s --id <partition id>
  chhwres -m <managed system> -r mem -a "hardware_mem_compression=0" -o s --id <partition id>
  ```

- Replacing the 0 with a 1 will enable the accelerator usage.

- For the change to take affect, the partition needs to be IPL'ed.

How do I know how many Virtual Processors are active?

- It is a common question
  - There is no tool or metric that shows active Virtual Processor count

  - There are ways to guess this, and looking a physical consumption (if folding is activated), physc count should roughly equal active VPs

  - nmon Analyser makes a somewhat accurate representation, but over long intervals (with a default of 5 minutes), it does not provide much resolution

  - For an idea at a given instant, you can use: `echo vpm | kdb`

Be VERY careful with kdb

`# echo vpm | kdb`

```
(0)> vpm
VPM Tunables
vpm_interval............... 000003E8  schedp.vpm_fold_threshold.. 00000050
vpm_fold_limit............. 00000008  vpm_unfold_limit........... 00000002
vpm_be_threshold........... 0000000A

VPM Data
........................vpm_mgmt :01
........................vpm_flags :00
.....................vpm_prev_time :1350612958965291578 ns
.....................vpm_interval :1000636881 ns
....................vpm_prev_intr :6571448426312 ns
........................vpm_intr :1408406 ns
```

Be VERY careful with kdb

```
VPM Core Buckets
INDX  ID    TYPE  SR   CORE  LAST  ACTI  HEAD  UTIL            STATE
   0   0   SYST   1     4     2     2     4         1004877499
   1   4    6     0     0  0  GP
   2   2    6     0     0  0  GP ACTIVE
   3   0    2     0     0  0  GP ACTIVE
                                                   . . .
```

`# echo vpm | kdb`

Be VERY careful with kdb

```
VPM Sleep Data.
.....................vsd_state :01  SLEEP_INITIALIZED
..............vsd_sleep_specifier :00000000
...............vsd_sleep_latency :0000000000000000 sec 00000000 nsec
...................vsd_min_sleep :0000000000000000 sec 1DCD6500 nsec
...................vsd_prod_lock :@F1000A00002E4E00
...................vsd_prod_head :00000000024A9DD0

VSD Thread State.
 CPU VP_STATE    SLEEP_STATE    PROD_TIME: SECS      NSECS      CEDE_LAT

  0  ACTIVE      AWAKE          0000000000000000     00000000   00
  1  ACTIVE      AWAKE          0000000000000000     00000000   00
  2  ACTIVE      AWAKE          0000000000000000     00000000   00
  3  ACTIVE      AWAKE          00000000508069D0     26F6B8F6   00
  4  DISABLED    SLEEPING       000000005080B7E1     0AD9D9B5   00
  5  DISABLED    SLEEPING       000000005080B7E1     0ADAE51C   00
  6  DISABLED    SLEEPING       000000005080B7E1     0ADC2A67   00
  7  DISABLED    AWAKE          0000000000000000     00000000   00


(0)> plum-gaz:/#
```

Resources

www.perzl.org

Index of ftp://www.oss4aix.org/latest/aix71/

Up to higher level directory

Name

a2ps-4.14-1.aix5.1.ppc.rpm			
a52dec-0.7.4-1.aix5.1.ppc.rpm			
a52dec-devel-0.7.4-1.aix5.1.ppc.rpm			
aalib-1.4.0-0.1.rc5.aix5.1.ppc.rpm			
aalib-devel-1.4.0-0.1.rc5.aix5.1.ppc.rpm	58 KB	17/09/2008	00:00:00
aalib-libs-1.4.0-0.1.rc5.aix5.1.ppc.rpm	146 KB	17/09/2008	00:00:00
adns-1.4-1.aix5.1.ppc.rpm	108 KB	19/05/2010	00:00:00
adns-devel-1.4-1.aix5.1.ppc.rpm	14 KB	19/05/2010	00:00:00
adns-progs-1.4-1.aix5.1.ppc.rpm	23 KB	19/05/2010	00:00:00
aget-0.4.1-1.aix5.1.ppc.rpm	14 KB	26/03/2013	12:48:00
agg-2.5-1.aix5.1.ppc.rpm	778 KB	10/03/2011	00:00:00
agg-devel-2.5-1.aix5.1.ppc.rpm	449 KB	10/03/2011	00:00:00
agrep-0.8.0-2.aix5.1.ppc.rpm	11 KB	03/09/2010	00:00:00
analog-6.0-1.aix5.1.ppc.rpm	668 KB	05/05/2011	00:00:00
ansifilter-1.7-1.aix5.1.ppc.rpm	207 KB	30/04/2013	07:17:00
apachetop-0.12.6-1.aix5.1.ppc.rpm	33 KB	16/02/2011	00:00:00
apr-1.4.8-1.aix5.2.ppc.rpm	265 KB	27/06/2013	11:57:00
apr-devel-1.4.8-1.aix5.2.ppc.rpm	490 KB	27/06/2013	11:57:00
apr-util-1.5.2-1.aix5.1.ppc.rpm	227 KB	18/06/2013	21:14:00
apr-util-db4-1.5.2-1.aix5.1.ppc.rpm	12 KB	18/06/2013	21:14:00
apr-util-devel-1.5.2-1.aix5.1.ppc.rpm	260 KB	18/06/2013	21:14:00
apr-util-freetds-1.5.2-1.aix5.1.ppc.rpm	32 KB	18/06/2013	21:14:00
apr-util-gdbm-1.5.2-1.aix5.1.ppc.rpm	12 KB	18/06/2013	21:14:00
apr-util-ldap-1.5.2-1.aix5.1.ppc.rpm	15 KB	18/06/2013	21:14:00
apr-util-odbc-1.5.2-1.aix5.1.ppc.rpm	59 KB	18/06/2013	21:14:00
apr-util-sqlite-1.5.2-1.aix5.1.ppc.rpm	27 KB	18/06/2013	21:14:00
archimedes-2.0.0-1.aix5.1.ppc.rpm	92 KB	08/01/2013	00:00:00
argtable2-13-1.aix5.1.ppc.rpm	2980 KB	09/08/2011	00:00:00

My Open Source packages for AIX and Linux on POWER - Mozilla F

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My Open Source packages for AIX and Linux...   +

www.perzl.org

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Here you find the following stuff:

- Open Source packages for AIX
- Ganglia packages for AIX and Linux on POWER

From Andy Thomas (IBM UK)

- 64k page size

- If you are not doing AMS - use a 64k pagesize - can improve performance by 10%

- ```
  # ldedit -btextpsize=4K -bdatapsize=64K -bstackpsize=64K
  $ORACLE_HOME/bin/oracle
  ```

- Spikey workload on a system with lots of busy LPARs not getting resources
- Set the `vpm_xvcpus` to `-1` disables VCPU folding.

- (If Physical resources are not immediately available - then CPU's won't unfold by default - even if weighting is the same as other LPARs)

- If using AMS - set `maxclient%` and `maxperm%` to 50% or 60%
  - guarantee some "free memory" for AMS to work with
  - Good if LPAR has a 2GB+ EC and is not an NFS server or filesystem based database etc

How to debug NIM problems

- START NIMESIS IN DEBUG MODE
  - To debug nimesis problems on the NIM Master do the following:

- 1. Stop nimesis if it still running:

  ```
  stopsrc -s nimesis
  ```

- 2. Run:

  ```
  export NIMBUG=/tmp/nimesis.log
  ```

  Note: Choose another location for the debug output if you wish.

- 3. Run:

  ```
  touch $NIMBUG
  ```

- 4. Run:

  ```
  /usr/sbin/nimesis -ds
  ```

- NOTE: Please make sure ou keep an eye on /tmp/nimesis.out. The /tmp filesystem can get filled up.

How to debug NIM problems

- LOOKING AT NIMLOG
- The "nimlog" file lives in `/var/adm/ras`.
- nimlog is an alog file. Do the following to make the contents ASCII readable, run:

1. `cd /var/adm/ras`

2. `alog -f nimlog -o > /tmp/nimlog.out`

3. View `/tmp/nimlog.out` with you favourite editor

How to debug NIM problems

- BOOTP PROBLEMS - Make sure you check the following:

- Check if the bootpd is active on the master:

      #lssrc -t bootps

- Check if the bootp entry for the client is correct.

  #more /etc/bootptab

- If you are doing a pull, make sure you enter exactly what is in the bootp entry.

- Kill any run-away bootp processes and start again.

- Make sure that your networking makes sense:

  - gateway is on same network as client
  - if there is a gateway make sure the client and the master are not on the same network
  - if the client and master are on the same net, make sure the gateway is
    - 0.0.0.0
    - or the ip address of the master.

Thanks to Aniket Patel
Technical Computing
(HPC) Services Europe,
CEE & MEA
Ex: Sequent Support

Bootp debugging

- ENABLING BOOTP DEBUGGING

1. `vi /etc/inetd.conf`

   # Comment out the following line:

   `bootps dgram  udp  wait root /usr/sbin/bootpd bootpd /etc/bootptab`

   # Save changes and exit.

2. `refresh -s inetd`

3. `ps -ef | grep bootpd`

   # If it is running, kill the process with a "-15".

   # If it is still running, kill it with a "-9".

4. `bootpd -d -d -d -d -s > /tmp/bootpd.out 2>&1 &`

   # The output will be logged to /tmp/bootpd.out.

Bootp debugging

DISABLING BOOTP DEBUGGING

1. `ps -ef | grep bootpd`
   # Kill the debug bootpd process with a "-15".
   # If it is still running, kill it with a "-9".

2. `vi /etc/inetd.conf`
   # Uncomment out the following line:
   `bootps dgram udp wait root /usr/sbin/bootpd  bootpd /etc/bootptab`
   # Save changes and exit.

3. `refresh -s inetd`
   # bootpd will not show up in the process table until a bootp request is made.

When AIX is out of memory it kills processes

- You can protect things if you want..
  - (AIX OOM) <- out of memory

```
# grep ssh /etc/passwd
sshd:*:202:201::/var/empty:/usr/bin/ksh
# vmo -o nokilluid=202
```

From the man page:

User IDs lower than this value will be exempt from getting killed due to low page-space conditions.

Values:
    Default: 0
    Range: 0 - 4294967295
    Type: Dynamic
    Unit: uid

Tuning:
A value of 0 indicates off. Useful when system is out of paging space and system administrator's processes are getting killed. Either set this tunable to 1 in order to protect specific user ID processes from getting killed due to low page space or ensure there is sufficient paging space available.

Thanks to **Keld Norman**

Senior IT Specialist,
UNIX (AIX), Linux and
Windows

IBM Denmark

Test RSCT connection

- # `/usr/sbin/rsct/bin/rmcdomainstatus -s ctrmc`

```
Management Domain Status: Management Control Points
  I A  0xdac61f3c784c692b  0001  9.137.62.146

I     UP
O     Down
```

Thanks to **Keld Norman**

Senior IT Specialist, UNIX (AIX), Linux and Windows

IBM Denmark

Putty and the shell

- The following instructions describe how to you can automatically configure your home area environment on the Unix server so that the hostname is automatically displayed in your PuTTY terminal window.

  Insert the following lines into your .profile:

  ```
  # Display hostname as PuTTY window title
  echo  "\033]0;`hostname`\007"

  # Reset PuTTy window title when logging off
  trap "$HOME/.logout" EXIT
  ```

  Create a file called '.logout' in your home directory. Add the following lines:

  ```
  tsmlpar:/home/langc > cat .logout
  BLANK=""
  export BLANK
  echo "\\033]0;$BLANK\\007"
  tsmlpar:/home/langc >
  ```

  Make the .logout file executable.

Chris Lang
Celerity UK

Putty with ssh keys
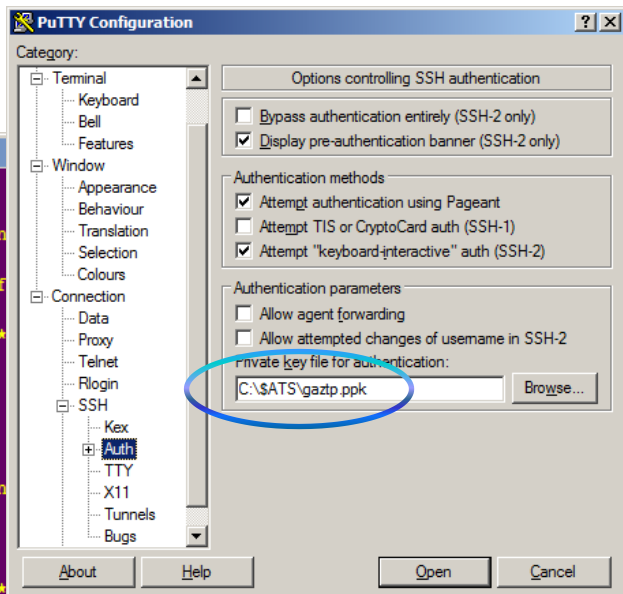
Parallel operations using dsh, distributed shell

- dsh is available on AIX distribution (dsm filesets)
- dsh requires that commands run without prompting for password
- dshbak sorts output by target partitions

```
Setup
      # DSH_LIST=<file listing target partitions>
      # DSH_REMOTE_CMD=/usr/bin/ssh              #If using ssh
      # DSH_PATH=$PATH:/usr/local/bin            #setting paths
```

Morten Vagmo

IBM Norway

Parallel operations using dsh, distributed shell

- >: dsh date

```
nimserver.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
520_deneb.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
stg_mortvag.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
520_altair.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
stg_gold.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
510_vega.oslo.forum.ibm.com: Mon Oct 14 22:33:06 CEST 2013
```

- >: dping -f /home/root/nodes

```
stg_gold.oslo.forum.ibm.com: ping (alive)
510_vega.oslo.forum.ibm.com: ping (alive)
520_altair.oslo.forum.ibm.com: ping (alive)
nimserver.oslo.forum.ibm.com: ping (alive)
stg_mortvag.oslo.forum.ibm.com: ping (alive)
520_deneb.oslo.forum.ibm.com: ping (alive)
```

Parallel operations using dcp, distributed copy

- Using ssh authentication and scp remote command
  - # DCP_NODE_RCP=/usr/bin/scp
  - (# alias dcp='dcp --node-rcp /usr/bin/scp')

- Example
  - # DSH_LIST=/home/root/nodes
  - # dcp /etc/hosts /etc

Chapter 5.2 in AIX7 Diff. Guide:
Distributed System Management
- dsm.core, dsm.dsh filesets
  - dpasswd
  - dconsole
    - dsh
    - dcp

New from AIX 6.1 TL3

IBM

Draft Document for Review September 17, 2010 6:04 pm   SG24-7910-00

IBM AIX Version 7.1
Differences Guide

AIX - The industrial strength UNIX
operating system

AIX Version 7.1 Standard Edition
enhancements explained

An expert's guide to the
new release

Richard Bassemir
Thierry Fauck
Chris Gibson
Brad Gough
Murali Neralla
Armin Röll
Murali Vaddagiri

ibm.com/redbooks

Redbooks

Setting up dsh
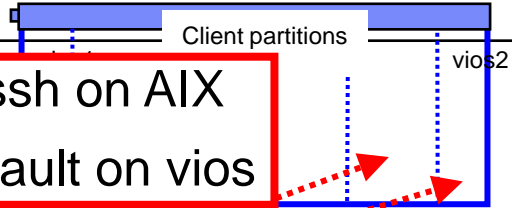
Install ssh on AIX

ssh default on vios

1

2
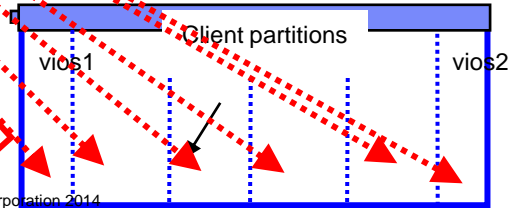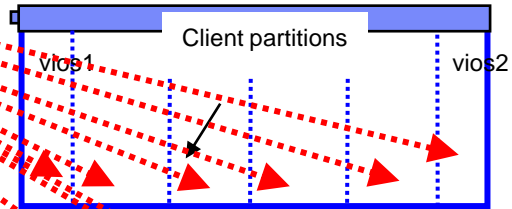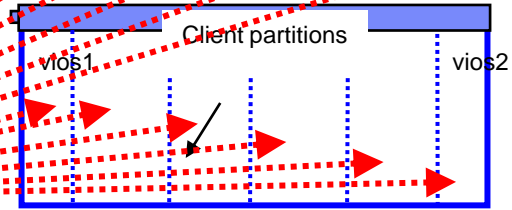
3 dsh date

id_dsa.pub -> authorized_keys2

Client partitions

vios1   vios2

Dawn May's iCan blog

- http://ibmsystemsmag.blogs.com/i_can/
- Regular good tips

Jyoti Dodhia

IBM UK

And, of course, Dawn

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Blog

i Can *Technical Tips for i*

March 26, 2014

IBM i Storage Allocation Perspectives

Quite some time ago, I wrote a blog on Understanding Disk Space Usage. Near the end of that article, I mentioned that Collection Services collects storage usage data in the QAPMJOBMI file.

Late last year, there were additional enhancements to Navigator for i, which included updates to the Performance Data Investigator (PDI). With the Fall 2013 PDI enhancements, you can now visualize these Collection Services storage usage metrics. You will need to install the required PTFs to enable this support, as documented in the "Fall 2013" section of the Performance on the Web information.

You will now find some new charts that will show the storage usage on your system over time.

Dawn May

Tweet

SHARE

Recent Comments

Dawn on POWER and PowerVM Reference Information

bryan dietz on CPF1240 and

The last IPL on an IBM i

- Use the following CL command:

- DSPJOB JOB(SCPF) OPTION(*STSA)

- If older joblogs exists from previous IPL's, you will see a list like this:

```
                           Select Job                        DKIBMASF
                                                    11/08/13  19:33:41
Type option, press Enter.
  1=Select


                                                              Entered
Option Job        User      Number  Type  -----Status----- System
       SCPF       QSYS      000000  SYS   ACTIVE           11/07/13
       SCPF       QSYS      060989  SYS   OUTQ             08/29/13
```

- Then you just select the active one with the 1 and you can see last time the partition was IPL'ed, similar to this:

The last IPL on an IBM i

```
                         Display Job Status Attributes
                                                      System:    DKIBMASF
  Job:  SCPF          User:   QSYS          Number:   000000

  Status of job . . . . . . . . . . . . . . . :   ACTIVE
  Current user profile  . . . . . . . . . . . :   QSYS
  Job user identity . . . . . . . . . . . . . :   QSYS
    Set by  . . . . . . . . . . . . . . . . . :    *DEFAULT
  Entered system:
    Date  . . . . . . . . . . . . . . . . . . :   11/07/13
    Time  . . . . . . . . . . . . . . . . . . :   15:43:33
  Started:
    Date  . . . . . . . . . . . . . . . . . . :   11/07/13
    Time  . . . . . . . . . . . . . . . . . . :   15:43:33
  Subsystem . . . . . . . . . . . . . . . . . :
    Subsystem pool ID . . . . . . . . . . . . :
  Type of job . . . . . . . . . . . . . . . . :   SYS
  Special environment . . . . . . . . . . . . :   *NONE
  Program return code . . . . . . . . . . . . :   0
```

Morten Rasmussen

IBM DK

• So you have the start time of the system.

netstat

- On the command line, type in Netstat <CR>

  1. Work with TCP/IP interface status
  2. Display TCP/IP route information
  3. Work with TCP/IP connection status
  4. Work with IPv6 interface status
  5. Display IPv6 route information
  6. Work with IPv6 connection status

  > options 1, 2 and 3 are the ones used most

- If TCP/IP is up and running, you will get a menu of options.

- If netstat command fails,
  - TCP/IP isn`t running
  - need to do a strtcp <CR>, get a message saying tcp/ip starting.

netstat

- The "trick" is everything you ever wanted to know about tcp/ip on an os/400 is here.

- Another "trick", some applications and firewalls use tcp/ip port numbers, how do you now which ports are active?

- so , netstat <enter> , option 3, shows local port as a name, then F24 for more keys, the F14 display port numbers, if the port number you want isn`t listed then its not started.

Alun P Davies/UK/IBM

HELP!

- Please send in IBM i tips and tricks

Scripting etc

Beep

- In a loop with a sleep:

```
while :
do
echo -e \\007      #Linux
# echo  \\007      #AIX
lssysconn -r all -F type_model_serial_num
sleep 30
done
```

- you get a beep to tell you to look for an update.

vi

- Run a command

    `:!`

- Repeat last command

    `:!!`

- Read next file

    `:n`

- Re-read current file

    `:e %`

- Re-read previous file

    `:e #`

- Rewind

    `:rew`

    `:map lhs rhs`

- eg:

    `:map <CTRL-V><F1> :!ps -ef<CTRL-V><CTRL-M>`

shell

- The cd command:

```
/apps/my-apps/tools/hammer/V1/admin/logs/debug# cd V1 V2
/apps/my-apps/tools/hammer/V2/admin/logs/debug
/apps/my-apps/tools/hammer/V2/admin/logs/debug#
```

- Useful for jumping between different versions etc

- Use hard links

```
peach-gaz:/usr/local/bin# ls -l *hmc*
-rwxr-xr-x  6 root  system  42 07 Aug 2013  blackhmc
-rwxr-xr-x  6 root  system  42 07 Aug 2013  hmc11
-rwxr-xr-x  6 root  system  42 07 Aug 2013  hmc12
-rwxr-xr-x  6 root  system  42 07 Aug 2013  hmc13
-rwxr-xr-x  6 root  system  42 07 Aug 2013  hmc14

peach-gaz:/usr/local/bin# cat hmc14
HMC=$(basename $0)

ssh hscroot@${HMC} $@
```

- Saves disk space
- Edit once

Shell

- Efficient handling of a .tgz
- `gunzip -c  /tmp/backuphdr.tgz | pax -s //./ -r`

- If / filesystem is read only, you can remount it read/write
- `mount -o remount,rw`

- Some variables

```
$$          PID of current shell
$!          PID of last background process
$?          Exit status of last command
$0          The name of the shell
%1          PID of backgrounded job #1
```

Odds

- ksh dry run, very use full to test *postinstall*, *fb_script* syntax on *NIM* server without running it :
  - # ksh -xvn postinstall.ksh

- An old one but still good to know to show *HMC* connections from system :
  - before AIX 6.1 TL 07
    - # lsrsrc -ls IBM.ManagementServer
  - after AIX 6.1 TL 07
    - # lsrsrc -ls IBM.MCP

@chmod666

Odds

- loop mounts

```
loopmount -i /tmp/AIX616_dvd1.iso -m /mnt -o "-V cdrfs -o ro"
loopumount -l loop0 -m /mnt
```

- CPU speed

```
black1:/# pmcycles
This machine runs at 4004 MHz
black1:/#
black1:/# pmcycles -m
CPU 0 runs at 4004 MHz
CPU 1 runs at 4004 MHz
CPU 2 runs at 4004 MHz
CPU 3 runs at 4004 MHz
```

Snippets

A bit of a laugh

Always give 100%

Monday	12%
Tuesday	23%
Wednesday	40%
Thursday	20%
Friday	5%
	100%

**Unix was not designed to stop you from doing stupid things,
because that would stop you from doing clever things.**

Doug Gwyn

- **largesend**
- padmin: $ chdev -dev en10 -attr mtu_bypass=on
- root: # chdev -l en0 -a mtu_bypass=on

Twitter

- Follow these twitterers

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@mr_nmon
@JyotiDodhia
@cgibbo
@NicoletteMcF
@robmcnelly
@ibmaix
@chmod666
@chromeaix
@IBMPureSystems
@IBMPowerSystems
@AIXUserGroup

Nigel's Channel on YouTube

- http://www.youtube.com/user/nigelargriffiths
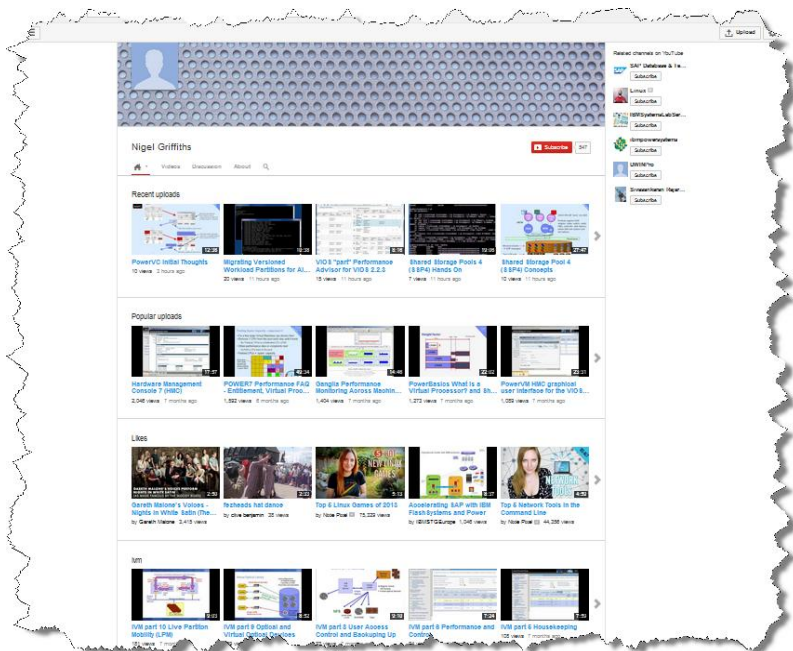
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with Dr Michael Perzl

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