Power Systems

Today

Tops Tech Tips from the field
Starting at 10:00 UK time by Tom Watts
90 min session

IBM Meetings → Put questions into the Chat box
or Toll Free phone for better audio
- 0800 279 6716= UK Toll Free
- 020 7660 2093 = UK but you pay for the call
- Then 93505484# Participant Code
- Other countries ibm.biz/globalaccessnumbers

AIX **Linux** **i for Business**

Previous Sessions:
LPM/SRR Automation Tool
PowerVC 1.3.1 update
IBM i Mobile Access
Application Runtime Expert
Hands-On with AIX7.2
Accessing IBM i Now/Future
PowerVC New Features
Boost IBM i perfm with Flash
Simplified Remote Restart
Linux on POWER Field Exp
POWER8 E850 from exper
PowerSC Tools for IBM i
And more…..

Future Sessions →

- Date TBD - The latest with HMC (V8R850 incorporating vHMC)
- 16th Nov - IBM i Performance Data Investigator - TBC
- More being planned….
- Suggestions Welcome

Webinar wiki: http://tinyurl.com/PowerSystemsTechnicalWebinars
Youtube Channel: http://tinyurl.com/IBMPowerVUGYoutubeChannel

Twitter:
Gareth Coates @power_gaz   Nigel Griffiths @mr_nmon
Jyoti Dodhia @JyotiDodhia   Therese Eaton @tetweetings

Top Tech Tips from the field

A number of tips learned and shared from the field

Thomas Watts, Senior Technical Consultant, IBM Lab Services
7th September 2016

IBM

Introduction

Hello and welcome to this Top Technical Tips session!

The tips and information presented are primarily guidance to aid all customers with a successful installation of the latest IBM Power Systems.

Please keep all questions until the end of the session when there will be time to go through them.

There will be polls that will appear after some of the tips it is just informal information to help better understand where customers are with planning, projects and other items. You do not have to vote but it would be appreciated if you could.

The Tips

Firmware

- Always download the latest firmware available for all components of an IBM Power solution from the Fix Central website.

- Apply firmware updates at least once per year and schedule in an outage maintenance window to allow for frame or adapter restarts if required.

- Ensure that operating system patches are taken into consideration when applying firmware as there can be minimum service pack / cumilative pack levels required.

- If applying firmware with operating system patches then perform the updates in the following order to avoid problems:
    - Operating System patches first
    - HMC patches second
    - Platform firmware third
    - Adapter firmware last

HMC Firmware Screen

Updates

HMC Code Level

Version: 8	Build Level: 20160516.1	Serial Number:
Release: 8.5.0	Base Version: V8R8.5.0	Model Type:
Service Pack: 0		BIOS: D7E120CUS-1.20
Additional Info		

Update HMC

System Code Levels

Filter | Tasks ▼ | Views ▼

Select ∧	Name	Status		Platform IPL Level ∧	Activated Level ∧	EC Number ∧	Deferred Level ∧
☐	p520-R6-8203-E4A-:		Operating	159	159	01EL350	
☐	p710-R5	⚠	Operating	142	142	01AL730	
☐	p720-Grasshopper	⚠	Power Off		FW770.41 (92)	01AL770	
☐	p720-Ladybird		Operating	FW770.51 (101)	FW770.51 (101)	01AL770	
☐	p720-Woodhouse	⚠	Operating	FW770.41 (92)	FW770.41 (92)	01AL770	
☐	p740-R5	⚠	Operating	142	142	01AL730	
☐	S824-R6-U14	⚠	Operating	FW840.11 (87)	FW840.11 (87)	01SV840	
☐	S824-R6-U18	⚠	Operating	FW840.11 (87)	FW840.11 (87)	01SV840	

Max Page Size: 500   Total: 8   Filtered: 8   Selected: 0

- The above example HMC screen shows multiple Power7 and Power8 servers all running a variety of firmware levels. Check here for any deferred updates that need to be applied before updating the system firmware.

- Always check what level of firmware you are running here then go to the Fix Level Recommendation website and check what you should be aiming to be running.

- This information is also captured by HMC Scanner.

- A quick poll is next…

Platform Settings

- In most Power8 servers there is a setting in the Service Processor that enables I/O Adapter Enlarged Capacity. This setting pre-allocates larger amounts of DMA memory than normal to an adapter for use by an operating system to perform bulk data transfers using less i/o operations.

- AIX and IBM i (at the time of writing) do not support the use of the I/O Adapter Enlarged Capacity setting and will ignore this when running, however the extra memory will still be pre-allocated for the adapters and will reduce the overall available memory for logical partitions and should be disabled. Linux does support this setting and can gain performance benefits from using it.

Shown here is the ASMI menu item on a running S824 server. This shows 4 possible PCIe slots that can have the setting enabled but to change this you need to power off the system.

I/O Adapter Enlarged Capacity

Enlarged IO Capacity Slot Count for Node 0 : 4 ⓘ

Note: The system needs to be powered off to change any settings.

Platform Settings

- Introduced in earlier POWER systems there is a Power Management setting available which allows you to control the speed and energy used by the processors.

- The default value for this setting has changed over the years but generally it is set to either 'balanced' or 'powersave' mode. If this is not changed then the system will throttle the processors to maintain a lower level of energy use compared to the processors running at full speed.

- It is advisable to review this setting and change it to Dynamic Power Saver (favor performance) or in the case of the E880 systems possibly the Fixed Maximum speed value – both settings will allow the processors to run at full speed, and in the case of the Dynamic setting, slightly overclock cores if the heat and energy use permits.

Power Mode Setup

Current Power Saver Mode : Disable Power Saver mode

- ● Disable Power Saver mode ⑦
- ○ Enable Static Power Saver mode ⑦
- ○ Enable Dynamic Power Saver (favor power) mode ⑦
- ○ Enable Dynamic Power Saver (favor performance) mode ⑦
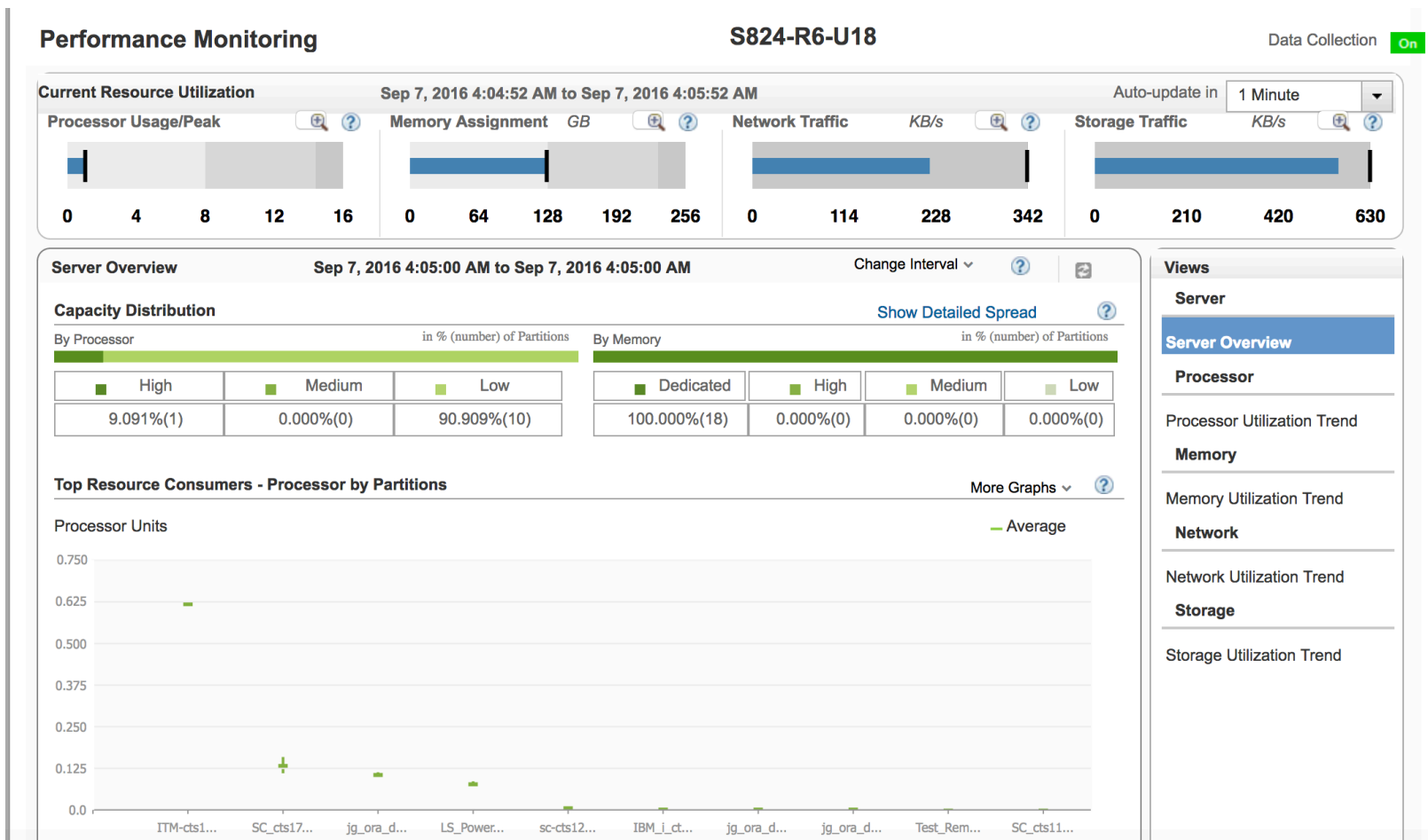- ○ Enable Fixed Maximum Frequency mode ⑦

HMC Settings

- Collect Performance Metrics! By default all performance data collection is disabled but it is a very useful tool for monitoring and troubleshooting reasons. Enabling performance data collection is performed on a server by server basis and the number of days historical data an be adjusted – the default is 365 days.

- The data can show trends in processor, memory, network and disk utilisation and the time range can be from the last 4 hours or longer and the time frame can be chosen via the 'custom' interval setting.

- The HMC interface for viewing the performance data was updated in the 8.8.4 and 8.8.5 HMC code and uses the newer HMC web interface rather than the classic one.

Performance Data Collection

Virtual I/O Server Settings

- Enable large receive on shared ethernet adapters. It pays to check that this flag is set on as well as large send as this helps the performance of each shared ethernet adapter in a VIOS partition.

- Use the VIOS Advisor tool, built in command 'part', and use it before and after maintenance windows / changes as this captures the essential VIOS settings and shows whether they are configured appropriately.

- When configuring disks or adapters for storage provision to client partitions always create a slot numbering system to make problem determination and also implementation easier to understand. Also separate root volume group disks / load source disks away from other storage using separate adapters (vscsi or NPIV).

- Change fibre adapter settings to enable better performance, the defaults are quite restrictive and can throttle partition performance considerably. Sensible values for num_cmd_elems and max_xfer_size would be 4096 and 0x400000 and then monitor performance.

Virtual I/O Server Advisor

System - Configuration

Name	Value
Processor Family	Architecture PowerPC Implementation POWER7_COMPAT_mode 64 bit
Server Model	IBM 8286-42A
Server Frequency	3525.0 MHz
Server - Online CPUs	2.0 cores
Server - Maximum Supported CPUs	8.0 cores
VIOS Level	2.2.3.50
VIOS Advisor Release	0.1

VIOS - I/O Activity

Name	Value
Disk I/O Activity	Average : 4 @ 4.98 KB Peak: 60 @ 25KB
Network I/O Activity	[Average Send: 2 @ 0.7 MBps , Average Receieve: 2 @ 0.2MBps] [Peak Send: 2 @ 0.9 MBps , Peak Receive: 2 @ 0.3MBps]

VIOS - Disk Adapters

Risk/Impact 1=lowest 5=highest

	Name	Measured Value	Suggested Value	First Observed	Last Observed	Risk	Impact
i	FC Adapter Count	2		11/19/2015 12:23 PM			
i	FC I/O Operations per second	0 @ 0 KB		11/19/2015 12:23 PM	11/19/2015 12:33 PM		
✔	FC Adapter Utilization	optimal					

VIOS - Processor

Risk/Impact 1=lowest 5=highest

	Name	Measured Value	Suggested Value	First Observed	Last Observed	Risk	Impact
✔	CPU Capacity	0.5 ent		11/19/2015 12:23 PM			
i	CPU consumption	Average:0.7% (cores:0.1) High:4.0% (cores:0.1)		11/19/2015 12:23 PM	11/19/2015 12:33 PM		
i	Processing Mode	Shared CPU, (UnCapped)		11/19/2015 12:23 PM			
✔	Variable Capacity Weight	255		11/19/2015 12:23 PM			
✔	Virtual Processors	2		11/19/2015 12:23 PM			
✔	SMT Mode	SMT4		11/19/2015 12:23 PM			

System - Shared Processing Pool

Risk/Impact 1=lowest 5=highest

	Name	Measured Value	Suggested Value	First Observed	Last Observed	Risk	Impact
✔	Shared Pool Monitoring	enabled		11/19/2015 12:23 PM			
i	Shared Processor Pool Capacity	24.0 ent.		11/19/2015 12:23 PM			
✔	Free CPU Capacity	average_free:24.0 ent. lowest_free:23.7 ent.					

An example of output from the 'part' command.

A quick poll next….

Documentation

- Use the HMC Scanner application to collect many configuration and operating metrics and save it to a very handy spreadsheet.

- Create and export from the HMC System Plans, very useful for rapid re-creation of all partitions and settings.

- Use the Virtual I/O Server 'part' command to capture the running configuration settings of the VIOS itself and also adapter utilisation data for reference.

- Use the HMC performance data collection pages to view and export historical data for troubleshooting purposes.

- Try out the newer version of the web interface!

Useful Web Links

- IBM FixCentral Web Site (for firmware and operating system patching):
  - http://www.ibm.com/support/fixcentral

- IBM Fix Level Recommendation Tool (for checking firmware compatibility across POWER devices and operating systems):
  - http://www.ibm.com/support/customercare/flrt

- Automated support emails (contains regular update information):
  - http://www.ibm.com/support/mynotifications

- IBM Supported Code/Firmware Matrix (useful to check all components are up to date and work together):
  - https://www-304.ibm.com/support/customercare/sas/f/power5cm/supportedcodep8.html

Thank you!

Questions?

watts1t@uk.ibm.com

Power Systems

Next Time

16th Nov – IBM i Performance Data Investigator (PDI)
TBC

i for Business

Previous Sessions:
LPM/SRR Automation Tool
PowerVC 1.3.1 update
IBM i Mobile Access
Application Runtime Expert
Hands-On with AIX7.2
Accessing IBM i Now/Future
PowerVC New Features
Boost IBM i perfm with Flash
Simplified Remote Restart
Linux on POWER Field Exp
POWER8 E850 from exper
PowerSC Tools for IBM i
And more…..

Future Sessions →

- Date TBD- The latest with HMC (V8R850 incorporating vHMC)
- More being planned….
- Suggestions welcome

Webinar wiki: http://tinyurl.com/PowerSystemsTechnicalWebinars
Youtube Channel: http://tinyurl.com/IBMPowerVUGYoutubeChannel

Twitter:
Gareth Coates @power_gaz   Nigel Griffiths @mr_nmon
Jyoti Dodhia @JyotiDodhia   Therese Eaton @tetweetings