Power System Technical Webinar Series

Power8: from hands-on experience
Starting at 10:00 am UK time by Nigel Griffiths & Gareth Coates

Previous Sessions:
- Power up your Linux
- PowerVC
- PowerVP
- SSP4
- Best Practices
- Tricks of Power Masters
- IBM and External Storage
- Monitoring with ITM
- Whole Machine Monitoring
- Electric Server Agent
- RDX Removable disks
- Dynamic Platform Optimiser
- And more....

Future Sessions:
- 11th Jun: More Tricks of the Power Masters
- Suggestions Welcome

Twitter:
- @power_gaz
- @JyotiDodhia
- @mandieq

Website: http://tinyurl.com/PowerSystemsTechnicalWebinars
YouTube Channel: http://tinyurl.com/IBM-PowerVUCYouTubeChannel

Hands-on with POWER8 - What is it actually like?

Nigel Griffiths & Gareth Coates
EMEA Power Advanced Technology Support

Webinar
21st May 2014
Hands-on with POWER8 - What is it actually like?

Power Systems
Open Innovation to Put Data to Work

Agenda
1. ESP and beta testing life
2. It arrives → pics
3. Unpacking and Physical Install → pics
4. HMC software → demo Properties, 16 core, RAM, I/O
5. Power up → talk
6. Virtual I/O Server 2.2.3.3 & SSP4 → talk
7. Operating Systems → initial testing
8. Which OS “understand” POWER8 = SMT8 ?
   - AIX7 + sp, RHEL7, Fedora
9. LPM → as expected
10. Speed: start/stop, apps → paraworms!
11. PowerVP / PowerVC → not yet but what we expect
12. Beta FW/VIOS/OS → Indicative tests
13. Some new HMC features
2. It arrives → pics

We received the systems …

... in IBM Bedfont Lakes

... moved them to IBM Southbank

... reconfigured all of our server and networking Infrastructure ...

... and started to unpack it.

3. Unpacking and Physical Install → pics

Now the main performer

Good quality Packaging
Better to use the white clips and lift off the lid, rather than using a knife.
3. Unpacking and Physical Install → pics

Rack rails for POWER8 4U

- The first job was to install the rails.
- We found a few problems in the documentation – which we fed back to the ESP team
  - Which rail is which?
  - Hard to see the markings.
  - Tilt to “get the right light”

It looks like a Power server

ESP
Early Support Program
Pre GA field testing
3. Unpacking and Physical Install ➔ pics
3. Unpacking and Physical Install → pics

Some changes expected in PSUs for GA
3. Unpacking and Physical Install → pics

We needed to take it to pieces, well, boys and their toys ....

**Optional SSDs**

The bezel comes off

The operator panel is much better looking than the old one used to be.
3. Unpacking and Physical Install → pics

Good diagrams on the lid
3. Unpacking and Physical Install → pics

The processors and DIMMs have a cover to optimise air flow for cooling

A DIMM  Remove the fan tray to access SAS Raid adapters
3. Unpacking and Physical Install → pics

... insides ...

PCIe slots which are hot swappable

VPD “lollipop”

FSP2 RS232 (RJ45) and two USB

PSU

3. Unpacking and Physical Install → pics

Putting it on the rails

Nail head in slot

Nail head

Clip to release rail

Front Right Rear Left Rear Right
Carefully consider the length of power cords which you order.

You may want two of them to be longer than the other two.

3. Unpacking and Physical Install ➔ pics

We started to cable up and installed the HMC.

- Four power cords
  Plugs do NOT go through brackets
- HMC PSUs
- HMC Network ports
3. Unpacking and Physical Install → pics

We started to cable up and installed the HMC

4. HMC software

- The HMC (7042-CR8) was supplied with software installed 😊
- HMC V7R780 – which does not support POWER8 😞
- So, we upgraded
  - Over the network
  - Not supported at this stage – but it worked 😊
  - We installed the second HMC from media
- Now running:

```
"version= Version: 8
Release: 8.1.0
Service Pack: 0
HMC Build level 20140121.2
HMC Driver FRZ1_1404A (0121) Rev 1.0
", "base_version="V8R8.1.0"
```

We test as many things as possible
5. Power up → talk
The interface is very familiar

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FSP2 can use Gbps

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5. Power up → talk
… and it all seems to work well 😊
To raise the baffle to access the Memory and Processors, push the blue tabs from the front towards the back of the machine.

• Do NOT pull the blue tabs upward!
• The DIMMs and CPUs are not hot swappable so the machine would need to be powered down.
• Lifting the cover is OK as you need to do this to hot swap the PCIe adapters and Air Movement Devices (fans)
• Follow the exchange FRU process via the HMC.

http://tinyurl.com/p8hotswapblog
6. Virtual I/O Server 2.2.3.3 & SSP4 → talk

- Small update to VIOS
- Large update with new function every Q4

- Q2 – support for new FW & adapters only
- SSP4 functions the same – fixed a few documentation errors!

- We are heavy SSP4 users
- Allows total FW, OS and SW refresh then pulling in the same LPARs in 20 seconds.
- Have a SSP between POWER6 and POWER8

7. Which OS “understand” POWER8 = SMT8 ?

1. AIX 7 TL3 with extra SP
   - For POWER8 native adapters
   - SMT=8
   - Interfaces/libraries for apps to compile in
2. RHEL7 public beta
3. SLES 12 private beta
4. Fedora 20
8. OS - initial testing

- nmon on AIX – what else!!
- smtctl – Check SMT=8
- nmon PMR about the PCPU and SCPU filed stats
9. LPM

**Basically, it works! 😊**

1. CLI and GUI
2. POWER6 ↔ POWER8
3. POWER7 ↔ POWER8
4. SSP or Traditional VIOS
5. Support for as many as 16 LPMs in parallel

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10. Speed: start/stop, apps → paraworms

1. LPAR start and stop seems quicker
   - But hard to test

2. As we have full POWER7/7+ support
   - Everything works
   - Rather boring 😊

3. POWER8 mode primary difference is SMT=8
   - Most application are not SMT aware
   - Available in minor SP for AIX
   - Available some Linux only – can’t force synchronous GA
11. **PowerVP / PowerVC**
1. ESP Internal ONLY Beta’s not yet available
2. Always planned for mid April or later
3. What we expect
4. PowerVP
5. PowerVC
   1. Scale
   2. PowerLinux / PowerKVM support
   3. SSP → lots

12. **Beta FW/VIOS/OS → Indicative tests**
Fedora install without dhcp bug

Eventually worked around it
See Nigel’s public AIXpert blog for all the details
“Fun with Fedora”

Note:
Linux on Power blogs get a lot of hits
**Single Thread Performance tested by Worms**

Adjusted for GHz

POWER7+ 3.0 GHz  92 updates per second
POWER8  4.1 GHz  144 updates per second

Conclusions:

- "Wow! POWER 8 single threaded CPU bound workloads really "kick ass" at 56% faster (144/92*100) even allowing for GHz ratings.'

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**SMT=8 tested by paraWorms**

Adjusted for GHz

POWER7+ 3.0 GHz  64 updates per second
POWER8  4.1 GHz  75 updates per second

Conclusions:

- That SMT=8 POWER8 trick has kicked in goes 17% faster
Memory tests

`nmem64 -m 1200 -s 10`
1.2 GB random memory access
Forces real DIMM accesses
POWER8 7.9 million/sec  = 60% faster
POWER7/7+ 4.5 to 5 million/sec

`nmem64 -m 8 -s 10`
8 MB random memory access
Can be cached at L3
POWER8  = 18.1 million/sec  = 63% faster
POWER7+ = 11.1 million/sec

So Jeff Stuecheli gets to keep his job 😊
- Mr Power Memory Architect
Next Time
11th Jun
More Tricks of the Power Masters with Gareth Coates

Future Sessions
Suggestions Welcome

Twitter:
Gareth Coates @power_gaz
Jyoti Dodha @JyotiDodha
Nigel Griffiths @mr_rmon
Mandie Quayle @mandieq
Website: http://tinyurl.com/PowerSystemsTechnicalWebinar
Youtube Channel: http://tinyurl.com/IBMPowerUKYouTubeChannel