



Today

## Tricks of the Power Masters

Starting at 10:00 am UK time by 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



### Previous Sessions:

Monitoring with ITM  
 Whole Machine Monitoring  
 Electric Server Agent  
 RDX Removable disks  
 Dynamic Platform Optimiser  
 PowerSC  
 POWER Advisors  
 POWER7 Affinity and Perf.  
 Updating Power, I/O & HMC  
 VPM for IBM i  
 ISD VMControl  
 - Capture & Deploy  
 SSP3

### Future Sessions →

- 13<sup>th</sup> Nov - External Storage and IBM i – sizing and modelling
- 4<sup>th</sup> Dec - Power Systems Configuration Best Practices
- Suggestions Welcome



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 Website <http://tinyurl.com/PowerSystemsTechnicalWebinars>



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## IBM Power Systems technical webinar series



### Session 30

Oct 9th 2013, 10:00 - 11:00 (UK time)

# Tricks of the Power Masters

Advanced Technology Support, Europe.



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## Introduction

- Lots of tips and tricks.
  - Hopefully useful
  
- Hardware
- Firmware
- HMC
- VIOS
- AIX
  
- One liners
- Concepts
- Other pointers which may need more research
  - eg: Redbooks

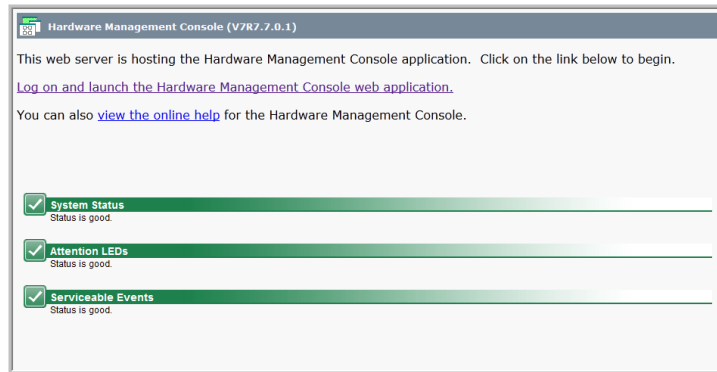
### **DISCLAIMER**

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

## Credits

- The tips here came from many sources
- Personal experience
- Other people, including
  - Nigel Griffiths
    - EMEA ATS
  - Andy Thomas
    - Power FTSS, UK
  - Graeme Penman
    - Power FTSS, UK
  - Paul Chapman
    - SSiS Services, UK
  - Pat O'Rourke
    - Briefing Center (sic), Austin, TX
  - Jay Kruemcke
    - Mr AIX, Austin, TX
  
- And many others – too many to mention

# HMC



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## HMC / Firmware Supported Combinations

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

HMC	p7 System Firmware	p6 System Firmware	p5 System Firmware
V7R7.5.0	AM350_035	EH350_132	SF240_417
	AM350_036	EH350_126	SF240_415
	AM350_037	EH350_120	SF240_403
	AM350_038	EH350_114	SF240_382
	AM350_039	EH350_108	SF240_371
	AM350_040	EH350_102	SF240_358
AH730_030	EM350_030		
AH730_031	EM350_031		
AH730_032	EM350_032		
AH730_033	EM350_033		
AH730_034	EM350_034		
AH730_035	EM350_038		
AS730_103	EM350_132		
AS730_093	EM350_126		
AS730_084	EM350_118		
AS730_086	EM350_108		

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## monhmc - memory

```
monhmc -r mem -n 0
```

```
Mem: 1028512k total, 1009432k used, 19080k free, 142628k buffers
```

```
monhmc -r mem -n 0
```

```
Mem: 4096084k total, 3854460k used, 241624k free, 429908k buffers
```

- That top HMC only manages one POWER7 750, but even so the amount of free memory is low.
- The bottom HMC has 4GB RAM but even so, there's still not much free.

Richard Wale/UK/IBM

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## monhmc - disk

```
monhmc -r disk -n 0
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/sda2	16121184	8591256	6711016	57%	/
tmpfs	2048432	244	2048188	1%	/dev
tmpfs	2048432	0	2048432	0%	/dev/shm
/dev/sda3	6040320	2998696	2734784	53%	/var
/dev/sda7	8056524	1330396	6316876	18%	/dump
/dev/sda8	250104468	191732	237208136	1%	/extra

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## monhmc – proc & swap

```
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, 0.0%sy, 0.0%ni,100.0%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st  
Cpu2 : 0.3%us, 0.0%sy, 0.0%ni, 99.7%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
```

```
monhmc -r swap -n 0
```

```
Swap: 2040244k total,          0k used, 2040244k  
      free, 2354760k cached
```

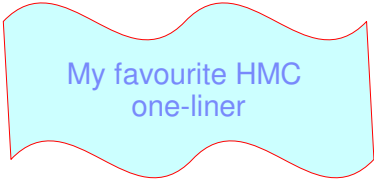
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### HMC

- Scenario:
  - Managed Server is connected to an HMC
  - HMC is “disconnected”
  - HMC is reconnected
  - HMC does not see the Managed Server
  
- If you reconnect the managed system to the HMC after you remove the connection, you must use the `mksysconn -o auto` HMC command to clear the connection history on the HMC before reconnecting the managed system.
- If you reconnect the managed system to the HMC without first using the `mksysconn -o auto` command, the HMC does not recognize the managed system.

## What servers are connected?

```
hmc11:~ # lssyscfg -r sys -F name
bronze-8203-E4A-SN10E0A21
172.17.254.248
pink-9115-505-SN65080EA
silver-8203-SN10E0A31
172.17.255.246
purple-9117-MMB-SN100525P
plum-8204-E8A-SN105C0B0
oldlace-65BD12E
orange-8203-E4A-SN10E0A51
brown-9115-505-SN6509E5A
grey-9117-MMA-p570-8F
hmc11:~ #
```



My favourite HMC  
one-liner

## HMC Password policies

- All as **hscroot**, no need for **root**.

- **Make a new password policy**

```
mkpwdpolicy -i \
"name=gaz4, \
description=, \
min_pwage=1, \
pwage=180, \
min_length=4, \
hist_size=10, \
warn_pwage=7, \
min_digits=0, \
min_uppercase_chars=0, \
min_lowercase_chars=0, \
min_special_chars=0"
```

## HMC Password policies

- All as hscroot, no need for root.

- **Activate it**

```
-chpwdpolicy -o a -n gaz4
```

- **change the password**

```
-chhmcusr -u gaz -t passwd
```

- **disable the policy**

```
-chpwdpolicy -o d
```

- **remove the policy**

```
-rmpwdpolicy -n gaz4
```

# VIOS

## Which VIOS provides your vSCSI

- Run this as root in a client LPAR

```
# print "cvai" | kdb | grep vscsi | grep -v read
vscsi0      0x000007 0x000000000000 0x0 plum-viol->vhost0
vscsi1      0x000007 0x000000000000 0x0 plum-viol->vhost1
#
```

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

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## Security

- Consider the padmin password to be very sensitive
- padmin can gain root privileges
- can then read data from backing devices for all of its clients



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## Don't use smit

- padmin cannot use smit
- smit is available in the oem\_setup\_env environment



## Don't use smit

- padmin cannot use smit
- smit is available in the oem\_setup\_env environment

▪ **DO NOT USE IT !!!**



▪ **Use `cfgassist` as padmin !**

## Create System Plan Failure (mksysplan)

- <https://www-304.ibm.com/support/docview.wss?uid=isg3T1010961>

If the ldc query command fails on the VIO server when run as padmin then there will be additional information about the failures in the `/home/ios/logs/ioscli_ldc.trace` file. However, before you start looking at that file you should first **be prepared to honestly answer the following questions.**

d. Has configuration been performed on the VIO server outside the padmin command line interface (CLI) after exiting the CLI using `oem_setup_env`?

**(1) This tech-note cannot begin to outline the extent of damage well meaning system administrations have inflicted on themselves by performing configuration steps outside of the VIOS CLI command shell.** If the answer is yes to the above question then the least of your worries is system plan and ldc query. You can check the `ioscli_ldc.trace` file to see if you can correct some errors, but the track record other users have had dealing with misuse of `oem_setup_env` is not very promising.

## When to use `oem_setup_env`

- So, what is `oem_setup_env` used for?
- It is an environment to **setup OEM** device drivers
- **ONLY** use it to install these device drivers as directed in the release notes and installation guides.



## What AIX command did that VIO command actually run?

```
$ export CLI_DEBUG=33
$ lsmmap -vadapter vhost0
AIX: "lsdev -c adapter -t IBM,v-scsi-host -s vdevice -F "name" | wc -l -c"
AIX: "lsdev -c adapter -t IBM,v-scsi-host -s vdevice -F "name""
AIX: "lsdev -C -l vhost0 -F "physloc""
AIX: "lsdev -p vhost0 -F "name" | wc -l -c"
AIX: "lsdev -p vhost0 -F "name""
SVSA Physloc Client Partition ID
-----
vhost0 U8233.E8B.100271P-V2-C11 0x00000001

VTD NO VIRTUAL TARGET DEVICE FOUND

$
```

# 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,1000000c9b7cbf0,null
U78C0.001.DBJJ568-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7cbf1,null
U78C0.001.DBJJ568-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6aa32,null
U78C0.001.DBJJ568-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6aa33,null
U78C0.001.DBJJ568-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65cc3,null
U78C0.001.DBJJ568-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65cc2,null
U78C0.001.DBJJ568-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7ca38,null
U78C0.001.DBJJ568-P2-C6-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7ca39,null
U78C0.001.DBJJ675-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65c40,null
U78C0.001.DBJJ675-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65c41,null
U78C0.001.DBJJ675-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6ac0e,null
U78C0.001.DBJJ675-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6ac0f,null
U78C0.001.DBJJ675-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65f78,null
U78C0.001.DBJJ675-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65f79,null
U78C0.001.DBJJ675-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b65e00,null
U78C0.001.DBJJ696-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7d724,null
U78C0.001.DBJJ696-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7d725,null
U78C0.001.DBJJ696-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6abf0,null
U78C0.001.DBJJ696-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6abf1,null
U78C0.001.DBJJ696-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6aefc,null
U78C0.001.DBJJ696-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c6aefd,null
U78C0.001.DBJJ696-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7d652,null
U78C0.001.DBJJ696-P2-C6-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b7d653,null
U78C0.001.DBJJ704-P2-C1-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b
U78C0.001.DBJJ704-P2-C1-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b
U78C0.001.DBJJ704-P2-C3-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c
U78C0.001.DBJJ704-P2-C3-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c
U78C0.001.DBJJ704-P2-C4-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c
U78C0.001.DBJJ704-P2-C4-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9c
U78C0.001.DBJJ704-P2-C6-T1,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b
U78C0.001.DBJJ704-P2-C6-T2,8 Gigabit PCI-E Dual Port Fibre Channel Adapter,null,1000000c9b

```

Thanks to Nigel Griffiths and Chris Gibson

<https://www.ibm.com/developerworks/mydeveloperworks/blogs/cgaix>

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## 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.

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## LMB size

- Check/change it in asmi

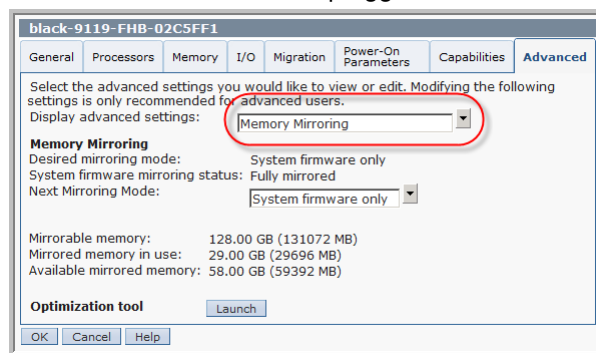
- Check it on the command line

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

## Enable/Disable Hypervisor Memory Mirroring from ASMI

## HMC Mirroring Status

- Advanced Tab on CEC properties
- Desired Mirroring mode
  - Off or System Firmware only
- Option to enable/disable firmware mirroring
- Mirrorable memory
  - Total amount of physical memory that can be mirrored
  - based on the DIMMs that are plugged



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## DPO - Dynamic platform optimiser

- EMEA ATS received a Power 760
  - on loan from Austin, Texas in November 2012.
- The product was not announced till 5<sup>th</sup> February 2013
- I was really keen to test DPO
- I gave feedback to the developers and the following slide shows my headline comments.
- The presentation I sent, (pre-announce) was of course, IBM Confidential, but this one is not.
- It was internal IBM communication, so I could be blunt!



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## DPO - Observations



- Working on DPO has been like reading one of those books that you can't put down!
- Shuffling the VMs (LPARs) by hand, checking the affinity and then watching the optimiser fix it all; has been great.
  - I have certainly consolidated my understanding of POWER7 and POWER7+ LPAR placement and affinity implications
- As the system used for testing is not yet announced, this document is **IBM Confidential**.
  - And that's the only reason that I haven't been tweeting hard about this technology too – **it is really great!**

Now released so no longer confidential!

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## DPO - motivation

- Partition placement can become sub-optimal
  - Dynamic creation and deletion of partitions
  - DLPAR operations
  - Partition Mobility
  - Hibernation
- Platform will provide a mechanism to optimise partition placement dynamically
- Benefits include
  - Improved performance in a cloud environment
  - Dynamically adjust topology after mobility
  - Simple to use and predicted "score"



Think of it as 52 card pickup - and sort

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## DPO – HMC commands

```
# lssyscfg -r sys -F name
zg23ae
zg24he

# lsmemopt -m zg24he -o currscore
curr_sys_score=84

# lsmemopt -m zg24he -o calcscore
curr_sys_score=84,predicted_sys_score=93,"requested_lpar_ids=1,2
,17,105,106,107,108,109,110,111",protected_lpar_ids=none

# optmem -m zg24he -t affinity -o start

# lsmemopt -m zg24he
in_progress=0,status=Finished,type=affinity,opt_id=2,progress=0,
requested_lpar_ids=none,protected_lpar_ids=none,"impacted_lpar
_ids=106,110"

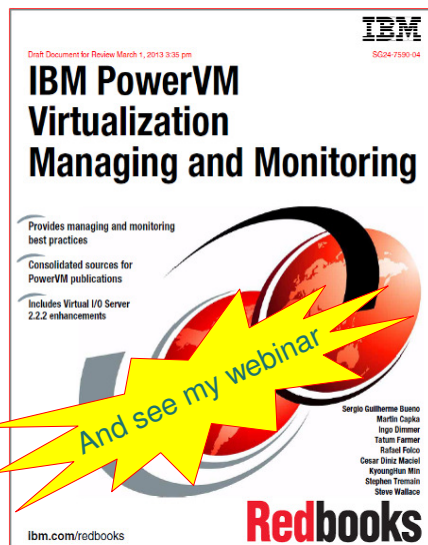
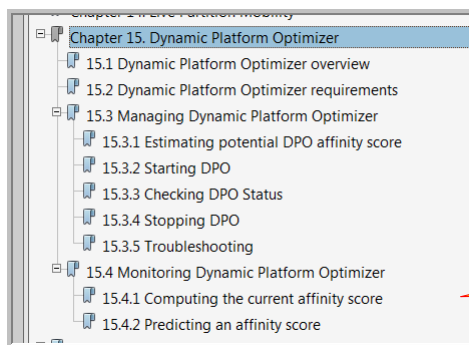
# lsmemopt -m zg24he -o currscore
curr_sys_score=95
```



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## More information

- <http://www.redbooks.ibm.com/redpieces/abstracts/sg247590.html>
- RedBook →
- August 2013 update



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## 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)

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## 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.

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## Power saving mode

- POWER6 and POWER7 can go static Power saving mode – configure this in ASMI

```
# lparstat -E 1 2
```

```
System configuration: type=Shared mode=Uncapped smt=On lcpu=4
mem=4096MB ent=0.40 Power=Static
```

Physical Processor Utilisation:

```
-----Actual----- -----Normalised-----
user  sys   wait  idle  freq          user  sys   wait  idle
----  -
0.002 0.005 0.000 0.393 3.6GHz [ 86%] 0.002 0.004 0.000 0.394
0.003 0.005 0.000 0.392 3.6GHz [ 86%] 0.003 0.004 0.000 0.393
or Power=Disabled
```

## Power saving mode

```
# lparstat -h 1 2
```

```
System configuration: type=Shared mode=Uncapped smt=On lcpu=4 mem=4096MB
psize=4 ent=0.40
```

```
%user %sys %wait %idle physc %entc lbusy vcsw ptime %hypv hcalls %nsp
-----
0.6   4.0   0.0  95.4  0.02  5.1   0.0  181  1   30.3 297  86
0.3   0.9   0.0  98.8  0.01  1.7   0.0  187  1   94.4 333  85
```

**Running at 86% clock speed**

## Power saving mode

- %nsp
- Indicates the current average processor speed as a percentage of nominal speed
- ASMI -> System Configuration -> Power Management Mode Setup Enable|Disable

## POWER7 Power saving

- How fast are my processors actually running?
- pmcycles
- pmcycles -m

## POWER7 Power saving

```
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
CPU 4 runs at 4004 MHz
CPU 5 runs at 4004 MHz
CPU 6 runs at 4004 MHz
CPU 7 runs at 4004 MHz
CPU 8 runs at 4004 MHz
CPU 9 runs at 4004 MHz
CPU 10 runs at 4004 MHz
CPU 11 runs at 4004 MHz
CPU 12 runs at 4004 MHz
CPU 13 runs at 4004 MHz
CPU 14 runs at 4004 MHz
CPU 15 runs at 4004 MHz
black1:~#
```

# Network

## How fast

- To find out the network bandwidth start an FTP session
- then do:

```
put "|dd if=/dev/zero bs=32k count=10000" /dev/null
```

- should get throughput which is almost 95% of the wire-speed
- This works OK for 1Gb/s
- For vEthernet and 10Gb/s FTP may have too much overhead to give valid data

## RMC

- On AIX
- To stop the daemons:  
`/usr/sbin/rsct/bin/rmcctrl -z`
- To start the daemons:  
`/usr/sbin/rsct/bin/rmcctrl -A`
- To enable the daemons for remote client connections (HMC to LPAR and vice versa):  
`/usr/sbin/rsct/bin/rmcctrl -p`

- On HMC

```
hmcshutdown -rt now
```

## RMC

- The whole system can be reinitialized.
- Stops RMC processes and resource managers.  
All ACL files deleted.  
New files are copied from templates.
- Fastest way to fix a broken configuration or to clear out files after cloning.

```
/usr/sbin/rsct/install/bin/recfgct
```

- Also useful if you disconnect an HMC and connect a new one



## WLM (Workload Manager)

- A great tip from Peter Nutt (via Andy Thomas)
- Set up WLM on AIX with default in tier 1 and System in tier 0
- If user process runs away you still get a response on the root prompt to sort it out.
- Also, a very handy WLM command is
- # wlmassign myclass \$\$
- Assigns my process and all my children to "myclass" - handy to put this in the first line of a startup script for job you want controlled by WLM

## smitty mktcpip

```


Minimum Configuration & Startup

To Delete existing configuration data, please use Further Configuration menus

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[Entry Fields]
* HOSTNAME [plum-gaz.aixncc.uk.ibm.com]
* Internet ADDRESS (dotted decimal) [9.137.62.161]
  Network MASK (dotted decimal) [255.255.255.0]
* Network INTERFACE en1
  NAMESERVER
    Internet ADDRESS (dotted decimal) [9.137.62.2]
    DOMAIN Name [aixncc.uk.ibm.com]
  Default Gateway
    Address (dotted decimal or symbolic name) [9.137.62.1]
    Cost [0] #
    Do Active Dead Gateway Detection? no +
  Your CABLE Type N/A +
  START Now no +

F1=Help      F2=Refresh   F3=Cancel    F4=List
F5=Reset     F6=Command  F7=Edit      F8=Image
F9=Shell     F10=Exit    Enter=Do
  
```



## HOSTNAME means FQDN

```

Minimum Configuration & Startup
-----
                                CONTEXTUAL HELP
Type or s|
Press Ent| Press Enter or Cancel to return to the application.
|
| [TOP]
| * HOSTNAM| Specify the host name you want to assign to the current machine.
| * Interne| Enter the host name in the following format:
| Network|
| * Network| host name
| NAMESER|
|          | When specifying the host name, use ASCII characters, preferably
|          | alpha-numeric only. Do not use a period in the host name. Avoid
| Default| using hexadecimal or decimal values as the first character (for
| Ad| example "3Comm," where "3C" might be interpreted as a hexadecimal
| Co| character). The unqualified host name should be less than 32
| Do| characters, for compatibility with older hosts.
|
| Your CA|
| START N|
|-----|
| [MORE...22]
|
F1=Help | F1=Help           F2=Refresh       F3=Cancel
F5=Reset | F8=Image         Enter=Do
F9=Shell |
-----
  
```

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## 911 install

- Boot from Media/NIM etc as normal
- Select console
- Select Language

```

Welcome to Base Operating System
Installation and Maintenance

Type the number of your choice and press Enter. Choice is indicated by >>>.

>>> 1 Start Install Now with Default Settings
    2 Change/Show Installation Settings and Install
    3 Start Maintenance Mode for System Recovery
    4 Configure Network Disks (iSCSI)
    5 Select Storage Adapters

    88 Help ?
    99 Previous Menu

>>> Choice [1]:
  
```

- Enter 911 at this screen. This will enable the install debugging for this session. The screen will refresh, and continue with option 1.

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## 911 Install

```

Welcome to Base Operating System
Installation and Maintenance

Type the number of your choice and press Enter. Choice is indicated by >>>.

>>> 1 Start Install Now with Default Settings
    2 Change/Show Installation Settings and Install
    3 Start Maintenance Mode for System Recovery
    4 Configure Network Disks (iSCSI)
    5 Select Storage Adapters

BOSINST_DEBUG enabled

88 Help ?
99 Previous Menu

>>> Choice [1]: █

```

## 911 install

```

+ ../usr/lib/methods/showled 0xA52
+ Log Initialize_Disk_Environment
+ dspmsg ../usr/lib/nls/msg/C/BosMenus.cat -s 10 37 Initializing disk environme
nt.\n
+ Change Status 0 Initializing disk environment.
Initializing disk environment.
+ LIBPATH=/SPOT/usr/ccs/lib:/SPOT/usr/lib:/mnt/usr/ccs/lib:/mnt/usr/lib:/SPOT/us
r/lpp/xlc/lib:
+ PATH=/SPOT/usr/bin:/SPOT/usr/sbin:/SPOT/usr/lpp/bosinst:/mnt/usr/bin:/mnt/usr/
sbin:/mnt/usr/lpp/bosinst:
+ export PATH LIBPATH
+ [ -n ]
+ + ../SPOT/usr/lpp/bosinst/bidata -i -g image data -f PRODUCT TAPE
PT=yes
+ [ yes = no ]
+ [ yes = no ]
+ [ yes = no ]
+ [ yes = yes ]
+ ETC=/usr/lpp/bos/inst_root/etc
+ DEV=/usr/lpp/bos/inst_root/dev
+ VAR=/usr/lpp/bos/inst_root/var
+ [ -n ]
+ ln -sf /mnt/usr/bin/pwd /usr/bin/pwd
+ 1> /dev/null 2>& 1

```

■ You will get more debug than you could possibly want  
 ■ You will be able to get the text from your PuTTY log ☺

## dfvg

```
p550-gaz:/usr/local/bin# cat dfvg
#
# a noddy script to do dfs for each volume groups
#
lsvg | while read VG
do
echo "disk usage in $VG filesystems: "
lsvg -l $VG| awk ' !/N\|A\|LV\|$VG/ { print $7 }' | xargs df -gP
echo
done
```

## dfvg

```
p550-gaz:/usr/local/bin# time dfvg
disk usage in rootvg filesystems:
Filesystem      GB blocks      Used Available Capacity Mounted on
/dev/hd4         19.75         16.98         2.77         86% /
/dev/hd2          3.25          1.47          1.78         46% /usr
/dev/hd9var       1.00           0.24          0.76         24% /var
/dev/hd3          6.00           4.05          1.95         68% /tmp
/dev/hd1         24.00         16.07          7.93         67% /home
/dev/hd10opt      3.00           0.31          2.69         11% /opt
/dev/hd11admin    1.00           0.00           1.00          1% /admin
/dev/livedump     0.25           0.00           0.25          1% /var/adm/ras/livedump
/dev/lv00         1.00           0.03           0.97          4% /export/installios

disk usage in nimvg filesystems:
Filesystem      GB blocks      Used Available Capacity Mounted on
/dev/export     367.12       357.17          9.96          98% /export
nfs:/export     187.50       185.65          1.85         100% /nfs/export

real    0m0.10s
user    0m0.05s
sys     0m0.01s
p550-gaz:/usr/local/bin#
```

## duvg

```
p550-gaz:/usr/local/bin# cat duvg
#
# a nobby script to estimate disk usage in filesystems in all volume groups
#
lsvg | while read VG
do
GIGS=$(lsvg -l $VG| awk ' !/N/A|LV|$VG/ { print $7 }' | xargs df -gP | sumcol 3)

echo "
    Estimated disk usage in $VG filesystems is $GIGS GB
"
done
```

## duvg

```
p550-gaz:/usr/local/bin# time duvg

    Estimated disk usage in rootvg filesystems is 39.15 GB

    Estimated disk usage in nimvg filesystems is 542.82 GB

real    0m0.14s
user    0m0.04s
sys     0m0.02s
```

## sumcol

```
# SumCol - sum of a column
#
#SYNOPSIS
# SumCol N <data
#
#DESCRIPTION
# Add up column N1 of stdin. If you pipe the output of "ls -l" to
# this, it will add up the sizes, which are in column 4, our
# default. You can specify the column for other kinds of files.
#
#BUGS
# There's a better version available in perl; awk is obsolete.
#
#AUTHOR
# John Chambers <jc@trillian.mit.edu>

if [ $# -lt 1 ];then set 4;fi
awk '{s += '$1'} END {print s}'
```

## Mounting an ISO image in AIX

- Have you ever used loop devices eg: in Linux?
- Do you wish you could do the same in AIX?
  
- Well, why don't you?

## Mounting an ISO image in AIX

- Firstly, we can see that nothing is mounted on /mnt

```
/# mount | grep mnt
```

- Then we mount an ISO image

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

- And we can now see that it is mounted

```
/# mount | grep mnt
/dev/loop0          /mnt                cdrfs  02 Nov 17:54 ro
/# ls /mnt
6100-06      image.data  OSLEVEL  README.aix  RPMS  .Version
bosinst.data installp    ppc      root        usr
```

- Then we can unmount it

```
/# loopumount -l loop0 -m /mnt
/# ls /mnt
/# mount | grep mnt
/# ls mnt
/#
```

## Mounting an ISO image in AIX

- The commands are in the devices.loopback.rte fileset

```
/# type loopmount
loopmount is /usr/sbin/loopmount
/# lslpp -w /usr/sbin/loopmount
File                                Fileset                                Type
-----
/usr/sbin/loopmount                 devices.loopback.rte                 File
/# lslpp -w /usr/sbin/loopumount
File                                Fileset                                Type
-----
/usr/sbin/loopumount                 devices.loopback.rte                 File
/#
```

## Mounting an ISO image in AIX

- So, with loopmount and virtual optical devices,
- You hardly ever need to write media and can do installations, upgrades etc remotely.

# Linux (and AIX)

## rpm

- How to install a new package, or upgrade it if it already exists?

```
rpm -Uvh <package.rpm>
```

- If you have a directory containing updated packages, and you wish to upgrade only the packages currently on your system, run:

```
rpm -Fvh *.rpm
```

- To delete an installed package, run:

```
rpm -e <package>
```

- To list all installed packages in your system, run:

```
rpm -qa
```

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## rpm

- You have installed a package, but don't know what it does, run the following command to find out more about the package:

```
rpm -qi <package>
```

- To list files installed by a package, run:

```
rpm -ql <package>
```

- How to get a-yet-to-be-installed package to give you information about itself and the files it would install:

```
rpm -qilp <package.rpm>
```

- To find out what package a particular file/binary is part of, run:

```
rpm -qf <full path to file and filename>
```

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## rpm

- To find out which files are missing from the RPM database, run:

```
rpm -Va
```

- To verify a package, run:

```
rpm -Vv <package>
```

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

- To compress and rebuild the RPM database, run:

```
rpm --rebuilddb
```

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## 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
- 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.

options 1, 2 and 3  
are the ones used  
most

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## 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

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## HELP!

- Please send in IBM i tips and tricks



13th Nov – External Storage and IBM I  
- sizing and modelling  
- Jana Jamsek

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# Scripting

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## JPG2jpg\_all

```
plum-gaz:/tmp/demo# ls -l
total 0
-rw-r--r--  1 root  system  0 21 Oct 04:12 a.JPG
-rw-r--r--  1 root  system  0 21 Oct 04:12 A.JPG
-rw-r--r--  1 root  system  0 21 Oct 04:12 b.JPG
-rw-r--r--  1 root  system  0 21 Oct 04:12 B.JPG
-rw-r--r--  1 root  system  0 21 Oct 04:12 c.JPG
-rw-r--r--  1 root  system  0 21 Oct 04:12 C.JPG
plum-gaz:/tmp/demo# JPG2jpg_all
plum-gaz:/tmp/demo# ls -l
total 0
-rw-r--r--  1 root  system  0 21 Oct 04:12 a.jpg
-rw-r--r--  1 root  system  0 21 Oct 04:12 A.jpg
-rw-r--r--  1 root  system  0 21 Oct 04:12 b.jpg
-rw-r--r--  1 root  system  0 21 Oct 04:12 B.jpg
-rw-r--r--  1 root  system  0 21 Oct 04:12 c.jpg
-rw-r--r--  1 root  system  0 21 Oct 04:12 C.jpg
plum-gaz:/tmp/demo#
```

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## JPG2jpg\_all

```
for i in $(ls | grep .JPG$ )
do
mv $i ${i%.JPG}.jpg
Done
```

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## to remove a suffix

```
tom:~ # NAME=name.ext
tom:~ # echo $NAME
name.ext
tom:~ # echo ${NAME%.ext}
name
tom:~ #
```

If the pattern matches a trailing portion of the expanded value of parameter, then the result of the expansion is the expanded value of parameter with

- the shortest matching pattern (the ``%" case)
  - the longest matching pattern (the ``%%" case)
- deleted.

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## to strip a prefix

```
tom:~ # NAME=name.ext
tom:~ # echo $NAME
name.ext
tom:~ # echo ${NAME#name.}
ext
tom:~ #
```

If the pattern matches the beginning of the value of parameter, then the result of the expansion is the expanded value of parameter with

- the shortest matching pattern (the ``#" case) or
  - the longest matching pattern (the ``##" case)
- deleted.

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Do you use arrays?

### Korn shell arrays in AIX

```
set -A MACHINES $(ssh hscroot@${HMC} ' lssyscfg -r sys -F name ' )
```

It really is that easy

## Korn shell arrays in Linux (Suse)

```
MACHINES=$(ssh hscroot@${HMC} ' lssyscfg -r sys -F name ' )
```

## That is even easier

```
tom:~ # bash --version
GNU bash, version 3.1.17(1)-release (i586-suse-linux)
Copyright (C) 2005 Free Software Foundation, Inc.
tom:~ #
```

## Korn shell arrays in AIX

## Using the array

```
ELEMENT=0
while [ ${ELEMENT} -lt ${#MACHINES[*]} ]
do
    echo ${ELEMENT} \t ${MACHINES[${ELEMENT}]}
    ELEMENT=$(( ELEMENT + 1 ))
Done

0      bronze-8203-E4A-SN10E0A21
1      172.17.254.248
2      pink-9115-505-SN65080EA
3      silver-8203-SN10E0A31
4      172.17.255.246
5      purple-9117-MMB-SN100525P
6      plum-8204-E8A-SN105C0B0
7      oldlace-65BD12E
8      orange-8203-E4A-SN10E0A51
9      brown-9115-505-SN6509E5A
10     grey-9117-MMA-p570-8F
```



## So what?

POWER Server And LPAR Menu                      Version: 0.56beta

```
0          9.137.62.145    hmc10.aixncc.uk.ibm.com
1          9.137.62.146    hmc11.aixncc.uk.ibm.com
2          9.137.62.210    alex00.aixncc.uk.ibm.com
3          9.137.62.148    hmc8.aixncc.uk.ibm.com
```

Please select an HMC by number: 1

```
0          Select a Managed Server
1          Get information about the HMC
```

Please make a selection: 0

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## So what ..... ?

```
0          bronze-8203-E4A-SN10E0A21
1          172.17.254.248
2          pink-9115-505-SN65080EA
3          silver-8203-SN10E0A31
4          172.17.255.246
5          purple-9117-MMB-SN100525P
6          plum-8204-E8A-SN105C0B0
7          oldlace-65BD12E
8          orange-8203-E4A-SN10E0A51
9          brown-9115-505-SN6509E5A
10         grey-9117-MMA-p570-8F
```

Please select a machine by number: 5

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## So what ..... ?

```
0      Select an LPAR on this Managed Server
1      Get information about this Managed Server
```

Please make a selection: 0

0	purple11-AIX7sp1	21	aixlinux	Not_Activated
1	purple10_RH55	20	aixlinux	Not_Activated
2	purple9_fresh	19	aixlinux	Not_Activated
3	purple8_fresh	18	aixlinux	Not_Activated
4	purple7-AIX7_TL1	17	aixlinux	Running
5	purple6	16	aixlinux	Not_Activated
6	purple5-AIX5	15	aixlinux	Not_Activated
7	purple4-nag-ISD63	14	aixlinux	Running
8	purple3-hpc	13	aixlinux	Not_Activated
9	purple2-nag-ISD63	12	aixlinux	Running
10	purple1-SRAD-test	11	aixlinux	Running
11	mmafull	6	aixlinux	Not_Activated
12	purplevio3	5	vioserver	Not_Activated
13	purplevio2	4	vioserver	Running
14	purplevio1	3	vioserver	Running
15	purple12_IBMi	24	os400	Not_Activated

Please select an LPAR by number: 4

You get the idea .....

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## So what ..... ?

```
purple7-AIX7_TL1,17,aixlinux,Running
```

- 1) List resources
- 2) Activate Normal
- 3) Activate SMS
- 4) Open vterm
- 5) Close vterm
- 6) Shutdown immediate
- 7) Shutdown OS

Please make a selection:

You get the idea .....

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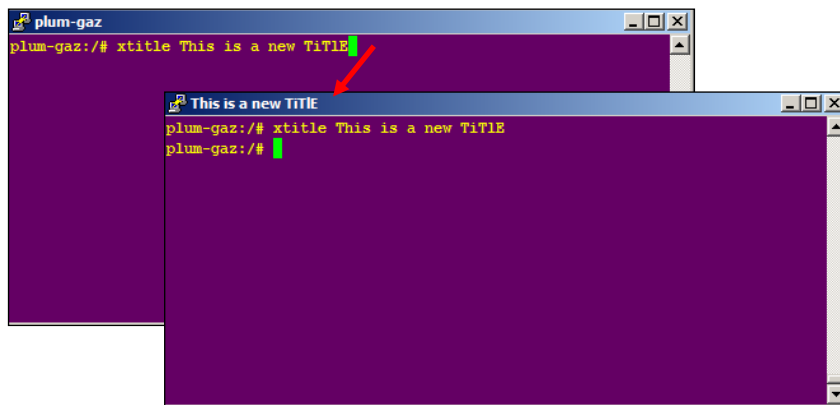
So, here is the *only* configuration file:

```
plum-gaz:/usr/local/lib# cat psalm
9.137.62.145    hmc10          # an HMC 7042-CR5
9.137.62.146    hmc11          # an HMC 7042-CR5
9.137.62.210    alex00         # Alex Abderrazag
9.137.62.148    hmc8           # an old HMC
9.137.62.12     hmc12          # an HMC 7042-CR7

plum-gaz:/usr/local/lib#
```

## xtitle

- # Change title in an xterm window
- `exec echo "\033]1;${@\007\033]2;${@\007\c"`



# Resources

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[www.perzl.org](http://www.perzl.org)

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

[Up to higher level directory](#)

Name	Size	Date	Time
<a href="#">a2ps-4.14-1.aix5.1.ppc.rpm</a>	58 KB	17/09/2008	00:00:00
<a href="#">a52bc-0.7.4-1.aix5.1.ppc.rpm</a>	146 KB	17/09/2008	00:00:00
<a href="#">a52bc-devel-0.7.4-1.aix5.1.ppc.rpm</a>	108 KB	19/05/2010	00:00:00
<a href="#">aalb-1.4.0-0.1.rc5.aix5.1.ppc.rpm</a>	14 KB	19/05/2010	00:00:00
<a href="#">aalb-devel-1.4.0-0.1.rc5.aix5.1.ppc.rpm</a>	23 KB	19/05/2010	00:00:00
<a href="#">aalb-libs-1.4.0-0.1.rc5.aix5.1.ppc.rpm</a>	14 KB	26/03/2013	12:48:00
<a href="#">adns-1.4-1.aix5.1.ppc.rpm</a>	778 KB	10/03/2011	00:00:00
<a href="#">adns-devel-1.4-1.aix5.1.ppc.rpm</a>	449 KB	10/03/2011	00:00:00
<a href="#">adns-progs-1.4-1.aix5.1.ppc.rpm</a>	11 KB	03/09/2010	00:00:00
<a href="#">aget-0.4.1-1.aix5.1.ppc.rpm</a>	668 KB	05/05/2011	00:00:00
<a href="#">agg-2.5-1.aix5.1.ppc.rpm</a>	207 KB	30/04/2013	07:17:00
<a href="#">agg-devel-2.5-1.aix5.1.ppc.rpm</a>	33 KB	16/02/2011	00:00:00
<a href="#">agrep-0.8.0-2.aix5.1.ppc.rpm</a>	265 KB	27/06/2013	11:57:00
<a href="#">analog-6.0-1.aix5.1.ppc.rpm</a>	490 KB	27/06/2013	11:57:00
<a href="#">ansifilter-1.7-1.aix5.1.ppc.rpm</a>	227 KB	18/06/2013	21:14:00
<a href="#">apachetop-0.12.6-1.aix5.1.ppc.rpm</a>	12 KB	18/06/2013	21:14:00
<a href="#">apr-1.4.8-1.aix5.2.ppc.rpm</a>	260 KB	18/06/2013	21:14:00
<a href="#">apr-devel-1.4.8-1.aix5.2.ppc.rpm</a>	32 KB	18/06/2013	21:14:00
<a href="#">apr-util-1.5.2-1.aix5.1.ppc.rpm</a>	12 KB	18/06/2013	21:14:00
<a href="#">apr-util-db4-1.5.2-1.aix5.1.ppc.rpm</a>	15 KB	18/06/2013	21:14:00
<a href="#">apr-util-freetds-1.5.2-1.aix5.1.ppc.rpm</a>	59 KB	18/06/2013	21:14:00
<a href="#">apr-util-gdbm-1.5.2-1.aix5.1.ppc.rpm</a>	27 KB	18/06/2013	21:14:00
<a href="#">apr-util-ldap-1.5.2-1.aix5.1.ppc.rpm</a>	92 KB	08/01/2013	00:00:00
<a href="#">apr-util-odbc-1.5.2-1.aix5.1.ppc.rpm</a>	27 KB	18/06/2013	21:14:00
<a href="#">apr-util-sqlite-1.5.2-1.aix5.1.ppc.rpm</a>	92 KB	08/01/2013	00:00:00
<a href="#">archimedes-2.0.0-1.aix5.1.ppc.rpm</a>	2980 KB	09/08/2011	00:00:00
<a href="#">argtable2-13-1.aix5.1.ppc.rpm</a>			

Here you find the following stuff:

- [Open Source packages for AIX](#)
- [Ganglia packages for AIX and Linux on POWER](#)

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## FLRT

- <http://www14.software.ibm.com/webapp/set2/flrt/>
- Google: FLRT I

**Fix Level Recommendation tool**  
For IBM Power Systems administrators

The following consolidated information is for guidance purposes only. This information was obtained from generally available product support documentation. These combinations of product levels are supported by IBM.

**Date:** 2011.04.05  
**Model:** IBM Power 720 Express (8202-E4B)  
Click [here](#) for the latest device firmware for this model.  
**Clock:** 3.0 ghz.

Your selected levels		
Product	Version/Release	Status
AIX	7100-00-00	
System Firmware	AL720_082	
Virtual I/O Server	2.2.0.10	

**Detailed results**

AIX  
Note: You selected a level lower than the recommended level. The current recommended SP level for this AIX TL is 7100-00-02.

Virtual I/O Server [Get the upgrade](#)  
Upgrade recommended: 2.2.0.11  
VIOS 2.2.0.11-FP-24 SP-01 is the first Service Pack for VIOS 2.2.0.10-FP-24. It is an optional service pack. Do not apply this service pack to any other level of VIOS except Fix Pack 24 (VIOS 2.2.0.10-FP-24).

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## IBM Systems Energy Estimator

- <http://www-912.ibm.com/see/EnergyEstimator>

Estimation

Save configuration + Back  
Generate PDF

**System Information**

	<b>Model:</b> 790-9179-MHB
	<b>Cores:</b> 4 cores of 4-64
	<b>Processor:</b> IBM® POWER7
	<b>Clock speed:</b> 3860 MHz
	<b>Configured Memory:</b> 32 GB

**Energy Estimate**

**Nominal Mode**  
The following estimation was made without enabling any power saver modes. Thus the cores are running at the published frequency and the system capacity is as published. In Active Energy Manager this is described as "no power savings mode." Using Active Energy Manager to specify power saver modes may significantly reduce energy consumption.

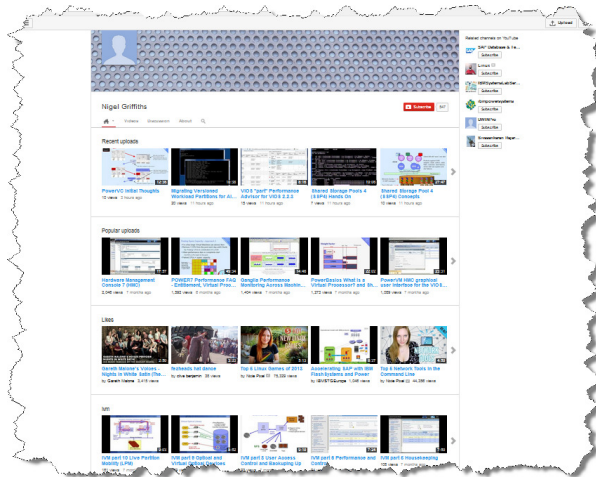
<b>Estimated energy at 50% CPU utilization:</b> 758 Watts 2,588 BTU/hr
<b>Estimated energy at full utilization:</b> 783 Watts 2,673 BTU/hr

Energy Estimate

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## Nigel's Channel on YouTube

- <http://www.youtube.com/user/nigelargriffiths>



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# Snippets

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## snippets

- largesend

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

- “PowerVM Virtualization Managing and Monitoring” RedBook (August 2013 update)

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## mount without logging ( speed up a transfer )

- `mount -o log=NULL /xxxxx`

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## Twitter

- Follow these twitterers



@power\_gaz  
@mr\_nmon  
@JyotiDodhia  
@cgibbo  
@NicoletteMcF  
@robmcnelly  
@ibmaix  
@chmod666  
@chromeaix  
@IBMPureSystems  
@IBMPowerSystems  
@AIXUserGroup

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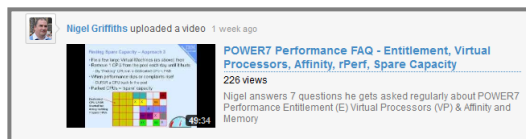
## A couple of good videos

- One old



<http://t.co/cljsVrvjUp>

- One newer



<http://www.youtube.com/watch?v=1W1M114ppHQ>

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## Writing AIX DVDs on Linux

- A command to write DVDs on Linux:  

```
cdrecord -dev=/dev/dvd -dao driveropts=burnfree file.iso
```
- How to use mkisofs so that AIX gets the filenames right:  

```
mkisofs -o ./ISONAME.iso -L -pad -allow-multidot -rock \  
-untranslated-filenames -joliet -rational-rock -force-rr DIRECTORY
```

## FEEDBACK

IS THIS KIND OF SESSION USEFUL?

If so, please send me your tips ...

I will always give **you** the credit 😊



Next Time

13th Nov – External Storage and IBM i –  
sizing and modelling  
- Jana Jamsek



Previous Sessions:  
Monitoring with ITM  
Whole Machine Monitoring  
Electric Server Agent  
RDX Removable disks  
Dynamic Platform Optimiser  
PowerSC  
POWER Advisors  
POWER7 Affinity and Perf.  
Updating Power, I/O & HMC  
VPM for IBM i  
ISD VMControl  
- Capture & Deploy  
SSP3

### Future Sessions

- 4th Dec - Power Systems Configuration Best Practices
- Suggestions Welcome



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Thank you for attending this session!

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